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Association of Indian Management Schools

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Prof (Dr) Upinder Dhar
Chairman, Editorial Board

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Editorial

No Remedy is Without Pain

The problems of nonproductive conflict rarely exist in isolation. It is likely that such conflict is endangered by organizational and emotional maladjustments, each of which affect each other. To address interdepartmental problems one must realize that they may be spun into the warp and woof of the organization's fabric. It means, for example, that the goals of the organization must be critically examined, since these tend to influence the way in which the work of the organization has been divided and division of labour is at the core of interdepartmental problems.

Goals being influenced by the organization's environment and by the way in which that environment is interpreted by executives and directors, the environment and the process by which it is interpreted also must come under scrutiny. Do those in control have a clear idea of their company's relation to its market? If not, why not? Have they made clear to the other members of the company the job to be done?

These questions are fundamental to the building of an organization. Without answers to these questions, any attempt to resolve an illegitimate authority problem usually is a patch-up job, likely to create as many problems as it cures. Furthermore, without these answers, the employees cannot avoid feeling that their relationship to each other is ambiguous, and aimless ambiguity is a breeding ground for insecurity, defensive behavior, and sapped energy.

Involving the members of an organization in the pursuit of clarifying the organization's goals, and establishing a meaningful identity of the firm is, perhaps, the robust process for tapping into the walls of productive energy. Such a pursuit, carried on openly and sincerely, cannot help but raise issues of interdepartmental ambiguity, illegitimacy, and conflicting points of view to a level where they can be re-examined and dealt with. Is it an easy process? Not at all, but as widely believed, no remedy is without pain.

The dynamics of intergroup conflict has been the subject of a number of studies, primarily focusing upon the characteristics of racial and religious discrimination and stereotype. Very little systematic research has been reported at the microscopic level on small group interactions within business, educational, philanthropic, or social organizations. Furthermore, very little experimentation designed to ascertain some of the conditions for reduction of intergroup conflict has been undertaken. Some researchers have reported the results of the experiments demonstrating the

reduction of intergroup conflict by the introduction of superordinate goals, which are the goals that are compelling as well as highly appealing to the members of two or more groups in conflict but which cannot be attained by the resources and energies of the groups separately. The groups cooperate in the activities leading to the accomplishment of common goals, and over time, these joint activities reduce conflict between the groups.

The readers of AJM are requested to go through the contents of the journal and help us in improving the academic value of this publication by offering suggestions based on their critical review and constructive observations. The prospective contributors to this journal are advised to follow APA pattern (latest Edition) for presenting the references.

Prof (Dr) Upinder Dhar
Chairman
Editorial Board – AJM

A Study of Key Innovation Drivers in Education and IT Sectors

Sandeep Kumar*, Upinder Dhar**

Abstract

Organizations the world over recognize innovation as an inescapable need to sustain and grow. Businesses encourage new ideas and provide better environment for idea generation. With rapid advances in technology, particularly in IT (Information Technology), organizations have accelerated their initiatives and innovations by leveraging the digital space. Businesses also resort to better knowledge management practices to share experiences and skills, integrate knowledge, and generate new knowledge. This study is based on primary data collected from leading industry professionals through an online questionnaire. In this study three drivers of innovation are explored, namely, strategic management, idea generation and knowledge & technology innovations. This research is aimed to measure these three drivers of innovation in the Education and IT sectors. It also establishes the predominant innovation driver among the three in their respective industry. In addition, this study establishes the relative significance of the drivers in the two industry sectors under consideration.

Keywords: Idea Generation, Knowledge and Technology, Strategic Management.

Introduction

Innovation is accepted as critical to the advancement and the survival of any progressive organization. And in the relentless pursuit of competitive advantage, businesses have a renewed focus on innovation. Zahra and Covin (1994) very aptly state that "Innovation is considered the life blood of corporate survival and growth". Decision makers and senior management are now, more than ever, exploring and encouraging newer ways to be more innovative. Organizations today acknowledge innovation as a key policy and strategic issue. In that respect, innovation management is undoubtedly gaining prominence as a top strategic management focus for business advancement.

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Innovation which was largely considered the result of scientific Research & Development (R&D), has now come to be accepted as new ways of working, augmented delivery, customer insight, changed services, etc. Innovation by its nature has a fuzzy understanding as it transcends many boundaries and domains and there is a diverse contrast in the understanding and interpretation of innovation. But common one thing is that innovation in any way should help us enrich our ways of working with the realization of new ideas. The goal of each innovation is to develop something distinct from what we have been doing earlier. Furthermore, it is important to mention that it is not sufficient to just create and germinate an idea. That idea needs to be put to effective use for it to be significant enough to change the way we operate for the betterment.

The application of fresh knowledge to produce a new product or service that customers desire or need is referred to as innovation. Innovation is nothing but an improvement, which offers a competitive advantage in the market. Ideally any innovation should help to reduce costs, improve efficiency, increase output, save effort and time, etc. Simply put, innovation is realization of a new idea, product or process and can also be viewed as the implementation of improved solutions to meet new or existing requirements. It basically extends or improves the way we currently operate.

Thus, it is important to note that innovation is a combination of creativity, invention and productization. Also, there are various phases of innovation, such as idea creation, opportunity identification, analysis of future value and acceptability, development of the core idea, garnering support, driving the innovation process, releasing the product / service, ensuring value delivery and consumer acceptance, etc.

In that respect knowledge is key to generate new information which could be either technological or non-technical in nature. Businesses have accordingly focused on enhancing their ability to encourage new ideas and provide better environment for idea generation. There is also a yearning in progressive organizations to link knowledge management and the innovation process. This, it is believed, will help drive creativity within organizations and expedite innovations. Broadly, knowledge management involves two essential areas: 'managing existing knowledge' and improving the ability to develop 'new knowledge.' Technical knowledge or technological knowledge is related to technology, products and processes that contribute to an outcome. Technology (and particularly IT) in organizations has accelerated the pace of transformations and changed the landscape of initiative outcomes. Digitalization has proliferated in almost every sphere of our operations emerging as one of the key drivers of innovation.

As stated above, no matter how creative and novel it may be, any innovation cannot be considered successful unless it yields the desired or envisaged benefit. For that to happen, innovation must be incorporated into the managerial system process of planning, execution, and other strategic aspects to make it flourish. AG Lafley, the CEO of Procter and Gamble, in an interview to Paul Michelman, Harvard Business Review in 2008, explained that his company not only encourages and thrives on innovation, but also manages innovation. He said that they have a very strong focus of aligning innovation and integrating it with their business goals and strategy. Strategic management innovation can be regarded as a fundamental dimension in the domain of business planning and strategy conceptualization and its implementation. It helps reorient the ways in which firms operate or cater to its stakeholders. Strategic innovation in that sense of business planning concept represents 'value impetus'.

Innovation: Creativity, invention and innovation are often mentioned together, sometimes interchangeably, because of their obvious interrelationship. While creativity refers to the act of conceiving something original or unique, invention is the creation of something new that has never been made before. An invention can be a product, device or method that never existed before. Innovation is the process of translating those ideas or invention into goods or service to create value. In general terms, innovation could be related to a new idea, device, or process. Innovation can also be viewed as the application of better solutions to meet new requirements or even existing market needs. The key to effective innovation management depends on the perspective with which an organization views it. Innovation is largely understood and related to ideas, novelty, R&D activities, which are all 'input' related. Also, innovation success is viewed with 'output' related outcomes such as number of patents, new products, services, etc.

Albaladejo and Romijn (2000) opine that "innovation capability can be evaluated based on two categories: input measures and output measures". "Input measures evaluate how the innovation activities have been arranged and how resources are allocated to them", Saunila and Ukko (2012). They mention that "input measures indicate the effort or quantum of resources allocated to the process. Input measures do not however throw light on the result of the effort." This implies that only input measures alone are not a correct reflection of the success or failure of innovation. Further they argue that product patents and specific licenses are relevant only to specific types of organizations. These output measures, even in this type of organizations, are good measures for particular type of innovations. So, innovation capability of an organization is also not truly reflected by only output measures.

Tura et al. (2008) endorse this view and acknowledge the difficulty to quantitatively express all kinds of innovations. They further elaborate that output measures alone are indicative of only innovations that are successful. And input measures which include support for ideas and funds for R&D are ill equipped to indicate innovation outcomes. This brings us to an interesting juncture of deciphering the most appropriate means for establishing the contribution of innovation. While there is consensus that many factors lead to innovation, the contribution of each element and their relative significance varies. This will depend on many factors which may vary, from the type of innovation to the type of industry, to the size of organizations, etc. Despite the complexity, there are some common elements across organizations which can be termed as drivers for innovation. These innovation drivers seem to have direct and indirect contribution to the innovation outcome.

Gupta and Trusko (2014) mention that the PA Consulting Group identified nine dimensions, which the group used to measure an organization's innovativeness:

- a. Committed leadership
- b. Clear strategy
- c. Market insights
- d. Creative people
- e. Innovative culture
- f. Competitive technologies
- g. Effective processes
- h. Supportive infrastructure
- i. Managed projects

Similarly, Adams et al. (2006) "designed a framework for the measurement of innovation management. The framework consists of seven categories: inputs, knowledge management, innovation strategy, organization and culture, portfolio management, project management, and commercialization. In total there are 19 measurement areas in the framework." As can be seen, there is a combination of subjective and objective criteria which are considered as elemental drivers of innovation.

Kaplan and Norton (2004), in their paper, provide a strategy map for organizations to create value. In their approach, they have considered 'innovation process' as an important internal factor, support the view to have both input and output measures for consideration of innovation capability of an organization. Thus we note that diverse elemental drivers for innovation are indeed considered favourably contributing to the innovation cycle and outcome. These essentially relate to ideas, creativity, open culture, trust, conducive policies and environment, knowledge, processes, strategy (and leadership support), investments (financial and human capital), risk, technology, and market needs, etc.

Among the many definitions of innovation there is a common thread which binds a few aspects related to innovation. The first and foremost is the concept of an 'idea'. Idea generation is thus a key component or driver of innovation. Becker and Whisler (1967) defined innovation as "the first or early employment of an idea by one organization or a set of organizations with similar goals." This view of innovation as early as 1967, very clearly links idea generation and its realization for objective achievement. Similarly, Amabile et al. (1996) had defined innovation as "successful implementation of creative ideas within an organization." The other predominant aspect emerging from these definitions is about implementation or realization of the ideas.

Idea Generation: The likes of Thomas Edison, Marie Curie, and Albert Einstein were inspired not by chance, but through a systematic thought process, immense knowledge, and unique thinking approach. In his research du Plessis (2007) discusses innovation as 'the creation of new knowledge and ideas to facilitate new business outcomes, aimed at improving internal business processes and structures and to create market driven products and services.' Idea generation as a methodical process is frequently accompanied by innovation and continuous improvement. It is important to note that the creative idea can further lead to an innovation but that requires expertise in the given field to make it successful. Björklund & Eloranta (2008), in their paper, mention that 'while general knowledge can suffice for creative behaviour, true innovations are unlikely to occur without domain-specific expertise'. This is significant for organizations desiring to be innovative as they need to go beyond the brainstorming phase to encourage and harness creativity and leverage it into innovation.

An organized process can augment the creative genius and have better outcomes in the development of ideas. More and more businesses are aspiring for an innovative culture and deploying innovation managers (business excellence, innovation clubs,

etc.) to encourage generation and development of ideas. It can be accomplished through deep understanding, consumer interviews or trend analysis. The new concepts are optimized with an implementation strategy and then brought to life.

Strategic Management Innovation: There are usually enormous investments and therefore high risks in the innovation journey. This calls for deliberate planning based on well-crafted strategy. Najmaei (2012) in his research findings suggests the need for an entrepreneurially strategic mindset for capitalizing on innovation in a strategic manner. This he feels will help evolution of strategically relevant business models which are much better aligned to the market conditions and thus providing a competitive edge to businesses. He argues that strategic innovation is built on latent unexplored customer needs in the form of a revolutionary plan which is aimed to extract profit from untapped markets. This concept is part of the modern strategic management discipline.

Strategic management innovation considers strategy to be a revolutionary innovative process. Simple innovations (when related to either process or products) are highly vulnerable to replication and duplication by competition, usually in the commodity arena. Najmaei (2012), concludes that strategic management innovation involves managerial system of planning, executing, and evaluating strategic endeavors and is highly complex. Accordingly, it is less susceptible to imitation and replication, thus implying a competitive advantage in business.

Eveleens (2010) opines that innovation management has wide coverage in scientific and management literature of more than 4 decades. This is most likely because innovation is viewed as a means for survival of any organization. He points out that there is difference of considerations of innovation parameters and applicable models in different sectors. This interesting observation gives rise to a consideration for assessing innovation drivers in different industry sectors.

Knowledge and Technology Innovations: Information (gleaned from data), experience and the interpretation of that information, including personal experiences are the fundamental building blocks of knowledge. Knowledge, according to Davenport and Prusak (2000), is a fluid mix of framed experience, values, contextual information, and expert insight that serves as a framework for evaluating and assimilating new experiences and information. To that extent, organizations continue striving to formalize knowledge management as a process in the best possible manner to leverage existing expertise and streamline knowledge transfer. Knowledge management is related with the generation, acquisition, integration, dissemination, and use of

knowledge to increase an organization's operational effectiveness and competitive advantage. Proper and effective knowledge management ensures timely availability and access of appropriate information to authorized individuals.

The findings of the research by du Plessis (2007) indicate that economic growth at the global level has changed due to fast pace of innovations. This he opines is due to the rapidly evolving technology, shorter product lifecycles and a higher rate of new product development. And owing to the vast access to knowledge in organizations, the relative complexity of innovation has also increased. In his research Najmaei (2012) describes innovation as a competency and knowledge-based endeavor. He further goes on to elaborate that this is a knowledge-based activity which is unique to an organization and should be used intelligently. He also highlights the importance of technological and financial resources which complement knowledge in an innovative process.

In research from Pai et al. (2019), they deduced that IT personnel of different levels have differing opinions on the kinds of factors influencing innovation in an organization. By using empirical investigation, a valid instrument can be inferred to find out different types of factors which influence new ideas. This tool can be used to identify and categorize these factors for organizations to become innovative. Naidoo and Hoque (2018) inferred from their empirical study that IT capabilities had a positive impact on the capability of firms to innovate and determining their performance. The research found that IT has a strategic role in a business and is not confined to being a shared resource.

As a result, IT resources, such as talent, infrastructure, and management, must be blended into VRIN (Valuable, Rare, Inimitable and Non-Substitutable) characteristics and have strategic value. Thus, IT along with knowledge are considered important contributors for innovation and certainly have a huge role to play in an organization's growth and success.

Rationale of the Study

Our research aims to fill a theoretical knowledge gap in the existing body of literature pertaining to relative importance of innovation drivers. Also, it aims to study the importance of strategic management innovation especially its acceptance in particular industry sectors. This is a key driver which aids organizational growth either through wealth creation or by other means. It is an interesting factor due to its propriety and high complexity, and hence a lower propensity of imitation. Since it is discerned from literature that there is a difference in considerations of innovation drivers in different

sectors, we aim to contrast three specific innovation drivers in two distinct industry sectors.

Objectives of the Study

Following are the objectives of the study:

1. To identify and measure key drivers of innovation.
2. To study difference between Education sector and IT sector drivers of innovation.

Research Questions

- a. Is there a difference between the importance of drivers of innovation in industry?
- b. Are the drivers of innovation equally important in different industry sectors?
- c. Is there a predominant driver of innovation in a particular industry sector?

Method

This study is based on primary data collected through a specifically constructed questionnaire.

Research Design

- Convenience sampling method was used with business professionals in the Education and IT sectors.
- Information was collected through an online questionnaire using 'Google forms'.
- Sample size of 34 has been considered based on complete responses received through convenience sampling.
- Grading and contrasting significance of three independent variables to innovation was considered to arrive at the outcomes.
- Data was analyzed using SPSS software (quantitative analysis).

Information was collected from respondents (industry professionals) who belong to two sectors, 'Education and Information Technology'. There are a total of 34 respondents out of which 14 are from education sector and remaining 20 are from IT

sector. There are three variables under the study and all three are independent variables. Mean score for these variables are presented in the Descriptive Statistics table (Table-1) below:

Table 1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
1. Strategic Management	34	28.00	100.00	76.35	19.256
2. Idea Generation	34	44.00	100.00	76.59	16.064
3. Knowledge and Technology	34	56.67	100.00	84.02	11.154
Valid N (list wise)	34				

It is observed that mean score for Knowledge and Technology is 84.02 per cent. It is highest among the three drivers of innovation. Mean score of Strategic Management and Idea Generation scores are at par, but less than the score of Knowledge and Technology.

Results

To study the first objective (identify and measure key drivers of innovation), the following hypothesis is designed:

Null Hypothesis H_{01} : There is no significant difference in three drivers of innovation.

Alternate Hypothesis H_1 : There is significant difference in three drivers of innovation.

To test above null hypothesis, Friedman test is used. Results are depicted in the Ranks table (Table-2) below:

Table 2: Ranks

	Mean Rank
1. Strategic Management	1.87
2. Idea Generation	1.78
3. Knowledge and Technology	2.35

Above table lists the mean rank scores according to their importance. Mean rank score is highest for Knowledge and Technology. To ascertain whether it is significant among three, it is tested, and the results are depicted in Test Statistics table (Table-3) below:

Table 3: Test Statistics (Friedman Test)

N	34
Chi-Square	6.945
Df	2
p-value	.031

Interpretation: The table above indicates that the calculated p-value is 0.031. It is less than 0.05 (5% level of significance). Therefore, the test (null hypothesis) is rejected, and alternate hypothesis is accepted. This indicates that there is a significant difference in the three drivers of innovation.

Finding: The 'Knowledge and Technology' is most prominent among the three drivers of innovation which were considered for the study.

Graphical presentation of the test is depicted in Figure-1 below:

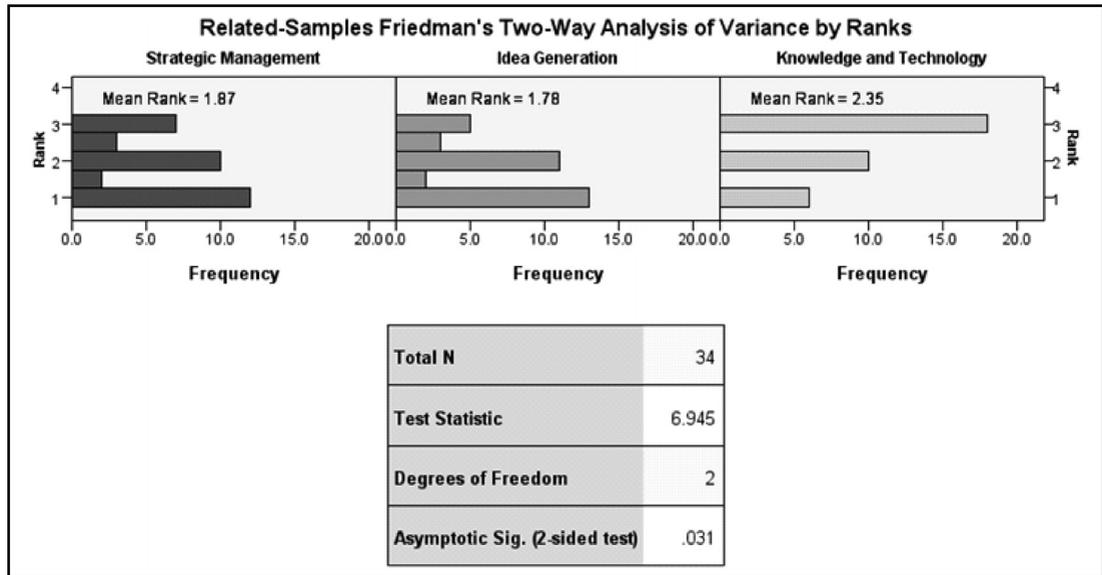


Figure 1: Friedman's Two-Way Analysis of Variance by Ranks

To study the second objective (difference between Education sector and IT sector in the three chosen drivers of innovation), following hypothesis is designed:

Null Hypothesis H_{02} : There is no difference between Education and IT sectors in the three drivers of innovation.

Alternate Hypothesis H_2 : There is difference between Education and IT sector in three drivers of innovation.

To test above null hypothesis, ANOVA is used, and F-test is applied. Results are as in the ANOVA table (Table-4) in the following page:

Table 4: ANOVA

		Sum of Squares	Df	Mean Square	F	p-value
Strategic Management	Between Groups	1006.850	1	1006.850	2.869	.100
	Within Groups	11228.914	32	350.904		
	Total	12235.765	33			
Idea Generation	Between Groups	1208.578	1	1208.578	5.292	.028
	Within Groups	7307.657	32	228.364		
	Total	8516.235	33			
Knowledge and Technology	Between Groups	1432.848	1	1432.848	5.391	.027
	Within Groups	8505.714	32	265.804		
	Total	9938.562	33			

Interpretation: Above table indicates that p-value for Strategic Management is 0.100. Since it is greater than 0.05, the test is accepted and it is concluded that for Strategic Management, there is no difference between Education sectors and IT sectors in drivers of innovation.

Table above also indicates that p-value for Idea Generation is 0.028 and for Knowledge and Technology is 0.027. Both values are less than 0.05. Therefore, test (and hence null hypothesis) is rejected. It is thus concluded that there is a difference between Education and IT sectors in these two drivers of innovation.

Findings: For findings of the study, mean scores for the three drivers and the two sectors are obtained and presented in the Mean table (Table-5) below:

Table 5: Report of Mean Scores

Type of Sector	Strategic Management	Idea Generation	Knowledge and Technology
IT sector	82.86	83.71	89.76
Education Sector	71.80	71.60	80.00
Total	76.35	76.59	84.0200

The above table indicates that for Strategic Management, the mean score in IT sector is 82.86 percent as compared to mean score in Education sector (which is 71.80 percent). But as earlier deduced (based on level of significance), Strategic Management score is not significantly greater for IT sector. Thus, it is considered equally important in both industry sectors.

Idea Generation mean score in IT sector is 83.71 percent, as compared to mean score in Education sector (which is 71.60 percent). Idea Generation score is significantly greater for IT sector.

Knowledge & Technology mean score in IT sector is 89.87 percent, as compared to mean score in education sector (which is 80.00 percent). Knowledge & Technology score is significantly greater for IT sector.

Discussion

It is discerned from literature that there are more than twenty drivers of innovation which contribute to business success. Gupta and Trusko (2014) refer to the PA Consulting Group's nine dimensions but many more innovation drivers among them. Similarly, the framework by Adams et al. (2006) dwells on 19 measurement criteria in seven categories. These are spread in various dimensions (input, process, and output dimensions) of the innovation cycle. Investments (financial and R&D related) and market focus (number of new patents, products, etc.) are obvious contributors and have very objective parameters for evaluation. Whereas culture, trust, supportive policies, etc. are subjective in nature can be considered as part of the HR support dimension. Similarly, risk, top management commitment and idea support would fall in the strategic management paradigm also very subjective in nature.

An attempt is made in the present paper to bring objectivity to the subjective innovation driver contribution and devise a mechanism for measurement of the same. The challenge is to establish a reliable framework to decide on the appropriate elements for measurement and have reliable data to support those measures to derive conclusive linkages. In the present study, the drivers and sectors are limited to derive insight at a smaller scale. The complexity of the framework would increase manifold with increase in parameters and sectors under consideration. In this study three specific drivers (viz. strategic management, idea generation and knowledge & technology) are considered.

All three selected innovation drivers are independent variables, considered to have least amount of cross department dependencies. While these may seem to be considered as input dimensions of innovation, the fact is that all three are equally important throughout the innovation cycle (input-process-output). In the extant literature there is no mention of relative importance of innovation drivers. Hence, in this study it was decided to assess their relative importance. Also, it was decided to ascertain which (if any) is considered more important for innovation realization by industry. Adequate focus on such drivers can prove to be a catalyst for innovation by others.

We have discerned from relevant literature that there are not many studies on comprehensive performance measurement of innovation capability. While some studies suggest measures which contribute to innovation in organizations, the measures they have considered are few and that too segregated. Innovation measurement and performance management with its constituent elements contributing to the organization's innovation capability in a comprehensive manner is not well embodied in current literature. Based on this pilot study, we feel that more drivers in diverse sectors need to be studied which may give rise to complex models.

Among the three drivers of innovation considered in this study, 'Knowledge and Technology' has emerged as a key driver for innovation. Also, based on the test results, it is inferred that the other two drivers under consideration (viz. Strategic Management and Idea Generation) are equally important though less significant compared to Knowledge and Technology. Even though they are in pursuit of better innovation practices, organizations and industry sectors have different focus areas giving varying degrees of importance to each. It is discerned that Idea Generation, Knowledge & Technology and Strategic Management perspectives indeed have varying degrees of importance in the sectors under study.

Based on the review of literature, it could not be conclusively determined which innovation drivers have predominant significance in specific industry sectors. In that respect, it was decided to determine whether the chosen innovation drivers were equally important to both industry sectors under consideration. Also, in case of variance in importance, to determine which were more important and in which sector. Accordingly, based on the study it is evidenced that 'Strategic Management' as a focus area of innovation is equally important in both Education and IT sectors. The focus of top management is considered paramount for furthering innovation irrespective of sector. Additionally, 'Idea generation' and 'Knowledge & Technology' innovation are

considered more significant drivers of innovation in the IT sector as compared to Education sector.

Conclusion and Implications

This study reveals that almost all organizations are engaged in identifying innovative practices to sustain and grow their business. The first objective of the study was to identify and measure key drivers of innovation. In this study three key drivers of innovation are considered viz. Strategic Management, Idea Generation and Knowledge & Technology. From the results it is concluded that 'Knowledge and Technology' is the most important factor among three drivers. Strategic Management and Idea Generation have equal weightage, though slightly less than 'Knowledge & Technology'. This is interesting because, innovation is intuitively related to new ideas and 'Idea Generation' being considered as most important. This study reveals that Knowledge and Technology focus is a more important driver of innovation and brings in focus the aspect of implementation and realization of ideas for innovation.

The second objective was to study the difference between Education sector and IT sector drivers of innovation. It has emerged that Strategic Management as a driver of innovation is considered equally important in both Education and IT sectors. Idea Generation and Knowledge & Technology in innovation are significantly important drivers for IT sector compared to the Education sector. This is something which the education sector professionals can consider for expediting pace of innovation in the education sector. To usher in more effective innovation, there is an impending need for more creativity and idea generation focus in the education sector. Also, Knowledge and Technology innovation focus needs to be stepped up which will help in realizing those ideas.

Limitations and Suggestions

The main limitation of the study has been the relatively small data set of respondents which is 34. Also, only three drivers of innovation were considered in this study among more than twenty identified drivers for innovation, the scope was thus limited to keep it manageable. Additionally, only two business sectors namely 'Education' and 'IT' were considered in this study. The results and findings are based on the perceptions of respondents and not linked to empirical evidence.

The study needs further elaboration with a wider spectrum of business sectors and a larger set of innovation drivers to be considered. Also, there needs to be a linkage or

relationship established between the drivers of innovation, the outcome of innovation and the corresponding contribution of it to business. That will however add to the complexity and would require more time. This pilot study paves the way for detailed research in this direction which is ongoing as an extension of this study and will be more beneficial to industry.

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Applicability of Human-Machine Interface and Artificial Intelligence in Recruitment: A Study

R V S Anutej*, V Padmaja**, P Bhanumathi***

Abstract

Human-Machine Interface, generally known as HMI, describes how humans interact with mechanical or electrical devices to perform or assist in performing human tasks as human resource is the critical factor for the success of an organization to boost its profitability. Artificial Intelligence demonstrates how machines take actions and complete the functions of a human to maximize the chances of success ability. This paper focuses on how HMI aims to reduce errors and discomfort, thereby increasing productivity and quality of interaction by providing a real-time and information-based interactive work environment. The intelligent screening process helps in high-volume recruitment by filtering and shortlisting the candidates. This paper also focuses on the relevance and applicability in hiring and recruitment. Also, it highlights the benefits of HMI leading to a reduction in costs and saving time. The conceptual paper has been developed based on secondary sources such as a review of other research papers, articles, websites, publications, and books. By using HMI and AI, the recruitment process becomes more efficient by reducing the cost and time of the organization.

Keywords: Computer machinery, digitization, social attributes, cost reduction, skill gap.

Introduction

Humans interact with machines in various ways, and the interface between humans and computers is crucial for providing the interaction. User interface (U.I.) is the space where interaction occurs. The primary aim of this interaction is to allow effective operation and control of the machine from the human end to provide user-friendly ways to produce desirable results. All the processes can be monitored and controlled on a single screen using the interface.

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Growth in human-machine interaction innovates newer interactions and intelligent adaptive interfaces rather than regular command or action-based interfaces. Human-machine interaction (HMI) studies the understanding, designing, and evaluation models of machines for adaptive learning (Goodrich and Schultz, 2007) of HR functions, while artificial intelligence (AI) explores the ability of machines to think and understand. It is the science of making intelligent computer programs (McCarthy, 1998). AI took a significant development when Alan Turing introduced algorithms into computer machinery, which laid the foundation for human-machine interfaces which merged with natural language processing is now used in mobile apps, websites, messaging apps, kiosks, etc.

Human resource involves different aspects such as recruitment, training, and development. Humans are the primary source of knowledge and expertise for any organization. Firms require quality personnel to accomplish the targets to sustain in this competitive environment. Identifying, hiring, and developing employees is the backbone of the economic health of any organization. Rapid technological developments provided new, intelligent, and digital ways to conduct the recruitment process. The abilities of humans are limited, and hence organizations consider using AI to process and find competent candidates for the crucial roles. Artificial intelligence achieves greater accuracy with the same budget. New technologies provide quick, cost-efficient ways of finding potential employees. AI helps in tasks like resume screening, shortlisting, and mapping the best fits (Upadhyay and Khandelwal, 2018).

AI is the base technology for many innovative advancements. AI is becoming a significant part of the talent acquisition of an organization. The company's expectations for employees have gone up, and they find the best match using AI. Recruitment is a costly process, and its errors impact its growth. Therefore organizations are using AI for faster and more intelligent decision-making. AI helps computers gain the abilities of humans like learning, development, and self-correction (McCarthy, 1974).

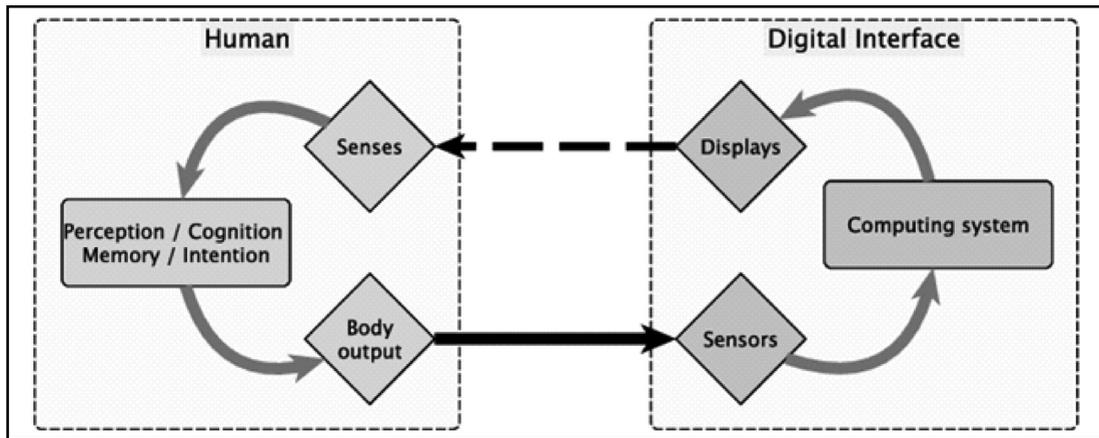
Artificial intelligence is used in eight significant components in recruitment. They are screening candidates, engagement, re-engagement, post-offer acceptance, new hire on boarding, career development, employee relations, and scheduling. One-fifth of employees will be virtual assistants by 2020 and reshapes the employee experience through interactions with complex enterprise systems. Usage of AI in human resources will increase from 29% in 2018 to 49% in 2022, and employees will be given the role of developing new algorithms and automation programs. Machines interacting with humans should build human characteristics such as communication and participation

(Breazeal, 2004). Enterprises are using digital human resource management as it is more productive and applies the same methods for interaction. Digital application tools became a part of the organization for selection, job evaluation, remuneration for quick processing, and interactions. Digitization mainly focused on three regions: labour, workplace, and human resources, which converts a traditional organization into a new network-based organization (Deloitte, 2016).

Modern technologies turn machines capable of performing physical tasks into machines performing cognitive tasks. The four pillars of organizational sciences are social networks, structuralism, information processing, and contingency theory, take a new turn. Now the organizational structure is revised according to the presence of complex, intelligent programs that integrate artificial neural networks and applied algorithms in organizational design for complex feedback mechanisms. It creates a strong connection of emotions and feelings between humans and machines.

Artificial intelligence eases the recruitment process by implementing what recruiters are looking for among candidates. AI collects information on qualifications, educational background, other factors, and analyses to check the compatibility with the organizational needs. Hiring people who do not accurately match the organizational needs will waste effort and resources for the organization. This can be resolved by applying AI in recruitment, providing opportunities only for the right fit. AI helps organizations to improve the way they recruit new hires, which further reduces the two most burdensome factors of any organization - cost per hire and time per hire. Artificial intelligence reduces the cost spent on job advertisement, gains more popularity and attention. Artificial intelligence is developed in other factors like natural language processing and comprehensive taxonomies. With this, the human resource manager can check the productivity of new hires and calculate the performance and retention rate. Human resource tools like training, work analysis, and developments in performance are becoming valid for machines also as they are crucial for motivation and team management in the organization (Thompson and Aspinwall, 2009).

Figure 1: A basic process of human-machine interaction.



Source: Karen Renaud and Richard Cooper, *Feedback in human-computer interaction - characteristics and recommendations*, 2000.

The interaction process between humans and machines can be demonstrated from the above figure. Sensors recognize human body outputs such as emotions and feelings, and computer systems analyze the inputs and displays output using its interface. The use of technology in recruiting process has become more routine among organizations. Technology-based recruitment refers to the utilization of technology in the recruitment process. AI has significant abilities like remembering, understanding, making choices, recognizing patterns, and automating recruitment and analyzing applicants' compatibility. The implementation of humanoid robots can be seen in service industries like hotels, restaurants, reports where robots take the primary responsibility of service (Stock and Merkle, 2018).

The best example for natural language processing is Google Translate, which is a multilingual neural machine translation service developed by Google to translate text, documents, and websites from one language into another. It works on the algorithm known as "Rosetta Stone," which compares and examines the input with millions of documents which are in different languages and creates a language model and social robots are the machines that play the assistive role and relate to us in a personal way which are also known as socially intelligent agents (Breazeal, 2004). Albert (2019) described that employer brand monitoring is the most sought AI activity followed by candidate engagement chatbots and automated scheduling of the recruitment process. We can also observe that the application of AI in recruitment is based on individual

needs and can be tailored for a specific set of recruitment activities undertaken by the organization.

Review of Literature

Literature reviews explore the possibility of the implementation considering barriers and influencing factors. They also represent the accuracy and authenticity of the process. Artificial Intelligence is the ability of computers to acquire thought processes like humans (Geetha and Bhanu, 2018) and automates humans' work, thereby developing speed and accuracy. Virtual assistants efficiently connect with candidates and evaluate them by interacting with them (R Vedapradha, R Hariharan, and Rajan Shivakami (2019). A mix of AI and natural language technology results in better performance interaction between humans and computers and automates the resume screening process, saving time for the recruitment process. During hiring, companies look for best fits cost-efficient and time-saving. AI is almost implemented in every sector of the economy (D S Rawat, general manager – ASSOCHAM, Artificial Intelligence, and Robotic, 2017). Artificial intelligence enhances the digital recruitment process, and chatbots come in handy for interviewing candidates and analyzing their compatibility.

Artificial intelligence helps recruiters analyze candidates' knowledge, sort resumes using data points (Strohmeier, 2020; Strohmeier and Piazza, 2015), and respond to candidates' questions with interactive voice responses, increasing candidates' satisfaction. One of the essential concepts of the human-machine interface is Synergistic intelligence means the intelligent behavior emerged from the human-machine interaction provides scope for new ways of understanding and interactive feedback between humans and machines, which contributes to self-development characteristics such as rational decision making, scheduling, responding to issues and adapting to changes in machines.

The social attributes scale measures competence, warmth, performance, arousal, discomfort between humans and machines, perceived level of interaction between humans and devices, and even suggests improvements in interaction in organizations (Claire and Jung, 2018). The process initiates with gathering the suitable candidate pool, which is followed by the selection criteria based on the nature of the job and then making the information reach the targeted pool of candidates and ends with evaluating the ability to learn from process and experiences (Breaugh, 2008).

Digital human resources play a significant role in the current competitive environment. It focuses on the three major components of organizational structure: labour, workplace, and human resources, which makes the organization a network-based organization, and all the information flows through the network rapidly efficiently. Organizations are using digital tools for faster processing and efficient interactions. The transformation in human resources created a new perception and new way of understanding between humans and machines, and functioning is modernized with the implementation of technological changes occurring in the field of communications which effectively evaluates the recruitment elements like speed, quality, and cost advantage and assessing employees based on their potential and abilities (Vardarlier and Zafer, 2020).

To meet recruitment elements like job descriptions, scheduling, training, development, employee satisfaction, and integrating all these elements using a network connection, organizations depend on the network-based digital human resource tools and implementation of artificial technology in this network enhances the processes and eases the recruitment process by reducing time and cost (Ruel et al., 2007). Recruitment activities like job posting and other activities are carried out by digitization. Internet is the top priority for recruitment for many organizations. Investment priorities of organizations also changed, and they are investing 60% for their company career website, 41% on the applicant tracking system and 29% on social recruitment, 28% on job postings, and only 9% on consulting firms (Vidros, 2016).

Application tracking system plays a significant role in transforming recruitment patterns in the organization. By investing more in application tracking systems, we can merge all the recruitment activities into a network-based project and create a sequential order for an efficient recruitment process. It is found that virtual networks in recruitment transform the recruitment pattern and pave the way for new technologies. Usage of technology in recruitment positively affected the recruitment process and organizational performance by making quick evaluations and effective modifications in the recruitment pattern. Human resource intelligence is a term used for proactive and systematic recruitment and performance evaluation that provides suggestions based on the historical patterns and process requirements. Machines will be the new colleagues and professionals in automated human resources and will assist humans in complex tasks (Manuti and Palma, 2018).

With the implementation of artificial intelligence, job seekers' experience and expectations are measured and compared with job requirements, matched candidates'

resumes and requirements are analyzed to check the probability of job fulfilment and recommend the best fit according to the organization's requirement. AI programs often respond to the learning needs and thereby adopt personalized learning styles depending on the conditions for effective outcomes (Cascio and Montealegre, 2016). Recruitment is a process of creating a pool of candidates from a diverse group to find the perfect fit for the organization. The primary objective of any firm is to persuade the selected candidates to handle the tasks effectively, keeping the organizational goals in mind and applying organizational strategy in the work process.

Organizational goals can be achieved only by placing the appropriate candidate to the job who can also integrate into the organization's culture (Newell et al., 2005). The recruitment process consists of specific steps such as administrative work, data management, decision making, and predicting the employees' behavior in the future so that the organization can plan the activities accordingly to reduce the time taken for replacement also to level up from the position without shelling out extra resources of the organization (Stoilkovka and Gjakovski, 2015), Savola, H., & Troqe, B. (2019). Any organization's primary challenge is selecting a perfect fit through the process stated above, which involves a specific sequence of steps necessary for recruitment. The implementation of artificial intelligence can ease the process and automate certain aspects of this sequence (Mathis and Jackson, 2008). This process doesn't end as stated above. It continues to performance evaluation, development pattern for the selected candidate, and other activities such as appraisal planning according to the environment (Kerrin and Kettle, 2003).

The application of artificial intelligence is made based on the level of intelligence required by the organization. As AI is a self-learning ability, the organizations make sure that their access is limited till the requirement and not into the sensitive areas which gain total control of the process and develop their network environment, which is hard for the employees to understand and also to operate the activities of the organization (Haenlein and Kaplan, 2019). Natural language processing (NLP) recognizes the speech, repeats them with the same pitch and tone, and hears variations in words to understand the user's emotional state. Calculate the user's stress to take necessary interactive steps to stabilize the environment and create a stress-free work area. It also translates the words from one language to another. NLP is further segregated into classification, translation, responding, and speech generation.

Recent innovations made interviewing robots possible, and we witnessed the first-ever interviewing robot in the United States, which a start-up firm in Stockholm

developed. This robot adopted the interviewee's way of thinking and responding and converted its interviewing pattern according to the person in front of the robot. Tech environment views this as the future of the recruitment process to remove bias and errors. Implementation of AI certainly has limitations organizations have to forgo the employees' crucial training hours. Changing human emotions cannot be analyzed as profoundly as other employees to help mentally handle the tasks. AI suitability to the culture of the organization, navigation in the external environment such as applicant's state of mind, understandability of the technology, the candidate may not be performed before because of some uncertain factors, and the applicant is willing to learn and improve himself which this technology can't understand as this only looks backward and not forwards, giving a chance to the candidate who missed a particular step of recruitment by a slight margin and can't proceed further (Lievens et al., 2002). It's a fact that AI has better predictability about performance, profitability, and job motivation, but it can't be the perfect case scenario to deploy technology to handle everything. It reduces the quantity of the data to be analyzed for recruitment (Jarrahi, 2018).

Background of the Study

The history of user interfaces dates back to 1969, where command-line interfaces (CLI) where communication happened through the request-response process. This process was tedious and error-prone, giving way to graphical user interfaces (GUI). GUI can process multiple inputs simultaneously, enhancing humans' interaction with machines. Slowly, the usage of smartphones, voice-enabled assistants, and AI started getting implemented in all functional areas in organizations.

Objectives of the Study

This paper focuses on applying human-machine interface (HMI) and artificial intelligence (AI) in the recruitment process. It also highlights the benefits of utilization of HMI in the recruitment process, which helps the organization reduce costs and time.

Research Questions

How well can organizations adopt artificial intelligence in the recruitment process?

What factors influence the implementation of AI and HMI in the recruitment process?

What is the accuracy of the recruitment process done using AI and HMI in an organization?

Method

This conceptual paper focuses on secondary data available in existing literature and research papers published on HMI and AI. A comprehensive survey of different works published in the areas of AI and HMI with specific reference to its applicability in recruitment was done. Research articles that were published during the last two decades in highly reputed and highly reputed journals indexed in Scopus, ABDC, Web of Science, EBSCO, JSTOR, Emerald, SAGE, ProQuest, and Elsevier were referred. Various websites that published articles on AI and HMI were referred to build and analyze the concepts systematically.

Application of HMI and AI in Recruitment

Recruiting is undergoing disruptive changes with the utilization of newer technologies. Expectations of hiring managers, job seekers, candidates are changing from passive to active and from acceptance to demand. Automated recruiting stacks are replacing the traditional administrative and assessment tasks. Recruiters design the interface to communicate with the candidates. HMI changes the nature of work by enabling man and machine to make decisions together for complex tasks, which improves creativity, persuasion, and innovation. AI helps remove bias and discrimination, thereby increasing diversity. This technology allows the exchange of information between humans and machines to create a communication process. AI automates the process, helps find the candidates familiar with the work, and reduces the time taken for the recruitment process. In some circumstances computers might observe the user and react according to their actions without any specific command from the user. AI helps in making cognitive decision-making by rapidly identifying patterns and predicting trends. AI looks at all the possible outcomes by plotting a curve and predicting the candidate's performance. The accuracy and completeness of AI make the recruitment process quick and efficient.

These technologies enhance the recruitment process by learning the details and skills of candidates and predicting compatibility for the job. It reduces or even removes the time-consuming activities for the recruitment process. The automated method of AI helps in high-volume tasks. AI automates the process, helps find the candidates familiar with the work, and reduces the time taken for the recruitment process. Recruiters can spend time on strategic hiring and improve quality by standardizing job matching, and automated recruitment process such as resume screening. The objective of these technologies is to learn candidate's needs, developing different kinds of persons as to communicate with other candidates. Gathering the insight of actual data and analyzing

that with required characteristics, understanding the information from the candidate's perspective, and analyzing how they feel and utilization level.

It is convenient for the candidates to apply for the job by assessing their skills and knowledge. Providing guidelines on quick, meaningful feedback and explanation for rejection or selection of candidates. The foremost thing to consider is giving an equal chance to all the candidates who may not perfectly fit the job role but are willing to transform themselves. Savola, H., & Troqe, B. (2019) explained the organizations' benefits through AI implementation. Most of the organizations stated that they are relatively high to very highly benefitted from AI implementation in certain activities such as efficiency, quality and serviceability of the technology implemented in the recruitment process.

Data, Methods, and Techniques

Artificial intelligence interconnects with a human-machine interface to analyze human body movements. Human body movements are essential for human-to-human interaction and human-to-computer interaction. It is achieved by connecting sensors to modular computer architecture. This system uses a multi-class statistical model of the color and shape of a person and tracks their head and hand in various viewing conditions. Adelson et al. (1984) suggested that artificial intelligence's image processing process is done to understand the depth of emotions, facial movements, and emotions.

Artificial intelligence collects data and analyses that data using algorithms, compiles a program to run repetitive tasks, and assists humans in decision-making. AI automates manual and routine tasks and uses autonomous intelligence for non-repetitive tasks. Artificial intelligence takes over tasks like analyzing behavior data by analyzing their browsing history and personal behavior in society. It analyses millions of data points to understand various personas, target the best matches, and deliver feedback to the candidates about their selection or rejection. A newer development in this process is using chatbots, where resumes are converted to data points. Artificial intelligence is employed to filter out the top preferred list. Chatbot communicates with them by asking questions, analyzing their answers, and even analyzing languages like fluency and pronunciation. These candidates are tested in various ways by AI, such as processing speed, pattern recognition, avoiding distraction, perseverance, and creativity. Artificial intelligence then collects behavioral analytics from video interviews and analyses the main components like body language, tone, gestures, and gestures to eliminate unconscious bias.

Table 1: Precision of artificial intelligence on human emotions

	Happy	Angry	Sad	Surprised	Scared	Disgust	Neutral	Recall
Happy	138	0	1	0	0	0	1	0.99
Angry	1	116	2	1	3	11	0	0.87
Sad	3	4	109	19	2	1	1	0.78
Surprised	0	1	6	128	0	0	0	0.95
Scared	0	8	5	2	115	5	3	0.83
Disgust	1	5	3	0	3	125	0	0.91
Neutral	0	11	2	1	1	0	125	0.89
Precision	0.97	0.80	0.85	0.85	0.93	0.88	0.96	0.89

Source: *Human-Machine Interaction* by James Cannan.

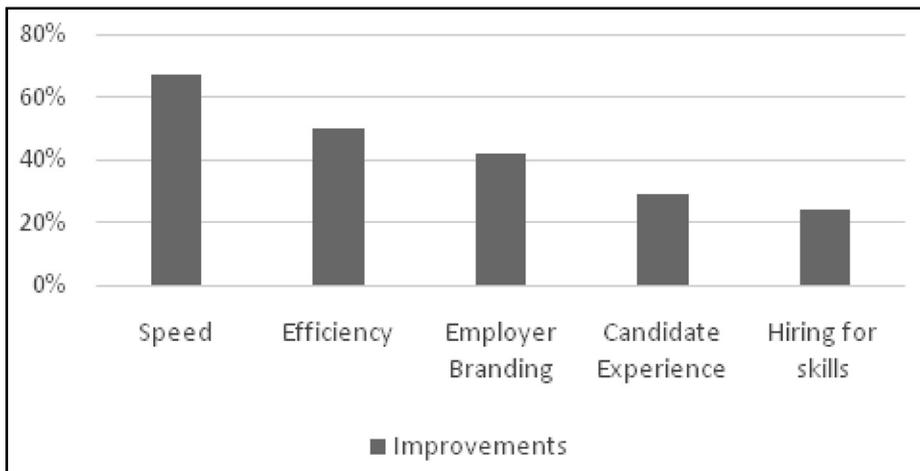
The above table calculates the precision of artificial intelligence systems in analyzing and understanding human emotions using facial expressions known as principal component analysis. In this analysis, the parameters are on the vertical axis, and the visual or descriptive cues are on the horizontal axis. The components are converted into logarithmic values and analyzed using the chi-square test. Results showed that out of 150 components of parameters and visual cues, 138 parameters matched happiness, which means 97% precision in analyzing human emotions. One hundred sixteen components matched in case of angry making it 80% precise. Sad gained 85% precision with 109 components reaching. In case of surprise, 128 components matched and made 85% precision. Scared components matched is 115 with 93% precision. Both disgust and neutral made 88% and 96% precision with matching 125 components of parameters with visual cues.

Hiring involves different levels, and the first level is sourcing, where artificial intelligence analyses the job description, compares with candidates' details, and filters out the top priority list, an assessment of qualifications using pre-programmed commands at the second level. The third level is interviewing via chatbots or video calls. And the final is a selection of the candidate. Artificial intelligence answers all the questions using chatbots and schedules according to the candidates' preferences and enhances the recruitment process speed.

Discussion

Organizations are evolving in terms of quality-based productivity, and they are opting for an applicant tracking system that evaluates candidates using keywords. The application tracking system is now developed into a talent acquisition system that tracks abilities and skills and provides real-time feedback. Usage of AI in recruitment reduces biases, improves employee relationships, and enhances the workplace environment. AI processes enormous volumes of data and replaces various tasks at the workplace (PwC, B. 2017). Artificial intelligence replaces 82% of the paperwork, 79% of the schedule, 69% of the personal expenses, 60% of email management, 37% of the HR management. A recent study revealed that recruitment efficiency is increased by 150 percent after implementing AI in recruitment and 58% of candidates are comfortable interacting with artificial intelligence. A recent survey found that 60% of job seekers avoid lengthy recruitment processes, and 80% say they avoid applying for a company that didn't notify them of their application status.

Chart 1: Improvements in specific areas using AI and HMI

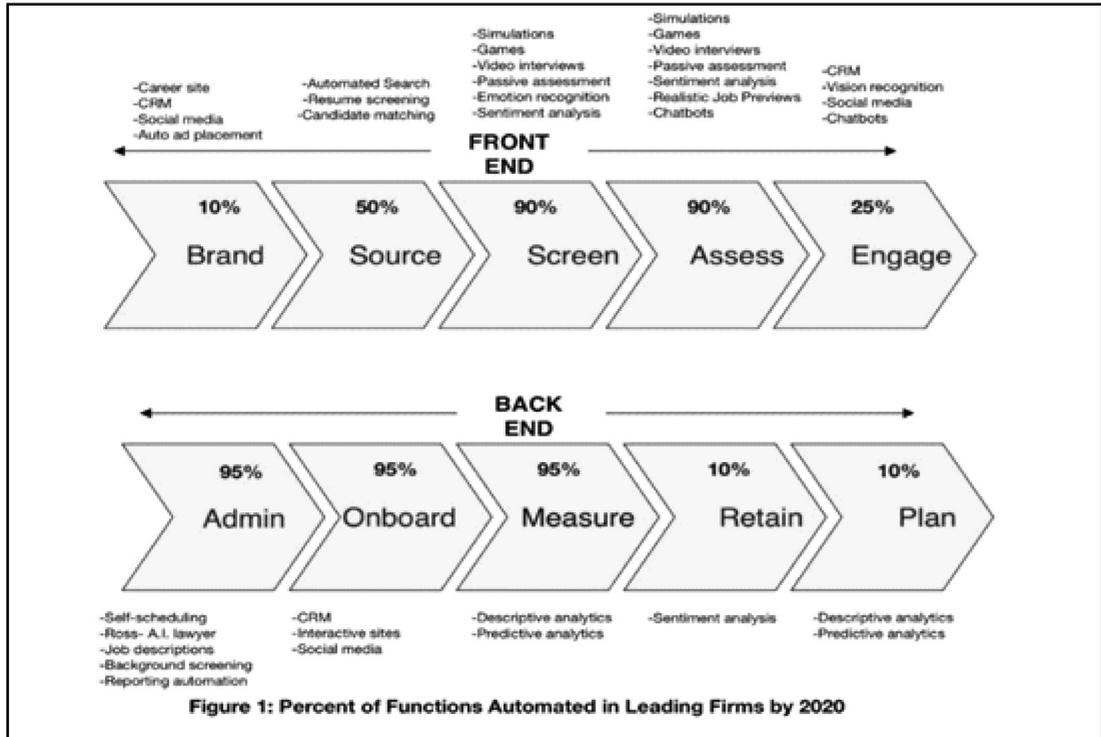


Source: *The impact of Artificial Intelligence in Talent Acquisition Lifecycle of organizations.*

The above improvements showed that more than 60% of organizations accepted that usage of artificial intelligence increased speed. Half of the organizations agreed on efficiency improvement. Employer branding gained more than 40%, and candidate experience and hiring for skills gained more than 20% acceptance among the organizations. Organizations reported that artificial intelligence removes 65% of resumes in the first stage of recruitment of high volume requirements and makes their work more convenient. (Source: heaver.com/blog/-in-recruitment). Artificial

intelligence helps in the reduction of bias and discrimination. 49% of candidates stated that their chances of getting hired improved and 56% of candidates said that it removed biased recruitments, and 80% of executives noted that the efficiency of recruiting improved.

Figure 3: Functions that will be automated in the coming years



Source: www.linkedin.com/pulse/automation-future-recruitment, 2019

The above figure shows the estimate for future technology usage in recruitment. Admin, On-board, and Measure components will make the most transformation by depending on automation at about 95%, Screening and Assess by 90%, Sourcing by 50%, Retention, planning, and branding by about 10%.

Advantages of using technologies in recruitment

Cost Reduction – using the human-machine interface and artificial intelligence reduces cost by automating manual and repetitive tasks. All the processes can be monitored and controlled on a single screen. Assessing the candidates online reduces cost and increases efficiency.

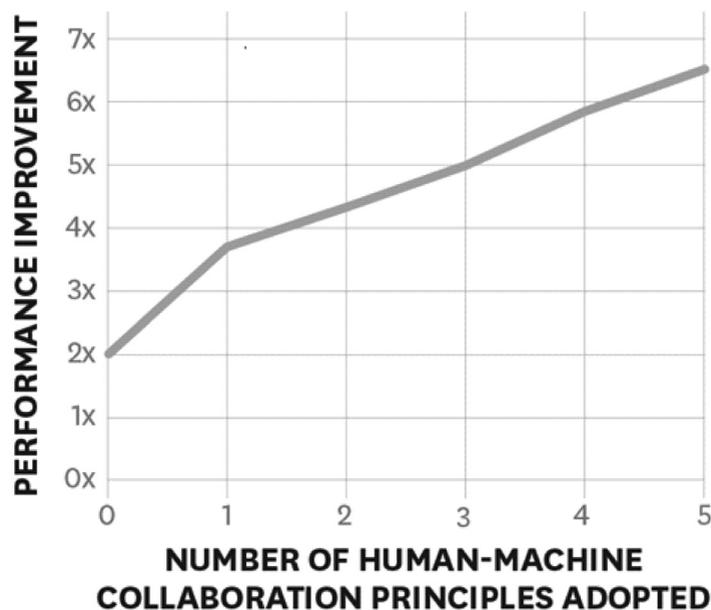
Time – as the process is automated and all the recruitment processes can be completed in the stipulated time, the interface asks for human suggestions only for complex tasks. Artificial intelligence analyses all the resumes using pre-defined filters and sorts out the matching candidates.

User friendly – the essential feature of these technologies is user-friendly. The entire process is managed with a single click. It can be adjusted to display the functions which are required.

Quality hiring – artificial intelligence improves hiring quality by screening every application and sorting out candidates matching the required preferences. Some processes even include face data reading to enhance the quality of hiring.

Performance improvement – all the repetitive tasks are carried out without any intervention. And suggestions are needed only for complex processes and even display different alternatives, and their outcomes improve decision-making speed.

Figure 4: Performance improvement Vs. Human-machine interfaces



Source: Collaborative Intelligence, H. James Wilson and Paul R Daugherty, 2018.

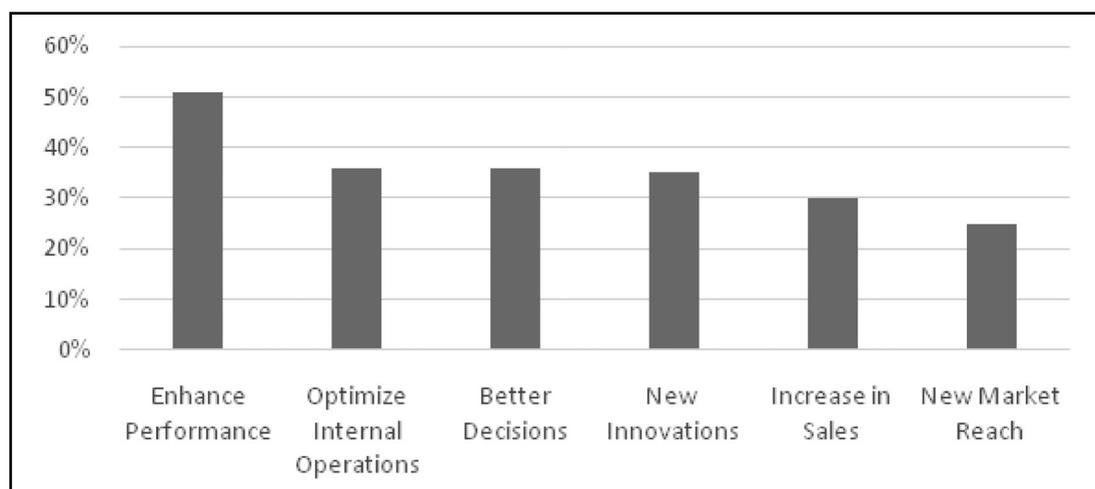
The above figure explains the number of automated programs implemented by the organization which is positively related to the improvement in performance.

Decision making – all the matching or preferred candidates are filtered through various levels of the hiring process and makes the decision-making process more effective by only selecting the required candidates who fulfil the organization’s needs. Guide the user with different outcomes.

Flexibility – human-machine collaboration helps change the work environment by taking over the analysis and control part from humans and screening the real-time process updates and changes required for various outputs.

Speed and Scale – technology usage increases speed as most manual tasks are automated, and screening is done in minutes with predetermined commands even for vast volumes of data.

Chart 2: Changes in performance related to the implementation of technologies



Source: *Artificial Intelligence for the Real World*.

The above chart shows the changes after implementing artificial intelligence in recruitment. Performance enhanced by 50%, internal operations, decision-making abilities, and encouragement for innovations improved by more than 30%. Newmarket research and sales increased by more than 25%.

Limitations of technologies in recruiting

Expensive – the major drawback of opting for technology like the human-machine interface or artificial intelligence in recruiting is spending a significant amount on the technology. Even the modifications for the process require a lot of expertise.

Security – artificial intelligence stores all the data of candidates and analyses according to the given preferences. There is a threat that the data may be hacked as it contains all candidates' personal and educational qualifications.

Skill gap – technology innovates day by day, and they need different and unique algorithms to process data. Modifications or alterations of algorithms can be done only by experts, and even a small error changes the process and affects the output of that process.

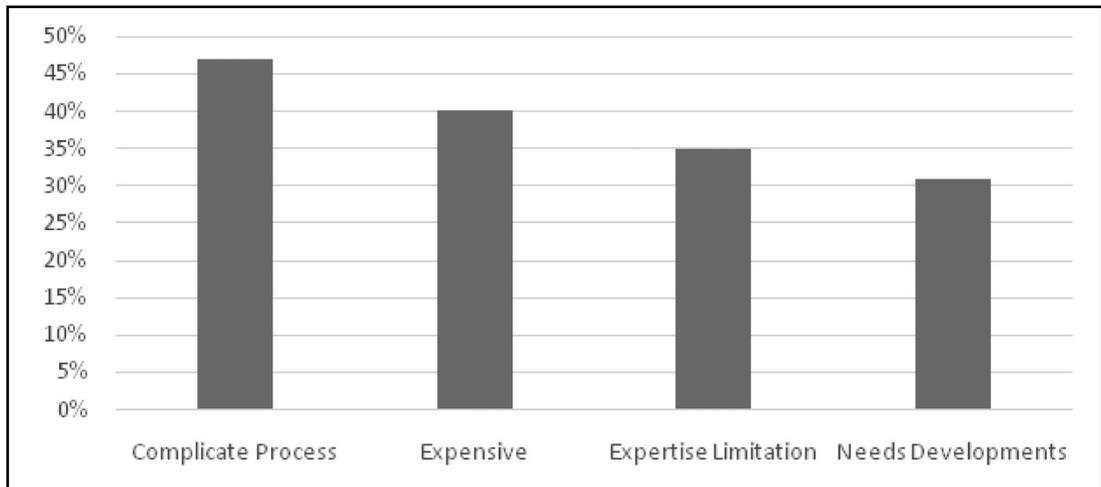
Unemployment – the main reason the government is not encouraging newer technology is that they can do the work of all the people in the organization and do the job all the time without getting tired or bored, causing severe unemployment problems.

Decision-making – a human-machine interface is programmed by commands, and these technologies only process what we give as input. They never think out of the box or stall when they face a new kind of error not programmed in their algorithm.

There is no improvement with experience – they do the repetitive tasks without getting bored, and they never think of another way of solving a complex problem. Even though they carry out regular duties, they don't know how to handle things they never encountered.

It depends on how we use it – they perform tasks according to our commands, and lack of judgment skills makes them vulnerable to the humans who use it in the wrong way. Wrong hands may use it as a weapon of mass destruction, harming humankind. Control of these machines is complicated because of their self-improvement ability.

Chart 3: Limitations of implementing AI and HMI in Organizations.



Source: *Artificial Intelligence for the Real World, Davenport and Ronanki, 2018.*

The above chart explains that the implementation of artificial intelligence made the recruitment process complicated in more than 45% of organizations. 40% of the organizations accepted that it was an expensive process. More than 30% of organizations voted that it is limited in expertise and needs further developments.

Summary of Literature

Author	Publication Details	Focus points of Discussion	Contribution
		Survey on 250 organizations that use AI, one third stated that the technology transformed the recruitment in 3 years	Only 22% of the companies are considering reducing headcount. AI provided a framework of how a company should organize and utilize its cognitive capabilities
Davenport, T. H., & Ronanki, R. (2018).	Artificial intelligence for the real world. <i>Harvard Business Review</i> , 96(1),108-116.	Computer vision allows the machine to see even the things which naked eye cannot see	Implementation of nanotechnology can provide feasibility to create nanomachines with more efficiency
Cannan, J., & Hu, H. (2011).	Human-machine interaction (HMI): A survey. University of Essex.	Technological development allowed us to try different tools in recruitment and to filter huge masses of applications	Using technological tools, recruiters can do the work based on accurate information and improve the quality of new hires
Oksanen, R. (2018).	New technology-based recruitment methods (Master's thesis).	AI implements a single standard of measurement and eliminates bias in the recruitment process	AI optimizes the analysis process using algorithms that take care of errors and sometimes even create alternatives
Anand, S., Sinha, A., Tiwari, U., & Ray, S. (2014).	Artificial Intelligence: Literature Review. The Centre for Internet and Society, India.	AI technology helps H.R. managers to attract, inspire and retain a skilled workforce and maximizes the chances of attaining organizational goals	AI forwards customized messages to the candidates about the status of their interview process. Saved a lot of time and money in the recruitment process and even made efficient hires
Raviprolu, A. (2017)	Role of Artificial Intelligence in Recruitment. International Journal of Engineering Technology, Management and Applied Sciences, 5(4).	Face recognition is further classified into face finding, face modeling, and face classification	AI merged with active appearance model organized emotional expressions and attended high accuracy and enhanced the person identification system

Den Uyl, M. J., & Van Kuilenburg, H. (2005, August).	The FaceReader: Online facial expression recognition. In <i>Proceedings of measuring behavior</i> (Vol. 30, No. 2, pp. 589-590). Wageningen.	Human-Machine Interaction is developed based on cognitive psychology, neuroscience, artificial intelligence	The implementation of AI in Human-Machine Interfaces allowed them to learn and adapt to rapid changes quickly. Reducing the impact of errors and saving from catastrophies
Morgan, P., Caleb-Solly, P., Voinescu, A., & Williams, C. (2016).	Literature review: human-machine interface. Project Report., UWE Bristol	Employers should consider the recruitment outcome accomplished based on the recruitment process	Selection is on the ability to learn from processes and experiences rather than the past data of the candidate
Breaugh, J. A. (2008).	Employee recruitment: Current knowledge and important areas for future research. <i>Human Resource Management Review</i> , 18(3), 103-118.	Knowledge management of any organization enhances the technological adaptability of the organizational culture	Knowledge Management is crucial for any organization to lay the foundation for any innovation to be implemented in the culture
Lapiòa, I., Maurâne, G., & Stariòeca, O. (2014).	Human Resource Management Models: Aspects of Knowledge Management and Corporate Social Responsibility. <i>Procedia- Social and Behavioral Sciences</i> , 110, 577-586.	Selected candidates should match the organizational aspects to improve the productivity of the firm	The primary objective is to recruit candidates who can handle the tasks effectively by keeping organizational goals in mind to provide their best output
Kamran, A., Dawood, J., & Hilal, S. B. (2015).	Analysis of the recruitment and selection process. In <i>Proceedings of the Ninth International Conference on Management Science and Engineering Management</i> (pp. 1357-1375). Springer, Berlin, Heidelberg.	The recruitment process is creating a pool of targeted candidates to filter the perfect fit for the role the organization is searching for	Recruitment should also tackle certain other aspects such as administrative work, behavior analysis, decision making, and data management

<p>Stoilkovska, A., Ilieva, J., & Gjakovski, S. (2015).</p>	<p>Equal employment opportunities in the recruitment and selection process of human resources. <i>UTMS Journal of Economics</i>, 6(2), 281-292.</p>	<p>AI implementation is based on the level of intelligence required by the activities of the organization</p>	<p>The self-learning ability of artificial intelligence must be limited to the requirements specified by the organization and not extended to every sensitive aspect of the organization</p>
<p>Kaplan, A., & Haenlein, M. (2020).</p>	<p>Rulers of the world, unite! The challenges and opportunities of artificial intelligence. <i>Business Horizons</i>, 63(1), 37-50.</p>	<p>AI implementation is based on the level of intelligence required by the activities of the organization</p>	<p>The self-learning ability of artificial intelligence must be limited to the requirements specified by the organization and not extended to every sensitive aspect of the organization</p>

Limitations of the Study

Artificial intelligence in recruitment is still in the development phase, and this study is a forecast of the possibility of events shortly. Artificial Intelligence and human-machine interfaces are costly and complex processes; the forecast applies to the organizations which implement artificial intelligence or human-machine interfaces or both in the recruitment process. Since this paper is based only on secondary data and research publications of other researchers and authors, it does not reflect a comprehensive picture of various organizations.

This data is just an analysis based on interpretation of research journals and publications, and actuals may vary depending on the advancements and innovations in artificial technology or the recruitment process.

Scope for further research

As the organizations are implementing artificial intelligence and human-machine interfaces in the recruitment process, we can analyze the impact of technology on the recruitment process. Comparing the performance of hires recruited through technology and traditional recruitment. Impact of technology on retention rate in the organization. Applying Natural language processing to artificial intelligence and human-machine interface to analyze the efficient feedback process and update candidates using chatbots. Exploring the ability of these technologies to improve with experience and

enhancing decision-making skills by assessing the impact of decisions on the organization.

Conclusion

This study shows that applying a human-machine interface and artificial intelligence enhanced the recruitment process and made it more efficient. AI helped abolish significant challenges like bias, discrimination, and recruiters' personal preferences' and helped achieve equality by treating everyone the same and increasing the speed by automating the recruitment process to find the correct match for the job role.

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Aptitude Testing in MBA / PGDM Entrance: A Validity Study

Apoorva Palkar, Sunil Joshi***

Abstract

Aptitude refers to applicant's ability to perform a task. It also reflects an applicant's knowledge of a particular field. Verbal reasoning, numerical reasoning, inductive reasoning, logical reasoning, and critical reasoning are all measures that can be used to assess aptitude. It refers to how quickly an applicant's intellect works in a given situation. There are various MBA/PGDM admission tests in India, and one of them is ATMA (AIMS Test for management Admissions). The current research focuses on the ATMA test and its numerous testing sections to determine the success rates of candidates from various undergraduate programmes. The exam is divided into three sections: analytical reasoning, verbal skills, and quantitative skills, each having two sections. The researchers have tried to find the relationship between the marks obtained by the applicants in each section, correlation between ATMA marks with class and applicants' graduation academic background as well as whether applicants' academic grade and background has significant impact on ATMA marks.

Keywords: Analytical Reasoning, Quantitative Skills, Verbal Skills.

Introduction

Admissions to MBA/PGDM institutions are done through entrance test. Nationally recognised tests include MAT (Management aptitude test), CAT (Common admission test), ATMA (Aptitude test for Management admission), XAT (Xavier aptitude test) which are predominant. Few tests conducted by Universities like SNAP of Symbiosis University, NMAT of NMIMS Mumbai while few states have entrance test for admission to MBA program in the state affiliated MBA programs and GMAT (Graduate management aptitude test) is recognised in few premier Business institutes in India as well as Top institutes worldwide. More than 2,00,000 students appear for the entrance test nationally to various Business institutes across the country. Each test has its own unique ways to judge the aptitude of the student and broadly the three areas in these

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tests commonly are Quantitative Aptitude (QA), Data Interpretation & Logical Reasoning and Verbal & Reading Comprehension with varying degrees of difficulty level.

ATMA is a reliable, extensive, and single-window test for admission to a variety of post-graduate management programmes, including MBA, PGDM, MCA, and other post-graduate management courses in India. ATMA is a nationally recognised, high-quality online objective type entrance exam. This test is recognised by the AICTE and the Ministry of Education of the Government of India, and it is conducted in all Indian states. The test is designed to examine students' potential for higher management education and is divided into components that focus on verbal, quantitative, and analytical reasoning skills. [1]

Many business institutes have been using formula for admission to MBA program which takes into consideration the overall score in entrance test and undergraduate marks (Braunstein, 2002; Hedlund, Wilt, Nebel, Ashford, and Sternberg, 2006; Kass, Grandzol, and Bommer 2012; Loucopoulos, Gutierrez and Hofler, 2007; Ragothaman, Carpenter, and Davies, 2009; Yang and Lu, 2001). Some of the Business institutes do give weightage to the work experience (Braunstein, 2006; Deis and Kheirandish, 2010), Performance in quantitative section and verbal section and overall score was the best predictor of getting a good business school (Talento-Miller & Rudner, 2008). Mzilindile Claudius Mafani studied role of cultural background, work experience as predictor of success to a Business School.

Researches done in the past have been on GMAT, the international test, and there is very little work that has been done on Indian aptitude tests to establish correlation between scores, graduation stream and individual section scores. The current study focuses on ATMA test and its various testing sections to understand the success rates of the candidates from various streams of under-graduation. The exam has sections like analytical reasoning skills, verbal skills and quantitative skills with two sections of each. The test has a total of 180 questions and about 30 minutes for each section, all MCQs and total 3 hours with no negative marking.

Objectives of the study

- 1) Determine correlation between Applicant's quantitative, verbal, and analytical marks.
- 2) Determine correlation between Applicant's ATMA marks with class and graduation academic background.

- 3) To investigate if Applicants' academic grade and academic background has Significant Impact on Total Marks.

Hypotheses of the study

- 1) H1: There is a significant Impact of Graduation grade on Total Marks scored in ATMA Test.
- 2) H2: There is a significant Impact of academic background on Total Marks.

Method

Research Design

Data collected has been analysed using the statistical techniques to seek a correlation between Applicants' academic background with quantitative marks, verbal marks, and analytical marks. We have also determined mean and standard deviation of Applicants' graduation academic background.

Data Collection

The data collection method is determined by the type, scope, budget and time constraints, precision factor, and other factors. Primary and secondary data collection methods are used to gather information. We will base this research on the primary data gathered from ATMA exams conducted between 2013 and 2021.

Main ATMA sample

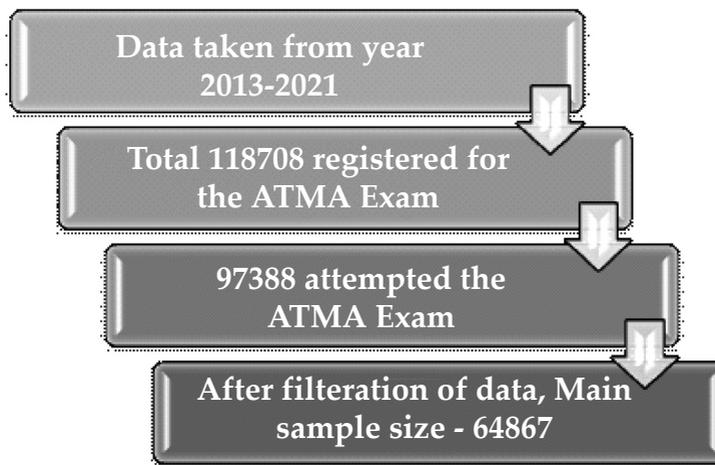


Table 1: Main candidates sample size

	Main sample	
	N	Percent
ATMA Exam	64867	100

Source: ATMA Data

Total of 1,18,708 candidates had registered for the ATMA test between 2013 till 2021, out of which 97,388 attempted the test. After removing improper data, we have worked on 64,867 ATMA candidate records.

Table 2: Background characteristics of the main sample

		N	Valid Percent
Sex	Male	41257	63.602
	Female	23610	36.398
Academic Data	BCom	18381	28.336
	BE	10402	16.036
	BSc	9280	14.306
	BA	7253	11.181
	BBA	5076	7.825
	BTech	4914	7.576
	Other	4659	7.182
	BCA	2337	3.603
	BMS	1288	1.986
	BCS	768	1.184
	BMM	155	0.239
	MTech	153	0.236
	MCA	104	0.160
	ME	48	0.074
	BBACA	48	0.074
BSc – Biotechnology	1	0.002	
Statewise Data	Maharashtra	36271	55.916
	Madhya Pradesh	5488	8.460
	Orissa	5111	7.879
	Uttar Pradesh	3342	5.152
	Chattisgarh	2523	3.889

	Telangana	1673	2.579
	Gujarat	1479	2.280
	Andhra Pradesh	1340	2.066
	Jharkhand	1225	1.888
	Delhi	1130	1.742
	Bihar	851	1.312
	Rajasthan	833	1.284
	West Bengal	775	1.195
	Karnataka	761	1.173
	Tamil Nadu	495	0.763
	Haryana	369	0.569
	Kerala	236	0.364
	Uttarakhand	168	0.259
	Assam	144	0.222
	Goa	117	0.180
	Punjab	137	0.211
	Jammu and Kashmir	97	0.150
	Dadra and Nagar Haveli	87	0.134
	Himachal Pradesh	64	0.099
	Uttaranchal	42	0.065
	Tripura	23	0.035
	Nagaland	16	0.025
	Manipur	15	0.023
	Pondicherry	11	0.017
	Meghalaya	10	0.015
	Daman and Diu	9	0.014
	Andaman and Nicobar Islands	8	0.012
	Mizoram	6	0.009
	Arunachal Pradesh	6	0.009
	Sikkim	3	0.005
	Lakshadweep	2	0.003
Graduation Grade-wise Data	Distinction	13344	20.571
	First Class	25628	39.509
	Second Class	22155	34.155
	Pass Class	3740	5.766
Total		64867	100

Source – ATMA Data

Around 63.602% male candidates and 36.398% female candidates have attempted ATMA between 2013 and 2021. To take admissions in the management schools, one must complete graduation with other eligibility criteria.

Table 3: Experienced Candidates Appeared in ATMA

	N	Percent	Total M/F
Male	8778	21.27639	41257
Female	4364	18.48369	23610
	13142	39.7600	64867

Source – ATMA Data

Table 4: ATMA Scores

		N - 64867		
Total ATMA Score (out of 800)		41257	23610	
Greater than or Equal to 550		Male	Female	
	BA	102	91	
	BCom	813	624	
	BE	2096	636	
	BSc	344	291	
	BTech	1021	342	
	BBA	221	157	
	BBACA	1	3	
	BCA	64	29	
	BCS	22	10	
	BMM	7	12	
	BMS	100	72	
	ME	8	3	
	MTech	29	8	
	MCA	4	12	
	Other	238	241	
	Total	5070	2531	7601
	Percentage	12.29	10.720034	

Less than 550 and Greater than 400		Male	Female	
	BA	1170	686	
	BCom	4097	3279	
	BE	3296	1486	
	BSc	2020	1554	
	BTech	1536	660	
	BBA	1322	832	
	BBACA	15	11	
	BCA	423	298	
	BCS	152	159	
	BMM	34	50	
	BMS	359	326	
	ME	18	6	
	MTech	55	24	
	MCA	22	16	
	Other	1055	952	
	Total	15574	10339	25913
	Percentage	37.75	43.790767	
Less than or Equal to 399		Male	Female	
	BA	3551	1653	
	BCom	6039	3529	
	BE	2100	788	
	BSc	3355	1716	
	BTech	992	363	
	BBA	1675	869	
	BBACA	9	9	
	BCA	952	571	
	BCS	244	181	
	BMM	27	25	
	BMS	257	174	
	BSc - Biotechnology	0	1	
	ME	11	2	
	MTech	27	10	

	MCA	32	18	
	Other	1342	831	
	Total	20613	10740	31353
	Percentage	49.96	45.489199	

Source – ATMA Data

Results and Discussion

Table 5: Mean, Median and S.D: Quantitative, Verbal and Analytical Marks

Statistics

		Qmarks	Vmarks	Amarks
N	Valid	64867	64867	64867
	Missing	0	0	0
	Mean	28.38	38.232695	38.259191
	Median	22.92	40.86000	41.250000
	Std Deviation	23.745	22.8663879	21.0946280

Source: SPSS Analysis

From Table 5, Means of verbal and analytical marks are 38.23 and 38.25, respectively which are approximately same and quantitative marks is 28.38; so, we can say that the ATMA applicants in verbal and analytical sections scored better on average than quantitative marks.

There are 6 sections comprising 2 of quantitative, verbal, and analytical reasoning; so, there are 60 marks for quantitative, verbal as well as for analytical reasoning in the ATMA exam. Median of analytical marks is 41.25 whereas verbal marks is 40.86 and quantitative marks is 22.92. Standard deviation of analytical marks is 21.09 which is lesser than quantitative and verbal marks so that we can say that ATMA applicants are having more consistent marks in analytical reasoning than the other two whereas standard deviation of verbal marks has 22.87 and quantitative marks has 23.75.

Table 6: Correlation - Quantitative, Verbal and Analytical Marks

Correlations

		Qmarks	Vmarks	Amarks
Qmarks	Pearson Correlation	1	.575**	.661**
	Sig. (2-tailed)		.000	.000
	N	64867	64867	64867
Vmarks	Pearson Correlation	.575**	1	.702**
	Sig. (2-tailed)	.000		.000
	N	64867	64867	64867
Amarks	Pearson Correlation	.661**	.702**	1
	Sig. (2-tailed)		.000	.000
	N	64867	64867	64867

** Correlation is significant at the 0.01 level (2-tailed).

Source: SPSS Analysis

From the Table 6, the correlations of Quantitative, Verbal and Analytical Marks are significant at 0.01 level. As the correlation value of Quantitative marks and Verbal marks is 0.575, Quantitative marks and Analytical marks is 0.661, and Verbal marks and Analytical marks is 0.702, all the three values lie between ± 0.50 and ± 1 , the correlations are said to be strong.

Total Marks versus Gender and Academic Background

SPSS cross tabulation applied on the data to know the mean score and standard deviation obtained from male and female applicants and with respect to academic background.

Case Processing Summary

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
Total 800 * Gender	64867	100.0%	0	.0%	64867	100.0%
Total 800 * Academic_ Background	64867	100.0%	0	.0%	64867	100.0%

Source: SPSS Analysis

Table 7: Marks obtained out of 800 Vs Gender

Total 800

Gender	Mean	N	Std. Deviation
Male	405.645038	41257	124.2883524
Female	414.614366	23610	112.1034825
Total	408.909654	64867	120.0733616

Source: SPSS Analysis

As per the Table 7, mean score of male applicants, i.e., 405.65 is slightly less than female applicants, i.e., 414.61 and standard deviation of female applicants is 112.10 which is less than the standard deviation of male applicants, i.e., 124.29; so, female candidates are having more consistent marks than male candidates.

Table 8: Marks obtained out of 800 Vs Academic Background

Total 800

Academic_Background	Mean	N	Std. Deviation
BA	331.954937	7253	113.3689405
BCom	398.576567	18381	109.0352815
BE	474.885116	10402	116.1509492
BSc	386.332856	9280	117.0621720
BTech	476.952302	4914	117.6607893
BBA	402.034350	5076	107.8649541
BBACA	424.027292	48	103.3693496
BCA	366.374403	2337	99.7169492
BCS	385.290586	768	99.7467704
BMM	443.639871	155	96.9906329
BMS	446.869643	1288	95.8186991
BSc-Biotechnology	309.160000	1	
ME	468.826042	48	107.2027524
MTech	473.516873	153	105.3128305
MCA	428.424904	104	108.8604184
Other	413.140333	4659	108.9719248
Total	408.909654	64867	120.0733616

Source: SPSS Analysis

Table 8 shows mean scores with standard deviation of graduation backgrounds of the applicants with respect to the marks obtained by the applicants out of 800. Mean marks of BE applicants are higher, i.e., 474.95 than other graduation degrees. If N > 5000, standard deviation of BBA is 107.86 which is less than BCom, BE, BSc applicants; so, BBA candidates are having more consistent marks than BCom, BE, BSc, and BA applicants.

Table 9: Correlation between Academic Background and Quantitative Marks, Verbal Marks, and Analytical Marks

Correlations

		Academic_Background
Academic_Background	Pearson Correlation	1
	Sig. (1-tailed)	
	N	64867
Qmarks	Pearson Correlation	.002
	Sig. (1-tailed)	.268
	N	64867
Vmarks	Pearson Correlation	.096**
	Sig. (1-tailed)	.000
	N	64867
Amarks	Pearson Correlation	.064**
	Sig. (1-tailed)	.000
	N	64867

** Correlation is significant at the 0.01 level (2-tailed).

Source: SPSS Analysis

Table 9 shows that the correlations of Academic Background, Verbal and Analytical Marks are significant at 0.01 level. As the correlation value of Quantitative marks and Academic background is 0.002 which lies between ± 0.29 , it is said to be a low correlation.

Mean and standard deviation of Applicants' graduation academic background w.r.t. analytical marks, verbal marks and quantitative marks.

Table 10: Case Processing Summary

	Cases					
	Included		Excluded		Total	
	N	Percent	N	Percent	N	Percent
Qmarks * Academic_Background	64867	100.0%	0	.0%	64867	100.0%
Vmarks * Academic_Background	64867	100.0%	0	.0%	64867	100.0%
Amarks * Academic_Background	64867	100.0%	0	.0%	64867	100.0%

Source: SPSS Analysis

Table 11: Analytical Marks, Verbal Marks, and Quantitative Marks versus Academic Background

		Report		
Academic_Background		Qmarks	Vmarks	Amarks
BA	Mean	18.844714	23.969458	24.775565
	N	7253	7253	7253
	Std. Deviation	21.0077665	21.5476450	19.9952630
BCom	Mean	26.106367	37.108717	36.273009
	N	18381	18381	18381
	Std. Deviation	22.2679697	21.6262421	19.5501744
BE	Mean	40.440366	46.915236	50.155536
	N	10402	10402	10402
	Std. Deviation	24.3554623	21.7861841	19.9694082
BSc	Mean	25.058119	34.058890	34.948988
	N	9280	9280	9280
	Std. Deviation	22.3269108	22.5968189	20.5311052
BTech	Mean	40.300611	49.376115	48.845379
	N	4914	4914	4914
	Std. Deviation	25.4213165	21.3677532	20.1249867
BBA	Mean	25.412624	39.154714	36.591162
	N	5076	5076	5076
	Std. Deviation	22.2764069	21.4938025	19.1354145

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BBACA	Mean	29.064583	42.472083	40.605833
	N	48	48	48
	Std. Deviation	24.0215694	20.9339319	17.8396268
BCA	Mean	20.551707	31.001489	31.855952
	N	2337	2337	2337
	Std. Deviation	20.3273333	20.6022562	18.1283134
BCS	Mean	23.049870	34.779531	35.065482
	N	768	768	768
	Std. Deviation	20.7320305	19.9522872	18.2476908
BMM	Mean	27.963806	51.059677	42.892258
	N	155	155	155
	Std. Deviation	22.3722681	18.5395752	16.7364319
BMS	Mean	31.457019	48.103727	43.918199
	N	1288	1288	1288
	Std. Deviation	21.7816493	18.8846809	16.6769170
BSc-Biotechnology	Mean	12.500000	16.660000	25.410000
	N	1	1	1
	Std. Deviation			
ME	Mean	38.336042	47.895833	48.372500
	N	48	48	48
	Std. Deviation	23.4598106	20.7226370	17.9776622

Report

Academic_Background		Qmarks	Vmarks	Amarks
MTech	Mean	40.684510	49.404706	46.710915
	N	153	153	153
	Std. Deviation	22.1955673	20.9526135	18.6795367
MCA	Mean	29.708269	40.815288	43.867885
	N	104	104	104
	Std. Deviation	23.5817390	19.5399818	19.5535878
Other	Mean	25.913960	41.519860	39.262108
	N	4659	4659	4659
	Std. Deviation	22.0004885	22.3066582	19.5688209
Total	Mean	28.375776	38.232695	38.259191
	N	64867	64867	64867
	Std. Deviation	23.7447286	22.8663879	21.0946280

Source: SPSS Analysis

Table 11 shows mean scores with standard deviation of graduation backgrounds of the applicants with respect to the marks obtained by the applicants in Analytical reasoning, Verbal skills, and Quantitative skills.

If we check in quantitative skills column, mean marks of B.E. applicants are higher, i.e., 40.44 than other graduation degrees. If $N > 5000$, standard deviations of BBA, BCom, BSc and BA are in the range 21 to 22.33. Standard deviations of BBA, BCom and BSc are around 22.30. Standard deviation of BA is 21.01 which is less than BCom, BE, BSc and BBA Applicants; so, BA candidates are having more consistent quantitative skills marks than BCom, BE, BSc and BBA applicants.

If we check in verbal skills column, mean marks of B.E. applicants are higher, i.e., 46.92 than other graduation degrees. If $N > 5000$, standard deviations of BBA, BCom, BE and BA are around 21.63. Standard deviation of BBA is 21.49 which is less than BCom, BE, BSc and BA applicants; so, BBA candidates are having more consistent verbal skills marks than BCom, BE, BSc and BA applicants.

If we check in analytical reasoning column, mean marks of BE applicants are higher, i.e., 50.16 than other graduation degrees. If $N > 5000$, standard deviations of BBA, BCom, BE and BA are around 19.56. Standard deviation of BBA is 19.14 which is less than BCom, BE, BSc and BA applicants; so, BBA candidates are having more consistent analytical reasoning marks than BCom, BE, BSc, and BA Applicants.

Investigate if Academic grade/class and academic background has Significant Impact on Total Marks

We have set hypotheses to check if it has any impact on marks obtained in the ATMA exam.

Hypotheses

H_1 : There is a significant Impact of academic grade on Total Marks.

H_2 : There is a significant Impact of academic background on Total Marks.

Variables Entered/Removed^b

Model	Variables Entered	Variables Removed	Method
1	Academic_Background, class ^a		Enter

a. All requested variables entered.

b. Dependent Variable : Total 800

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.273 ^a	0.75	0.75	115.5136142

a. Predictors: (Constant), Academic_Background, class

ANOVA^b

Model	Sum of Squares	df	Mean Square	F	Sig.
1. Regression	69706853.384	2	34853426.692	2612.036	.000 ^a
Residual	8.655E8	64864	13343.395		
Total	9.352E8	64866			

a. Predictors: (Constant), Academic_Background, class

b. Dependent Variable: Total 800

Coefficients^a

Model	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
1. (Constant)	491.721	1.469		334.824	.000
Class	-38.163	.542	-.269	-70.355	.000
Academic_Background	.698	.117	.023	5.949	.000

a. Dependent Variable: Total 800

Hypothesis Testing – H1: There is a significant Impact of Class on Total Marks.

The hypothesis H_1 tests if class carries a Significant Impact on Total Marks. The Dependent Variable Total 800 was regressed on predicting variables class to test the hypothesis H_0 . Total 800 significantly predicted class, $F(2,64864) = 2612.036$, $p < 0.001$, which indicates that the class can play a significant role on Total 800 marks ($B = -38.163$, $t\text{-value} = -70.355$, $p < 0.001$). Moreover, the $R^2 = 0.075$ depicts that 7.5% of the variance in Total 800.

Hypothesis H_1 stands accepted. Hence, there is a significant Impact of Class on Total Marks.

Hypothesis Testing – H2: There is a significant Impact of academic background on Total Marks.

The hypothesis H2 tests if academic background carries a Significant Impact on Total Marks. The Dependent Variable Total 800 was regressed on predicting variables Academic Background to test the hypothesis H2. Total 800 significantly predicted Academic Background, $F(2,64864) = 2612.036$, $p < 0.001$, which indicates that Academic_Background can play a significant role on Total 800 marks ($B = 0.698$, $t\text{-value} = 5.949$, $p < 0.001$). Moreover, the $R^2 = 0.075$ depicts that 7.5% of the variance in Total 800.

Hypothesis H₂ stands accepted. Hence, there is a significant Impact of academic background on Total Marks.

The Findings can be summarized as under:

1. Out of 100% of the ATMA applicants, 20.571% have distinction, 39.509% have First Class, 34.155% have Second Class and 5.766% have Pass Class in their graduation.
2. ATMA exams are not only attempted by the fresh graduates but also by experienced people. Around 21.28% male and 18.48% female applicants (Total: 39.76%) have industry experience.
3. For the Applicants who attempt ATMA exam, the result is declared out of 800 and in percentile format. So, 12.29% male and 10.72% female applicants have got marks Greater than or Equal to 550 whereas 37.75% male and 43.79% female applicants have got marks Less than 550 and Greater than 400, 49.96% male and 45.49% female applicants have got marks Less than or Equal to 399.
4. Mean scores of verbal and analytical marks are 38.23 and 38.25 respectively, which are almost the same and Mean score of quantitative marks is 28.38. Thus, ATMA applicants scored better in verbal and analytical sections than quantitative marks.
5. Standard deviation of analytical marks is 21.09 which is lesser than quantitative and verbal marks. Thus, ATMA applicants are having more consistent marks in analytical reasoning than the verbal marks and quantitative marks.
6. There is a strong correlation between quantitative, verbal, and analytical marks.
7. Female candidates are having more consistent marks than male candidates.
8. Mean total marks of B.E. applicants are higher, i.e., 474.95 than other graduation degrees, where $N > 5000$.

9. BBA candidates are having more consistent marks than BCom, BE, BSc, BA and applicants, where $N > 5000$.
10. Academic background has low correlation with quantitative, verbal, and analytical marks.
11. ATMA applicants must concentrate on quantitative reasoning, as all the graduation degree applicants are having less marks compared to verbal and analytical skills.
12. There is a significant Impact of class and academic background on Total Marks.

Conclusion

This paper examined several factors that can potentially check student aptitude performance in the ATMA entrance exam. Number of techniques were used to provide answers to the research questions of interest. Researchers have attempted to study the relevance of aptitude testing for admission to MBA/ PGDM, to find relationship between academic scores and entrance test scores, as well as to estimate the impact of graduation stream to entrance test results through this paper.

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Decentralized Municipal Solid Waste Management: Case Study of a Fast-Developing Satellite Township

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Abstract

The quantity of municipal solid waste (MSW) is increasing and the rapid increase in population and development activities in satellite towns developing near mega and metropolitan cities are aggravating this problem of MSW. The current study presents a detailed scenario regarding MSW management (MSWM) in one such township in north India. Based on an in-depth qualitative study, it proposes a decentralized model of MSWM as a financially and environmentally sustainable alternative. It demonstrates that the collection, segregation, and processing of bio-degradable MSW in small municipal blocks facilitates the reuse and recycling of 70% of MSW within the city itself. The model demonstrates that in contrast with large MSWM projects, this intervention saves the transportation cost and hassles, and prevents the dumping of waste at a single centralized landfill site, which takes away a large area of urban local bodies, which could be put to use for other productive purposes.

Keywords: Urbanization, Segregation, Recycling, Compost, Role of Rag Pickers.

Introduction

The ever-rising population, along with rapid urbanization and industrialization, directly affects the amount of urban municipal solid waste (MSW) generated (Singh & Sharma, 2002; Minghua et al., 2009). MSW includes household garbage and rubbish, street sweeping, construction and demolition debris, sanitation residues, trade and non-hazardous industrial refuse, and treated bio-medical solid waste (Joseph, 2002). The quantity of MSW is increasing due to the increase in population and rapid urbanization (Sharma & Shah, 2005; Central Pollution Control Board (2004).

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The mismanaged and unscientific disposal of waste deteriorates the nearby environment, causing severe implications on air, soil, and water pollution (Srivastava & Ismail, 2014). In this way the MSW if not managed properly proves to be the biggest polluter of the environment, it not only pollutes the geosphere but also the atmosphere and hydrosphere. Thus, the scientific and professional management of MSW carries the utmost importance. The quantity of MSW generated depends on living standards, the extent and type of commercial activity, eating habits, and season (Kaushal & Varghese, 2012). The day-to-day construction activity in the city also generates a large number of residues and demolition waste, which also becomes part of MSW. As the waste workers or households segregate only a negligible amount of waste, this increases load pertaining to handling, transportation, and storage in the landfill sites.

Given the fact that only limited studies are available on the status of municipal solid waste management (MSWM) in small and medium but fast-developing satellite townships in India, it is imperative to study innovative models and interventions implemented in such municipalities. It is also important to examine the impact of different experiments that are being conducted by governments and municipal bodies regarding MSWM. The present study attempts to document one such innovative approach adopted in a satellite township in northwest India to manage its MSW through a non-traditional and decentralized model. It offers an opportunity for replication of this model in other towns and cities not only in India but also in other countries, which are at a similar stage of socio-economic development.

The remaining article is structured as follows. Section 2 outlines a review of the literature in the area of MSW. Section 3 describes the objective and Section 4 presents the methodology. Section 5 presents an overview of the context and the situation in which this study has been undertaken. Section 6 comprises the findings and discussion and Section 7 documents pertinent recommendations based on the findings. The article concludes with the conclusion in Section 8.

Review of Literature

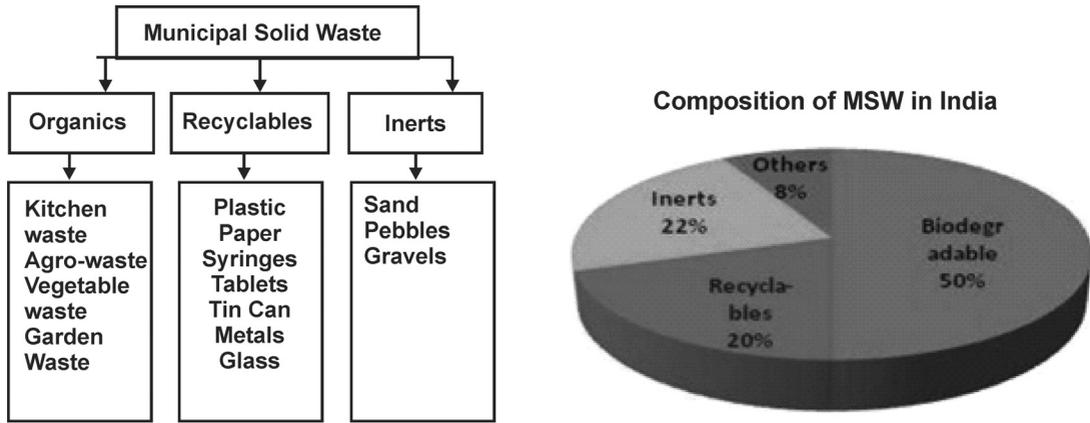
Management issues w.r.t. MSW have been studied worldwide by Schubeler (1996), Bhojar et al. (1996), Asnani (2004), Hanrahan, Srivastava, & Ramakrishna, (2006), Karak et al. (2012), Hashimoto (2016), etc. Several researchers have studied MSWM issues in Asia (Zhu et al., 2008; UN-Habitat, 2010). If Ali et al. (2014) carried out studies on open dumping of MSW and its impact on soil, then recycling of MSW has been studied by Aggarwal and Vivek (2009). Further, Pappu et al. (2007) studied recycling aspects of solid waste and Ohri and Singh (2010) studied GIS-based transportation system

planning for MSWM. Joshi and Ahmed (2016) reviewed the status and challenges of MSWM in India.

The rise in urbanization is a major reason for the increase of MSW in our cities and towns; worldwide experience has confirmed that wherein the urban population increased more than 25%, the process of urbanization and the concerned development activities also increased commensurate with it (Kumar & Gaikwad, 2004). The population in the urban areas of India has increased from 18% (1961 Census) to 31.2% (2011 Census). As per the Planning Commission Report (2014), there are 377 million urban people which amounts to around 32% of the total population generating 62 million tons of MSW every year. The figure is expected to reach 165 million tons in 2031 and 436 million tons in the year 2050.

In India majority of the urban local bodies administering essential services do not prepare any action plan for MSWM (CPCB Report, 2013); only 70% of the total generated solid waste is collected, thus leaving the remaining 30% unattended. A meager quantity of approximately 12.45% waste is processed and the remaining waste is dumped in the open landfill sites (CPCB Report, 2013). Rao and Shantaram (1993), Bhide and Shekdar (1998), and Kansal (2002) have reported that small towns in India have paid more attention to MSW treatment than larger cities. The Ministry of Housing and Urban Development, Government of India has indicated that 50 to 60% of the MSW accounts for wet and biodegradable waste and the other half is non-biodegradable (Fig. 1). The major problem in the cities and towns is that the least amount of attention is given to the segregation of MSW and also to the construction and demolition waste, polythene, plastic, commercial and industrial waste (Buenrostro & Bocco, 2003). Insufficient financial resources, inefficient working staff, and shortage of qualified manpower, and the political will usually become the bottlenecks in the Integrated Solid Waste Management (ISWM) in small and medium towns (Patel & Meka, 2013).

Figure 1: Types of MSW Generated Composition of MSW in India



Despite a large number of studies at the national and international levels, the problem of MSWM is still alarming in developing countries. Huge requirement of financial resources, land requirement, operation and maintenance expenses, capacity limitations, and poor financial condition of urban local bodies (ULBs), lack of public awareness, poor enforcement of applicable laws/by-laws are some of the key challenges. It is observed that SWM is not only an administrative issue but is a multi-faceted issue/problem to be solved by taking into account its various facets. It is neither a simple collection, transportation nor processing of waste, but a complete chain management process of logistics, scientific treatment, and storage.

The MSWM has various stakeholders, i.e., policymakers, public representatives, municipal workers, rag pickers, and municipal authorities. In this way, it also becomes a social as well as an economic issue. There is a need to design the ISWM system in such a way that it will maintain a balance of social, environmental, health, institutional, technical, financial, and legal issues to provide sustainability to the system (van de Klundert & Anschutz, 2001). As SWM requires a sizeable amount of funds, a self-sustaining model is the need of the day. The MSWM has also become a legal issue in India with the introduction of MSW Rules of 2016 by the Union Ministry of Environment, Forest and Climate Change, Government of India. Since the process of SWM is also scientific, hence more and more research is required to tackle it. Above all, a lot of awareness is required for sustainable SWM.

Several studies have confirmed that the re-use of Solid Waste is a good option for an efficient MSWM (Kasseva & Mbuligwe, 2000) and is equally helpful from a social, economic, and environmental point of view (Kasseva & Gupta, 1996, Misra & Pandey, 2005; Schoot Uiterkamp, Azadi, & Ho, 2011). True sustainability occurs at the intersection of all three dimensions (i.e. environmental performance, social performance, and economic performance (Carter & Rogers, 2008) but all stakeholders involved i.e. government, local community, and industry (Marshall & Farahbakhsh, 2013) must understand the need for sustainable solutions (Rebehy et al., 2017).

MSWM Studies for Punjab

MSWM studies specific to the state of Punjab in India, where this study has been undertaken are generally not available except for a few attempts by Punjab Pollution Control Board and Punjab State Council for Science & Technology, Jerath et al. (1995, 2011, & 2014), Tiwana et al. (2005, 2007), Jain, et al. (2007), Singh, et al. (2012), etc. None of these studies, however, specifically focuses on fast-developing cities and townships.

ISWM through Cluster Approach

ISWM in its simplest sense incorporates the waste management hierarchy (Turner & Powell, 1991) by considering direct impacts (transportation, collection, treatment, and disposal of waste) and indirect impacts (use of waste materials and energy outside the waste management system). It is a framework that can be built to optimize the existing systems as well as to design and implement new waste management systems (UNEP, 1996, 2002). ISWM is also a process of change that gradually brings in the management of wastes from all media (solid, liquid, and gas) Pimenteira, et al. (2005). ISWM represents a contemporary and systematic approach to solid waste management. The U.S. Environmental Protection Agency (EPA) defines ISWM as a complete waste reduction, collection, composting, recycling, and disposal system. An efficient ISWM system considers how to reduce, reuse, recycle, and manage waste to protect human health and the natural environment.

Decentralized MSWM

The decentralized model of MSWM involves the management of municipal waste by various small waste management centres close to waste generation points within a locality. This allows PPPs (Public-Private Partnerships) at the unit level where micro-entrepreneurs/NGOs/SHGs/CBOs can work with the urban local bodies (ULBs) either

directly or through a private partner who manages the waste collection as well as bio-mining/ reclamation/maintenance of existing landfill sites. This model was adopted as a pilot project in the Kharar township of Punjab, and the present study examines the various facets associated with this project.

Objectives of the Study

In this study, MSWM of a fast-growing township of Kharar in Mohali district of Punjab province in India is discussed. The study is conducted to develop an understanding regarding the implementation of decentralised MSWM practices in a satellite township of a large city in northwest India to generate specific alternatives for collection, segregation, and treatment of MSW. The study also aims to examine the role of rag pickers and waste workers, ascertain the possibility of segregation of waste at the initial stage, recycling of organic and biodegradable materials within the city, the sale of inorganic materials directly to the buyers rather than its dumping in the landfill and to examine the social and economic impact of the waste management system upon various stakeholders.

Method

This study examines in detail the existing scenario of MSWM in Kharar and proposes suggestions to carve out a strategy for a sustainable solution to manage the MSW in an efficient, professional, and business-like manner. A qualitative research design was adopted for the present study. A thorough study was undertaken to examine the mechanism and process of MSWM adopted by the MC Kharar. For collecting the primary information several meetings were undertaken with various stakeholders i.e. Public representatives, MC authorities, waste collectors, and rag pickers. Comprehensive meetings were conducted with the Executive Officer, Chief Sanitary Inspector, Municipal Engineer, Accounts Officer, representative of sweepers, and the President of Rotary Club Kharar. Open-ended unstructured in-depth interviews were conducted with these officials and people directly involved in the MSWM for the city of Kharar. Along with that, data was also obtained from secondary sources to supplement the primary data for the study.

The Setting

MSW in Punjab

Punjab is a small state in the northwest of India but because of high population density (550 individuals/square Km) and relatively higher affluence from the rest of the country,

the generation of MSW is high. As per the Department of Local Government Punjab sources, there are 167 cities and towns, having 13 corporation towns, 21 class 1 cities, and the remaining municipal councils (MC) and *Nagar panchayats* (Table 1). Presently around 35 percent of the state population is living in urban areas. There are 10 major cities with a population higher than 1 million (2011 census) with Ludhiana being the most populated city (population >1.6 million as per the 2011 census (estimated to be > 2.0 million in 2021), followed by Amritsar and Jalandhar.

Table 1: Solid waste generated in 167 ULBs of Punjab

Total Urban Population (Census 2011)	9.88 million
Total No. of Urban Local Bodies (ULBs)	167
Municipal corporations	13
Municipal Councils	101
Nagar Panchayats	53
Total No. of Wards	3123
Total MSW generated	4550 TPD
Wet waste generated (50%)	2275 TPD
Recyclable/dry waste generated (30%)	1375 TPD
Commercially non-recyclable (15%)	682 TPD

Source: Punjab Municipal Infrastructure Development Company, Local Govt. Deptt. Punjab, 2020

MSW in Township of Kharar

The township of Kharar was selected for this study because the city is adjoining to Chandigarh (Union Territory), which is also the capital of the two states, i.e., Punjab and Haryana that is also the major reason for its fast growth. Since it is the first city while entering the State of Punjab from the Chandigarh side, it is known as the gateway to Punjab. Another factor, which goes in its favor, is that it is one of the main cities of GMADA (Greater Mohali Area Development Authority), which is constituted on the pattern of the national capital region (NCR) New Delhi, the capital of India.

In India, a lot of migration is taking place from the rural to the urban areas. Similarly, in the state of Punjab, most of the high-income group people want to shift and settle in Chandigarh, which is known as 'City Beautiful' and has the honor of being the first planned city of India after its independence. In the last two decades, there was a big spurt in real estate prices in Punjab and also in Chandigarh and its adjoining areas. Most of the people, who wish to migrate to Chandigarh, because of unaffordable land prices, prefer to settle in Mohali or Kharar because of which there has been an exponential population growth of Kharar. As per the last three censuses undertaken by the Government of India, its population in 1991 was 26,109, which increased to 39,410 in 2001 and eventually rose to 74,460 in 2011. Thus, there was around a 50 percent increase in population between 1991 and 2001 and an increase of 90 percent between 2001 and 2011. As per Municipal Council Kharar records presently, there are 52,000 households in the city, thus by taking into account five persons per household, the population of the city comes around to be 2,50,000, which is an astonishing increase of 240% in one decade between 2011-2020.

The Kharar township is administratively divided into 27 wards, with each ward being represented by an elected Municipal Councilor. Around 20,000 town residents live in the old walled city of Kharar and the remaining areas are newly carved and developed in the last 50 years. Besides, there are 22 duly registered Resident Welfare Associations (RWAs) one each for 22 gated residential and commercial accommodation/multistoried housing clusters. Most of such localities are developed haphazardly, without any proper planning. 14 villages with a population of 1500-2000 each are also part of the city because of the extension of municipal boundaries from time to time. The MSWM system in the villages is conventional, which is in vogue since old times. The people living in the villages store household waste, street sweepings, agriculture waste, and cow dung waste in the low-lying areas which automatically convert into compost after about a year. This compost is rich in nutrients to be used in gardens, landscaping, horticulture, and agriculture. In this way, the nature and characteristics of MSW also differ across the different localities of Kharar city.

With explosive population growth within such a brief span, MC Kharar is unable to provide quality municipal services of water supply, sewerage systems, and waste management to its residents. The lack of resources with the municipality in terms of finance, manpower, and qualified professionals has created a mammoth task to manage MSW professionally and scientifically. Kharar township is currently managing its solid waste on its own, employing a conventional approach and also incorporating some additional initiatives. MC has only 5 Tractor-Trolleys, 6 Hoppers, 8 Dumper Placers,

and 2 JCBs for transportation of waste from various localities to the Municipal landfill site.

Results and Discussion

Before the onset of MSW Rules 2016, the indiscriminate dumping of entire MSW generated daily in the cities across Punjab has created a mammoth challenge in front of authorities not only to deal with fresh waste incoming daily but also the legacy waste dumped for years together. Similar has been the situation for the Kharar township. MC Kharar operates a dumpsite with approximately 6 acres of area, which has been filled with garbage having height up to 20 feet from ground level with a rough estimation of 0.25 million MT of waste. The inadequate capacity to intake mixed garbage at the dumpsite along with non-compliance with SWM Rules 2016 has made the matter bad to worse for the city authorities and its residents.

Background

The State of Punjab (India) took a challenging initiative, the first of its kind in the country, by adopting an ISWM program in a cluster approach. All the cities and towns in the state were divided into 8 clusters, namely Ludhiana, Jalandhar, Amritsar, Bathinda, Patiala, Faridkot, Gamada, and Pathankot. Each cluster comprises a big city and 15-20 small and medium cities around it. The ISWM project report was conceptualized on behalf of the Department of Local Govt. Punjab and PMIDC (Punjab Municipal Infrastructure Development Company) and was prepared by the consultants IL&FS (IDC), New Delhi. The project was executed on Public-Private Partnership (PPP) mode, on a turnkey basis, i.e., right from door-to-door collection, segregation, transport, processing, and storage of remaining waste in the scientific landfill sites one each for every cluster of cities. Though this project was initiated in the year 2007-08, till 2019 only 5 clusters were allocated to different companies. However, it was observed by the government that the waste management in the allocated clusters was not up to the mark leading to litigation and arbitration to solve the dispute between the private parties and the state government authorities. Hence, the state government decided to think afresh for an alternate solution to the problem by way of decentralization of SWM in the state.

The Pilot Project

The Department of Local Government, Punjab, vide its Gazette Notification July 9, 2018, decided to decentralize the MSW process in its cities and towns with a population of less than half a million each. Before going ahead with a state-wide launch of this

initiative, it was decided by Department of Local Government, Punjab, that a pilot project for decentralized MSWM be executed at one of the MCs of the state. Punjab Municipal Infrastructure Development Company (PMIDC) a non-profit company formed by the government of Punjab was assigned the job to conceptualize and develop an execution plan regarding this. PMIDC selected the township of Kharar to run a pilot project for having a finer understanding of the various dynamics.

Based on the in-depth unstructured interviews with Chief Sanitary Inspector, Kharar, and Senior Assistant Manager (SWM), MC Kharar, the following observations regarding this unique initiative were recorded. An integrated Composting and Material Recovery Facility (MRF) having 60x45 ft dimensions was constructed to provide segregation cum composting unit. A mechanical composting facility with a capacity of 5 tonnes of waste to be processed per day was also installed. Presently, it serves 10% of the total population of the city. As far as the expenditure upon it is concerned, the civil construction work cost was around Rs.3.5 million (about USD 50,000) and the mechanical processing machinery and other miscellaneous items cost was another Rs.1.5-2.0 million (about USD 20,000). In this way, the total expenditure upon the entire processing unit for processing 5 tons of organic waste into compost per day is around Rs.5-6 million (about USD 70,000), excluding the cost of land, which was already owned by MC Kharar.

Constituents of MSW at Kharar

In order to have a finer understanding of the composition and major constituents of MSW for the Kharar township, a sampling exercise was undertaken. 5 samples of 50 kg each of MSW were collected from ten different areas of Kharar city. Upon its proper segregation, it was found that MSW of the city comprises organic/vegetable/kitchen waste (51%), inert (24%), plastic and polythene (9%), paper (5%), cloths (4%), rubber/lather (1%), glass (1%), and miscellaneous waste (5%). Based on the sampling during the survey, it was also observed that on an average the MSW generation per person per day in Kharar township comes to be around 0.5 kg. Hence, with a population of 2,50,000 residing in the city, there is an estimated MSW generation of around 125 tonnes every day.

Role of Rag Pickers

The MSW in the city of Kharar is being dealt with and managed by the conventional paraphernalia i.e., the sweepers, informal ragpickers, and the sanitary inspectors being further administered by Executive Officer and elected representatives. As per Municipal Council Kharar sources, there are 277 sweepers and waste workers

employed through outsourced agencies. The outsourced employees collect the solid waste from primary and secondary points and load it into transporting vehicles further to the cart and unload it at the landfill site.

The door-to-door collection of garbage/waste in the selected areas is owned and operated by the informal sector. The residents in most of the localities dispose of their household waste in the nearby collection points on their own or through waste collectors. Around 200+ ragpickers are working privately on their own or under some private contractors for the collection and segregation of recyclable items in the city. Most of the informal waste collectors and rag pickers engaged in MSW collection are found to be migrant laborers who are not conversant with local conditions or languages. The private contractors earn a major profit from the sale of segregated recyclable materials with a small share being given to the ragpickers. During field visits and investigation it was found that 60% of the rag pickers collect waste from residential areas, 20% from markets, restaurants, and commercial areas, 5% from bus stop areas, and 15% from offices, educational institutions, and other areas.

For managing the affairs at MRF, the MC has collaborated with informal waste collectors/rag pickers who deposit the biodegradable waste separately at some designated points in their areas from where MC vehicles carry it to the MRF facility for processing. They sort and remove recyclables, which they sell separately to the waste contractors. Thus, the MRF gets biodegradable and organic waste for processing into compost. The remaining waste including wet waste and other organic materials are carted to municipal landfill through MC's vehicles.

The MRF Operations

The MSW collected at MRF is further sorted manually on segregating tables to remove the non-biodegradable contaminants, metal, plastic, recyclables, if any from the MSW transported to the MRF site. After that, the biodegradable waste is shredded and mixed with bulking agents (sawdust and finished manure) to regulate the moisture content and Carbon: Nitrogen (C: N) ratio of the manure. The bulking agent not only controls the odor from the fresh wet waste but also provides enough air space for the activation of microbial growth. After a 12-day composting cycle, semi-finished compost loses half of its initial moisture. Further curing for another month is done by making a compost pile on the floor. More than 60°C temperature is recorded inside the compost pile, an active phase of microbial action occurs even after the 25th day. Presently under this pilot project, the MC authorities are processing only one ton of biodegradable waste converting it into organic compost every day.

After the completion of curing, the compost is sieved using mechanical sieving machines for uniform size. The rejects from the sieving machine get utilized as bulking agents. The sieved compost is packed in the gunny bags for end-use to be sold in the market. It was observed that on an average 70% of the total waste of a designated area having 10% of the city population is managed at this point. The mechanical composting adopted under this project not only emerged as a waste to wealth approach for MC Kharar, but the sanitary landfill site is also burdened with only thirty percent waste as compared to the past deposition of the waste from that area. Now, all the biodegradable and organic waste is processed and the recyclables are recovered within the city, thus solving around more than seventy percent of MSWM problems for 10% of the total city population.

Meeting with Key Stakeholders

For having a holistic view regarding the MSW, meetings were conducted with various Kharar MC officials: Executive Officer, Chief Sanitary Inspector, Municipal Engineer, Accounts Officer, representative of Sweepers, and President, Rotary Club Kharar. The following major points for the MSWM in the township of Kharar emerged from the discussion with various stakeholders.

The President Rotary Club Kharar recommended that in order to attain further improvement there should be a comprehensive awareness program for the city residents for MSWM, mainly the segregation at source needs and the guidelines and provisions of SWM Rules 2016 should be undertaken. This can be executed with the help of public representatives and members of local social enterprises like the Rotary Club, other NGOs, and educational institutions. The representative from the sweeper's wing suggested that the public at large should be made aware to minimize the generation of waste and its reuse up to the maximum possible extent. This is in line with the philosophy that amongst '3Rs' of waste management, i.e., Reduce, Reuse, and Recycle; 'Reduce', which means to cut back on the amount of MSW being generated, is the top-ranking component of the Solid Waste Management hierarchy. This is because it represents the most effective means of reducing economical costs and environmental impacts associated with handling waste (Henry & Heinke, 1996).

The Accounts Officer, MC Kharar, proposed that an affordable fee for availing MSWM services should be charged from all households for financial sustainability. Similarly, the institutional, commercial, and industrial units should pay as per the area of their premises at a nominal rate. The Chief Sanitary Inspector argued that the MC should make arrangements for the segregation of the collected waste within the city itself

and bio-degradable waste, e.g., kitchen waste and horticulture waste, etc., should be converted into compost, etc.

The sweeper wing representative demanded that the wages to sweepers and rag pickers should be commensurate with the services rendered by them. It was reported that they collect the waste from certain localities, segregate the recyclables and search out the valuable articles to be handed over to the contractor who pays them a negligible amount for working around 8 to 10 hours a day, which comes to Rs.200-250 per day. It was also suggested that MC should purchase the recyclables, e.g., polythene, paper, bottles, and glass, etc., from the ragpickers, to avoid their exploitation from private contractors. MC can then sell these items to waste dealers/contractors.

The Municipal Engineer Kharar suggested that a separate plan to deal with the demolition waste generated because of construction activity in the city should also be made. This will not only help in curbing the mixing of demolition waste with MSW and avoid its dumping at the landfill site, but also this material can be used for productive purposes like manufacturing bricks, pavers, etc.

Thus, the different stakeholders were found to be looking at the same problem from a different lens and were proposing different solutions. The civic society organizations were suggesting a comprehensive awareness program; sweepers were calling for minimizing the generation of waste, purchase of recyclables by MC, and decent wages; finance officials were suggesting the imposition of a fee; MC officials were finding a solution in the segregation of the waste within the city itself. Therefore, it's a multifaceted problem, which requires a multi-pronged approach.

Recommendations

Based on the findings, the following recommendations are being made:

Decentralized and cluster based approach: This decentralized and cluster approach as per the MC's pilot project can be replicated in other parts of the township, as well as in other towns and cities of Punjab and India. The waste collectors and rag pickers can collect segregated waste from each household. In case unsegregated waste is received, segregation can be done by bringing it to the designated decentralized collection centers. Collection and transportation activities account for approximately 80-95% of MSWM's total budget; therefore, it is a key element in determining the economy of the entire MSWM system (Agrawal, 2017). There is a direct and indirect link between the emission of Greenhouse Gases (GHGs) and wastes generation, as well as

management. Wastes contribute to the GHGs emission levels and the inexistence of an efficient waste management system only exacerbates the level of emission from this source (Abila, 2014). Therefore, it is suggested that one cluster cum processing unit having the complete collection, segregation, and processing of biodegradable and organic waste can be established for every five wards of MC, each serving around a population of 40,000 people.

The wet organic waste will be processed in the mechanical composting unit for producing compost at those points only, and the recyclables recovered from the waste viz. polythene, plastic, glass, steel items, cloths, pet bottles, and hard paper, etc. will be put into different compartments made at each center. In this way, on average waste collectors or rag pickers will have to travel a maximum of 2-3 kilometers of distance for collection, segregation, storage, and processing of MSW. Their efficiency will increase and the overall expenditure including that upon the transport vehicles for the carriage of MSW from various localities to the landfill site will decrease.

These centers could be set up on the land pockets already owned by Municipal Council. An average of 70% waste of the designated segment will be looked after and managed at those points. The remaining 30% of the MSW comprising mainly the inert material will be carted to MC's landfill site. The proposed recommendations and strategy will reduce the collection and transportation expenditure and also the emission of Greenhouse Gases (GHGs). It will also help in saving a large amount of valuable urban land being used for land-filling, as 70% of MSW will be reused and recycled within the city before reaching the landfill site.

The MC authorities should ensure that recyclable materials segregated and collected at every collection cum processing unit should be carted from these collection points at least once a week to the main stores of the municipal council, further to be sold directly to the waste contractors. The sale of recyclables collected and compost/manure adds certain funds to the MC financial exchequer. A recent study of six Indian cities found that waste pickers recovered approximately 20% of waste, with 80,000 people involved in recycling approximately three million tonnes. It is estimated that every tonne of recyclable material collected saved the ULB approximately INR 24,500 per annum and avoided the emission of 721 kg CO₂ per annum (Annepu, 2012).

Financing model: According to Royal Society Open Science, March 2017, finance for waste management companies and funding for infrastructure must be raised from waste producers through a waste tax and an average charge of Re.1 per person per day would generate close to Rs.500 billion annually and this level of funding would

probably be sufficient to provide effective waste management throughout India. The MSWM Rules 2016 also emphasize the provision of fees for availing SWM facilities in the bye-laws of urban local bodies. In this way the polluter pays principle should be applied and the MC authorities could levy an affordable fee of Re one per person, per day for each household as MSWM fee in Kharar city. Similarly, this waste management fee should also be levied upon the commercial and industrial units as a win-win situation. It will not only add to the financial exchequer of the Municipal Council but will also create public participation in the whole process.

Demolition waste management: The Government of India has also formulated Construction and Demolition Waste Management Rules 2016. On account of fast development at the satellite townships, a large amount of construction activity takes place therein around the year. The demolition waste and residue should be carted and sent to the nearby units for recycling and manufacturing bricks, interlocking tiles and road kerbs, etc., on buyback condition for development works being executed by MC Kharar in the city. It will avoid its dumping in the sanitary landfill site of Municipal Council Kharar.

Localised awareness campaigns: The municipal corporations should undertake a massive and continuous exercise to create awareness amongst the general public regarding SWM Rules 2016 and the best practices in other cities and towns of India. There is a dire need for awareness in the community and its participation in the whole process of sustainable SWM by engaging students from educational institutions and volunteers through social enterprises.

Conclusion

This study highlights that the problem of MSWM is not of that magnitude that it seems to be. The general belief is that the lack of financial resources and technical know-how with the urban local bodies is the major reason behind inefficient MSWM. However, in case MSW is handled with an appropriate, scientific, and business-like approach, the best available and sustainable results can be achieved. The role of various stakeholders in ISWM requires it to be recognized. The waste workers are still considered an inferior class in Indian society, whereas they are the real warriors to keep our cities clean and pollution-free. This detailed analysis of MSWM in Kharar would help in proposing a model for effective management of waste in similar small and medium but fast-growing towns and cities of India.

The solution proposed in this study would also be useful in guiding other MCs and Municipal Corporations to significantly reduce their expenditure on MSWM. It will also be helpful to provide a clean and up to a certain extent, pollution-free environment for the city residents. The segregation of MSW at the source is observed to be the foremost requirement of MSWM. The reuse and recycle of segregated waste is a tool of resource recovery and further helps in environmental protection and job creation. The compost is found to be the best possible option to process the biodegradable and organic form of MSW.

Since the generation of MSW is an important by-product of never-ending socio-economic activities, continuous efforts should be made for more and more research in the field of MSWM specifically to create zero waste cities. It will only be possible in case the total quantity of MSW generated is segregated, recycled, and reused. Every characteristic of MSW should become a resource for some other use meeting the demand of ecology and economy in total.

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Effect of Talent Retention Strategies on Intention to Stay: An Empirical Study of Insurance Sector

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Abstract

The purpose of the paper is to investigate the effects of talent retention strategies on the intent to remain of a sample of insurance sector employees. The current descriptive research was done on a sample of 396 working employees from the insurance sector in Punjab (India). A purposive sampling method was used to choose the respondents. PLS-SEM (version 3.32) was used to test hypotheses. Findings of structural equation modelling indicated that the talent retention strategies; appreciative learning and working climate, compensation & benefits, and work-life balance were positive and significant. The findings also revealed that work pressure and learning attitudes were negatively associated with the intent to remain. This study is unique as it is the first that examined theoretically and empirically the influence of talent retention strategies on intent to remain on a sample of insurance employees.

Keywords: Talent retention strategies, appreciative learning, and working climate, compensation & benefits, work-life balance, work pressure & learning attitudes.

Introduction

Today's insurance sector is constantly confronted by developments such as technological advancement, globalization, and increased worldwide competitiveness. Aside from economic evolution, insurance firms are also under pressure from demographic shifts. Demand for talent will rise as a result of demographic changes, but supply will fall. As a result, (Fishman, 1998) a "war for talent" is anticipated to arise. Keeping top personnel has always been, and will continue to be, critical to an organization's survival and growth. The retention of talent has become a top concern for businesses all around the world. Retaining talent is thus a top concern for businesses, particularly in service-oriented industries like insurance (Ohunakin et al.,

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2018), where staff and customers engage on a one-on-one basis. The importance of keeping talent is heightened by the loss of experience and client connections, as well as the continuity of customer service and knowledge. General employee, turnover costs are significant, ranging between 100 percent and 150 percent of an employee's base salary, and include replacement costs associated with hiring, separation costs, loss of productivity (Abbasi & Hollman, 2000; Huang & Cheng, 2012), and development costs due to a scarcity of talent (Cohen & Golan, 2007; Nagarajan & Thangavelu, 2016). Each voluntary movement costs approximately 25 percent to 33 percent of the person quitting's annual salary (Bitzer, 2006). Insurance companies must consider practices used during daily operations to retain a talented workforce to avoid unnecessary employee turnover rates. This study will investigate talent retention strategies in the insurance sector that influence the intention to stay such as the appreciative learning & working climate, compensation & benefits, learning attitude, work pressure, and work-life balance.

Review of Literature

Intention to stay

In comparison to the intent to quit or leave, staying is not a popular research variable. A survey of existing studies reveals that the bulk of the literature focuses on intent to quit/leave (Spreitzer & Mishra, 2002; Allen, 2006). Tett and Meyer (1993) defined "intention to stay" as an employee's cognisant and deliberate willingness to stay with the organization, hence the possibility of remaining in her or his current job". Though, earlier literature has also used the term "intention to stay" as an alternative to elucidate "employee retention" (Ajzen, 1991; Ellenbecker, 2004; Coombs, 2009). The term "intention to stay" is more suitable in this study (Punia & Sharma, 2008; Rashid & Zhao, 2009) because of the problems encountered by organizations in retaining their talented employees.

Talent

In general, talent refers to the skills, talents, and art that an individual possesses in a specific subject. It also refers to individuals with high potential, limited knowledge, and competence, who are capable of effectively bringing about revolution and change inside an organization. Simonton (1999) defined talent "as an innate capability that enables a person to exhibit extremely high performance in a field that requires special skills and training". Bexell & Olofsson (2005) defined, "talent is a scant resource, like capital, which can flow freely, seeking its best uses and greatest rewards". As a result, if workers continue to learn and are adaptable, they will be able to go wherever they

want and demand the money, opportunities, and working circumstances that they choose.

Talent retention strategies

Appreciative learning and working climate (ALWC)

ALWC concept is derived from prior studies (Kyndt et al., 2009; VanHamme, 2009; Abrams et al., 2008; Birt et al., 2004; Visser, 2001). Generally, it refers to the environment in which the workforces learn and work. Since then, ALWC have become vital for retaining talent (Rodriguez, 2008; Michaels et al., 2001). Appropriate retention strategies are grounded in the consideration of the influences that affect whether or not the workforce quits or remains, particularly noting that learning and working climate have a positive relation with the intention to stay (Govaerts et al., 2011). Insurance sector employees' intention to remain with the organization depends on both personal and contextual factors.

H1: Appreciative and learning and working climate will positively and significantly effect the intention to stay

Compensation and benefits (CB)

Compensation and benefits are referred to as financial rewards such as pay and bonuses. A salary is the monetary compensation that an organization gives for work well done, and it usually reflects the worth of the work or talents. According to Parker & Wright (2001), money has a significant influence on employees and wages influence on workforce retention. Therefore, the service sector should implement the policies to attract a capable pool of workforce, retain knowledgeable employees, and preserve equity among the organization's personnel. Employees will stay longer in a company if they are treated fairly and equally, according to Mercer (2003), and they will leave if they are not treated fairly or treated poorly. Horwitz et al. (2003) found that salary and reward are still one of the most significant and influential factors of retaining talent in a research. Tessema and Soeters (2006) found in their study that a compensation package was significant and positively correlated with the intent to stay. A higher remuneration plan, which should be internally equal and externally competitive, is one way to keep skilled staff in the business. Compensation plans should include competitiveness, market-related pay, and perks since this encourages employees and acts as a positive reinforcement to keep them.

H2: Compensation & benefits will positively and significantly effect the intention to stay.

Learning attitude (LA)

Learning attitude and additional employee personal characteristics are associated with high potentials. High potential workers are identified by top management as having the ability to perform executive functions. Numerous qualities are attributed to these high potentials: creativity, leadership qualities, autonomy, and learning potentials (Snipes, 2005; Dries & Pepermans, 2008). As a result, the more willing a worker is to learn and the more innovative ideas he or she employs, the more likely he or she is to continue with the company (Govaerts et al., 2011). In the latter instance, if an employee does not believe his or her learning attitude is beneficial in the current work and organization, he can choose to quit; but, if they do appear to matter, he is more likely to remain and opt to advance within the company.

H3: Learning attitude will positively and significantly effect the intention to stay

Work-place pressure (WP)

Workplace pressure is described as the sense of high workplace expectations that never seem to go away, such as tight deadlines that workers struggle to meet. Work pressure is conceptualized as a cognitive-energetic condition of the human being that results in the sensation of strain or felt pressure, which is linked to the incomplete and expected completion of work duties. It is now best understood as a subjective representation of an employee's physiological and psychological condition while doing job activities. This condition can change, and work pressure can increase or decrease, based on the worker's expectations for the quantity of work that remains to be done and his or her judgement of the likelihood of successfully completing the job. Workplace stress appears to be a more persistent condition that may extend into people's free time. Workplace stress is prevalent in today's workplaces (Andries et al., 1996). Some of the research studies have inspected the negative association between work pressure and intention to stay (Kyndt et al., 2009; Pillay, 2009).

Work pressure is provisionally conceived as a cognitive-energetic state of the person, producing the experience of strain or felt pressure, which is associated with the ongoing and anticipated execution of work tasks. At present it can best be understood as the subjective reflection of the person's psychological/ physiological state while carrying out work tasks. Obviously, this state can vary and work pressure can augment or decline, depending on the worker's expectation of the amount of work that remains to be done and his/her assessment of the chance to accomplish the work successfully. Although work pressure is conceived as a dynamic phenomenon, one would expect it to change less

quickly than work load. Work pressure seems to be a more enduring state which may extend into people's leisure time.

H4: Workplace pressure will negatively and significantly effect the intention to stay.

Work-life balance (WLB)

Extent to which an employee is equally interested and happy with their career and family responsibilities is referred to as work-life balance (Cascio, 2000). Existing literature highlighted the concept of work-family balance (Lewis & Campbell, 2008) and later on, the focus shifted to work-life balance. WLB as assistance or working condition sponsored by organizations that help a workforce to balance (Cascio, 2000) between work and family demands. WLB policies should enable workforce to improve their standard of life by allocating more time to leisure activities, family responsibilities, training programs, and relaxation or social activities. Insurance sector can use a variety of methods to improve work-life balance among their staff, including time management practices, offering spatial flexibility to the workforce, time reduction strategies such as part-time work, shared work and maternity and paternity leave beyond the official amount.

Work-life balance positively correlated to worker's work satisfaction, organizational commitment, increasing intention to stay, and family operation, while the negative correlated to stress level, lower organizational commitment, less work satisfaction, domestic violence, turnover intention and lower productivity (Ollier-Malaterre, 2010). Similarly, the significance of work-life balance and its relation with retention has been comprehensively studied across many fields (Mescher et al., 2010; Lewis & Campbell, 2008). Some of the research studies have shown positive correlation among WLB and intention to remain between nurses (Eley et al., 2014), or among managers (Cegarra-Leiva et al., 2012).

H5: WLB will positively and significantly effect the intention to stay.

Method

Research design

The statistical data for this paper was collected using a cross-sectional method. A survey questionnaire is a typical tool for collecting data from a large number of participants in social science research (Sekaran & Bougie, 2013). SPSS 20.0 version software was used to conduct initial analyses such as demographic characteristics of

participants and multicollinearity. This paper used PLS-SEM version-3.32 to gain a better understanding of the predicted connections.

Profile of respondents

Participants in this study were the workforces of insurance companies. The majority of the respondents were male (n=325, 82%) but there was sufficient representation of female employees also (n=71, 18%). Around 56% of participants were from the public sector and the remaining 44% were from the private insurance sector. Age-wise, the bulk of participants were found to be between 30 to 40 years old (n=316, 79.8%) followed by less than 30 years (n=72, 18.2%) and only 2% were above the age of 40. Experience wise, 96% had experience below 10 years and only 4% of the respondents had more than 10 years of experience. Around 82% of the participants had been working with their present organization for less than 5 years, whereas around 14% had been working for the last 6 to 10 years. Only 4% of employees had been working with their current employer between 11 to 15 years. Education-wise, 4% were diploma holders, 62% were graduates, 30% were post-graduates, and the remaining 4% had other types of qualifications. Branch wise, 45 were in life-insurance and 55% in the general insurance business (See Table 1).

Table 1: Respondents' profile

Variable	Categories	Count	%
Gender	Male	325	82.1%
	Female	71	17.9%
Sector	Public	220	55.6%
	Private	176	44.4%
Age	Below 30 years	72	18.2%
	Between 30 to 40 years	316	79.8%
	above 40 years	8	2.0%
Total Experience	below 9 years	380	96.0%
	Between 10 to 20 years	16	4.0%
Experience with the present organization	Below 5 years	326	82.3%
	Between 6 to 10 years	54	13.6%
	11 to 15 years	16	4.0%
Education	Diploma	16	4.0%
	Under-graduate	246	62.1%

	Post-graduate	118	29.8%
	Others	16	4.0%
Branch	Life Insurance	178	44.9%
	General Insurance	218	55.1%

Materials

To measure the talent retention strategies, an instrument was developed based on a vast literature survey (Pillay, 2009; Govaerts et al., 2011) which consisting of five dimensions; appreciative learning and working climate (5 items), learning attitude (3 items), workplace pressure (3 items) adapted from a scale of Govaerts et al. (2011) and compensation & benefit (3 items), and work-life balance (3 items) from Pillay (2009) scale. Intention to stay was measured by five-item scale (Kyndt et al., 2009). The instrument had 22 statements measured on five point Likert scale.

Analytical strategy

The proposed associations were evaluated using the Smart PLS 3.32 version, which was created by Ringle et al. (2005). PLS path modeling may be evaluated and understood in 2 stages model: The first is measurement model and the second is the structural model (Henseler et al., 2009). The connection between observed items and latent constructs is analyzed through a measurement model. In addition, the study's measurement model looks at the latent variables' reliability and validity. In contrast, the structural model used the boot strapping approach to investigate the path connections between the latent components, observing the importance of the path coefficient and R² values.

Results and Discussion

Assessment of measurement model

It's crucial to check whether the variables are measuring what they're supposed to measure before studying the relationships between them. In doing so, the outer loadings/factor loadings of the items, CR, AVE, and discriminant validity of the measuring model were investigated.

An item's reliability was defined as the correlations among the indicators and their respective constructs, as evaluated by the items' outer loadings. As shown in Figure 1, 22 items have a verified loading value of greater than .50. As shown in Table 2, the composite reliability value for each latent construct ranges between 0.912 and 0.957, which is consistent with (Hair et al., 2014) rule of thumb. As a result, the measuring model has been deemed trustworthy. Table 3 reveals that the latent construct VIF

value is less than five, indicating that there was no multi-collinearity between the exogenous variables. As a result, the present study investigated the measurement model's validity by looking at convergent and discriminant validity. For determining the convergent validity, the AVE value of each latent construct should be used as the criterion proposed by Fornell and Larcker (1981). Table 2 revealed that the values ranged from .776 to .886, which is higher than the AVE cut-off value .50 suggested by Chin (1998). As a result, the measurement model is validated at a convergent level.

Table 2: Quality Criterion for reflective model assessments

Constructs	Items	Factor loadings	Alpha value	CR	AVE
Appreciate Learning and Working Climate	ALWC1	0.890	0.946	0.957	0.816
	ALWC2	0.888			
	ALWC3	0.932			
	ALWC4	0.912			
	ALWC5	0.895			
Compensation and Benefits	CB1	0.864	0.858	0.912	0.776
	CB2	0.917			
	CB3	0.861			
Learning Attitudes	LA1	0.951	0.934	0.955	0.877
	LA2	0.938			
	LA3	0.920			
Work-life Balance	WLB1	0.949	0.932	0.957	0.881
	WLB2	0.942			
	WLB3	0.924			
Workplace Pressure	WP1	0.959	0.936	0.959	0.886
	WP2	0.943			
	WP3	0.921			
Intention to stay	ITS1	0.897	0.938	0.952	0.800
	ITS2	0.914			
	ITS3	0.880			
	ITS4	0.913			
	ITS5	0.868			

ALWC= Appreciative learning and working climate, CB= Compensation and Benefits, LA=Learning Attitude, WLB= Work-Life Balance, WP= Workplace Pressure and ITS= Intention to Stay.

Table 3: Result of Measurement Model

Constructs	Dimension	VIF	R ²
Appreciate learning and working climate	5	1.307	— —
Compensation & Benefit	3	1.724	— —
Learning Attitude	3	1.535	— —
Work life Balance	3	1.558	— —
Workplace pressure	3	1.244	— —
Intention To Stay	5	— — — —	0.184

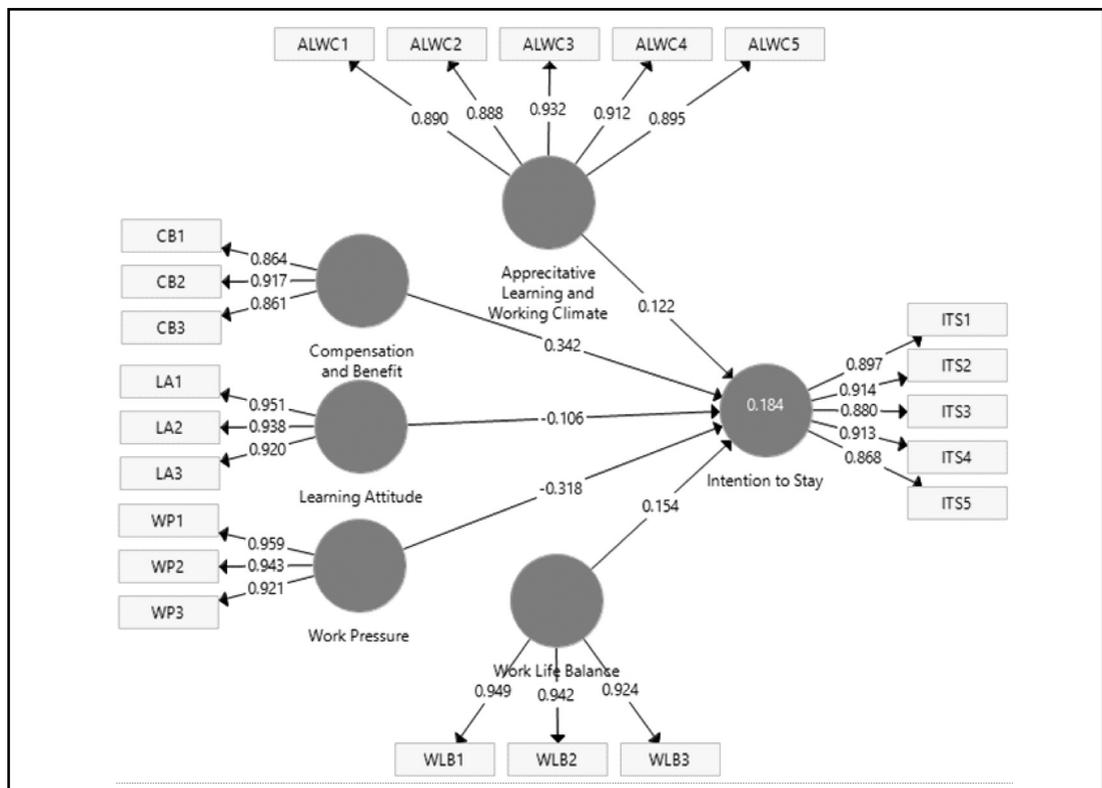


Figure 1: Measurement Model (PLS Algorithm)

Furthermore, by evaluating the discriminant findings of the Fornell-Larcker criterion, this investigation verified the uniqueness among the latent variables. As proposed by Henseler et al. (2009), the Fornell-Larcker criterion should be used to assess discriminant validity. Table 4 shows that the AVE square root of all latent variables on

the diagonal side is larger than the correlation value of each latent construct with other research variables, indicating that all latent constructs in this paper are different from one another. As a result, the measurement model proved the latent variables' convergent and discriminant validity.

Table 4: Fornell-Larcker Criterion

ALWC	CB	LA	WLB	WP	ITS
ALWC 0.903					
CB 0.344	0.881				
LA 0.338	0.534	0.936			
WLB 0.378	0.526	0.472	0.938		
WP 0.354	0.367	0.236	0.286	0.941	
ITS 0.149	0.291	0.115	0.239	-0.131	0.895

ALWC= Appreciative learning and working climate, CB= Compensation and Benefits, LA=Learning Attitude, WLB= Work-Life Balance, WP= Work Pressure and ITS= Intention to Stay.

The effect of talent retention strategies on intent to stay shown in (Figure 1). R2 values of 0.02, 0.13, and 0.26, according to Cohen (1988), should be regarded as weak, moderate, and significant, respectively. The value of r square which is derived from the PLS output and shows that the independent variable (talent retention strategies) has the tendency to influence 18.4% in the dependent variable (intention to stay).

Results of structural model

The current study used bootstrapping to examine the connection between exogenous and endogenous latent constructs after assessing the measurement model. The significant findings of the independent and dependent variables were presented in Figure 2. The study's findings (see Table 5) revealed that three independent factors, namely appreciative learning and working climate, ($\hat{\alpha}=.122, p<.001$), compensation and benefits ($\hat{\alpha}=.342, p<.001$) and work-life balance ($\hat{\alpha}=.154, p<.001$) had a positively and significantly relate to intent to stay. Work-pressure had a negative and significant impact related to the intent to stay. All the hypothesized relationships (see table 5).

Table 5: Structural Model Result

Hypotheses	Relationships	($\hat{\alpha}$)	S.E	t- Values	p- Values	D
H1	ALWC->ITS	0.122	0.048	2.555	0.011	Supported
H2	CB-> ITS	0.342	0.058	5.842	0.000	Supported
H3	LA-> ITS	-0.106	0.057	1.853	0.064	Not Supported
H4	WP ->ITS	-0.318	0.052	6.115	0.000	Supported
H5	WLB-> ITS	0.154	0.065	2.374	0.018	Supported

ALWC=Appreciative learning and working climate, CB=Compensation and Benefits, LA=Learning Attitude, WLB=Work-Life Balance, WP=Work Pressure, ITS=Intention to Stay.

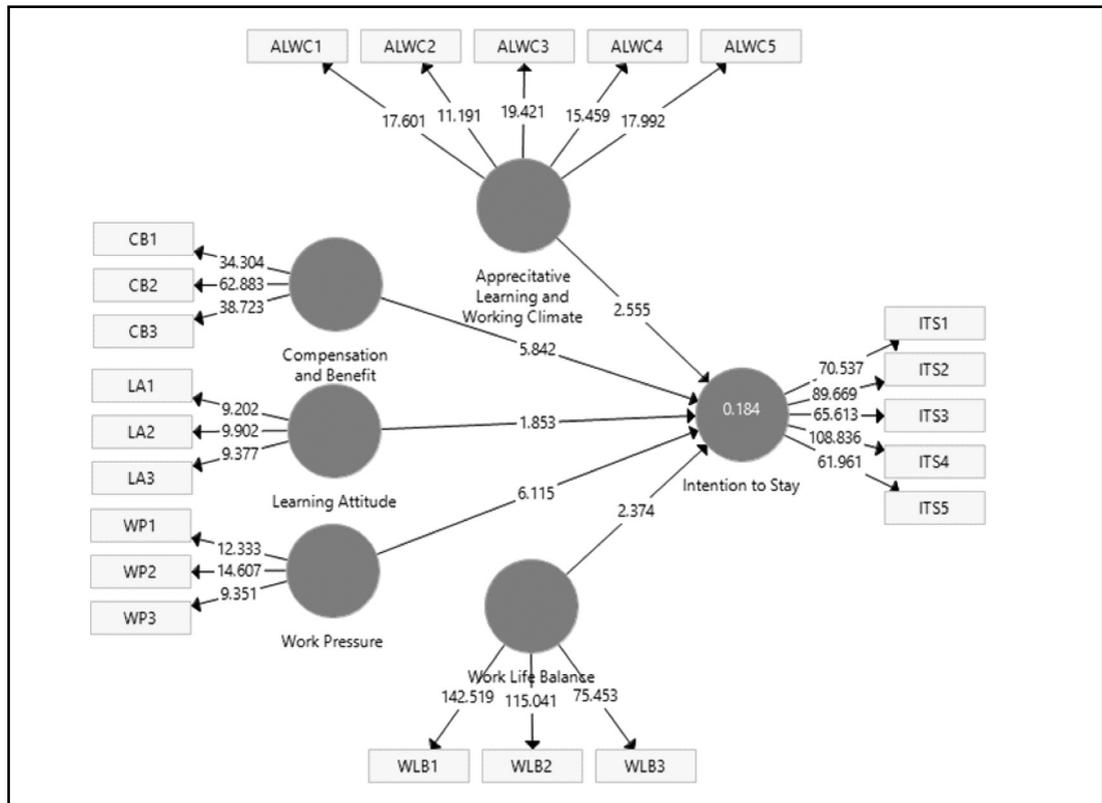


Figure 2: Bootstrapping

The aim of the study is to identify the predictors of intention to remain in insurance workforce. The findings of PLS-SEM showed that talent retention strategies namely appreciative learning and working climate, compensation and benefits, and work-life

balance were positive and significantly associated to intention to remain while work pressure and learning attitude were negatively correlated which is consistent with SET. CB (compensation and benefits) has a high b-coefficient ($\hat{\alpha}=.342$, $p<.001$) which shows that it has a strong predictive value for the intent to remain and confirmed the previous research findings (Osibanjo et al., 2014), work-life balance has a higher b-coefficient ($\hat{\alpha}=.154$, $p<.001$) which shows that it has a high predictive value for the intent to remain and confirming prior study findings by (Eley et al., 2014; Deery & Jago, 2015; Aamir et al., 2016).

Employees in the insurance industry who lack a WLB are more likely to feel tiredness and burnout, as well as an increased desire to leave. Another factor ALWC construct has a b-coefficient ($\hat{\alpha}=.122$, $p<.001$) which indicated that an “appreciative learning and working climate” has a strong predictive value for the intent to remain. This was in accordance with predictions and supported prior research findings by (Govaerts et al., 2011 and Abrams et al., 2008). This indicates that employees who have appropriate learning chances inside their organization and feel valued by their superiors and co-workers are more likely to continue with the organization. But learning attitude has a negative and insignificant impact on Intention to remain ($\hat{\alpha}=-.0106$, $t=1.853$), and result confirmed the previous research by Kyndt et al. (2009).

The more willing to learn, people are less likely to stay with the current employer. This keenness to gain knowledge of, which is also usually connected with talented employees, leads to reduce the intention to stay. The pressure of work factor has shown a negative and significant relation with intent to stay ($\hat{\alpha}=-0.318$, $p<.001$) and confirms the previous study by Kyndt et al. (2009). It shows that having effective retention strategies in the workplace sends powerful signals to workforce that they are respected, appreciated, and recognized within their companies.

Limitations and future direction

The present study limitation is that both individual and organizational factors are considered through the employee's perceptions. The second limitation is that all of the participants were from one sector, whose specific context can affect the generalizability of these results. Another limitation is that the survey instruments were completed freely by the participants, so the author had no idea about those who did not participate. The researcher suggests that detailed talent retention models for various organizational contexts be combined in future studies. It's also crucial to figure out whether retaining talent entails discriminatory practices and lower added value for the firm.

Conclusion

Organizations all over the globe strive to keep competent and informed workers since their departure results in a loss of competitive advantage in the form of tacit knowledge. This form of knowledge is critical in the service industry, particularly in insurance firms, where experienced and skilled workers are critical to the company's success. Overall, it can be concluded that managers and human resources practitioners should consider how learning and working climate, work-life balance, and compensation and benefits are associated with the intent to remain of the insurance employees as part of their talent retention strategies. The absence of these factors, on the other hand, will enhance the desire to quit. This study indicated that when insurance companies desire to keep their talented workforce for a longer period, it is essential to focus on the compensation, WLB and learning.

A worker in the insurance sector who has a good work-life balance has fewer work-family clashes, which leads to an increased satisfaction levels; a pleased worker is more dedicated, has a lower turnover intention, and performs well. As a result, work-life balance strategies not only improve satisfaction level but also enhance the likelihood of staying with the present organization. Employees working in the insurance sector that experience learning and working climate in their companies are more inclined to retain in that industry. And human resource managers make sure that rewards and benefits circulated to the workforce are dynamic and constantly re-evaluated to ensure transparency and fairness to all employees, ensuring their continued loyalty, dedication and commitment, which is the most important drive for a pleased insurance workforce, reducing turnover while ensuring talent retention.

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Factors Affecting Academic Stress among Undergraduate Students

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Abstract

Stress begins when there is a gap between the demand and the individual capacities to fulfill the demand. Academic Stress is the situation in which students feel tensed and pressured which includes anxiety and anger. Academic Stress also leads to physiological, emotional and behavioral changes. Stress has now become a general topic in the academic world as well as in our society. As the students are the Leaders of Tomorrow it is the basic need of today's educational institution to create a balanced academic environment for better learning of the students. Today the high expectations of the parents, teachers, peers, relatives and oneself, leads to academic stress. Therefore, this paper investigates the factors that influence academic stress amongst undergraduate students in higher institutions. A structured questionnaire was designed to collect the data. A sample of 300 students was collected from the cities of Chhatisgarh in India. The study identified 14 factors influencing Academic Stress of undergraduate students.

Keywords: Academic, Education, Institutes, Stress, Undergraduate Students.

Introduction

Stress is a part of everyone's life which is difficult to avoid in certain situations. Now-a-days the School/Colleges/Universities have taken initiatives to outline the personality of students. The role of educator has become more significant. Various roles are expected from the teacher, i.e., of parent, friend, guide and the motivator. As the students travel out of their native place to get better education, they expect the role of a supporter and philosopher from their teachers. But when the expectations of the students are not fulfilled, it leads to a great source of stress among the students. The term 'stress' is generally used either to tag situations that tax a person's physical or psychological resources or to refer to the emotional reaction of the person to such situations.

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Bernstein et al. (2008) defined “stress as a negative emotional, cognitive, behavioral and physiological process that occurs when a person tries to adjust to or deal with stressors”. Lazarus (1966) defined “Stress as a feeling of tension that is both emotional/physical, it can accrue specific situation different people perceive different situations differently”. Academic stress is a type of stress which normally takes place due to the additional work more than the capacity and capability in terms of examination, academics or content matter in some particular class. Some researchers divided stress into four major categories based on the source, i.e., personal, financial, relational and occupational. Personal source relates to personality structure, life experience, self concept and issues linked to the individual. Financial source relates to the economic and financial status, income and ability to pay bills. Relational source relates to interaction with others, e.g., family, relatives, neighbors, spouse and friends. Occupational source involves experiences related to work and career.

Bisht (1989) has defined academic stress as “a demand related to academics that tax or exceed the available resources (internal or external) as cognitively appeared by the student involved”. The study also found that academic stress tells about the individual’s *academic frustration, academic conflict, academic pressure and academic anxiety*. *Academic frustration* occurs when academic goals are harmed; *academic conflict* arises when two or more equal but incompatible response tendencies to academic goals; *academic pressure* increases when demand of time and energy to meet academic goals is high; and *academic anxiety* is apprehension of harm to some academic goals. Richlin-Klonskly & Hoe (2003) found that harsh and unlimited stress prevents students to enjoy college life, reduce academic performance and increase the chances of substance abuse and unconstructive behaviors.

Many researchers observed the adverse effects of academic stress on students’ personal, emotional, and physical well-being and also on their learning and performance levels (Scrimin et al., 2015; Hofericher et al., 2014; Liu and Lu, 2012; and Liu and Lu, 2011). Schafer (1996) found that regular study, papers writing, exam preparation and boring teachers were the major academic-related stressors. Carveth, et al. (1996) revealed that in today’s environment extensive knowledge base is required from the students and they didn’t get enough time to develop it which increases stress amongst the students. Blain and McArthur (1961) highlighted psychological problems reported by students - dislike towards the course, inability to learn foreign language, uncontrollable tension, frustrating or disappointing love affair, illness of a close family member, lack of appreciation, unwillingness to be what others want him/her to be and revenge against parents/teachers. A college education is stressful for students in many ways

as it is the sudden transformation from high school to college life. For some students, separation from home may be a reason for stress and for some others personal growth.

Bhujade, (2017) defined “Stress as the psychological state which derives from the person’s appraisal of the success with which he or she can adjust to the demands of the social environment.” Rentala et al. (2019) studied adolescent girls and found a positive relationship between educational stress and religion, father education, number of siblings, a combination of subjects, type of personality and Intelligent Quotient. According to Fairbrother & Warn (2003), competition among students, poor relationships with peers and lecturers are the result of failures and stress in the students. Chawla and Agrawal (2021) found a moderate level of academic stress in higher secondary students. The study also revealed that the ratio of stress among male students is higher in comparison to female students and the students of Government schools have lesser stress compared to private school students. The education level of parents also affects the academic stress and the students whose parents have literate level face higher stress than their counterparts.

Review of Literature

Trigueros et al. (2020) highlighted the positive relationship of emotional intelligence with resilience and negative relationship with test anxiety and academic stress. The author also found that test anxiety and academic stress were negatively related to the Mediterranean diet. Allen et al. (2019) concluded that resilience plays an important role in the academic field. It develops social, academic, and personal skills, and helps the student to come out of unpleasant situations. Prabhu (2015) studied the stress of students with different variables and revealed that level of academic stress in higher secondary students is reasonable. The academic stress level of male students is higher compared to female students. The urban students’ academic stress is more compared to rural students. The Government school students’ academic stress is less compared to private school students. The science subject student’s academic stress is more compared to arts students. The academic stress students whose parents are literate is higher in comparison to their counterparts.

Kaur (2014) concluded that the mental health of teenagers is very much influenced by academic stress. In the current situation parents do not guide the adolescents properly which may be because either they are uneducated or they are over-busy in their professional work. It is clear from the study that academic stress puts a negative impact on the mental health of adolescents irrespective of their gender and level of stress. Bataineh (2013) observed that factors like academic overloads, course awkwardness,

inadequate time to study, workload of every semester, exam awkwardness, low motivation, and high family expectations are the moderate level stressors among the students. The study also highlighted that the main cause of stress in the undergraduate students is fear of failure. In addition, the study revealed a positive link between religious sources and academic stress. Finally, the study found in significant differences in academic stress among students with different levels of study and specializations.

Deb et al. (2014) observed high academic stress amongst all the students but, the students with lower rank have higher levels of stress compared to higher rank. Exam anxiety is high amongst the students who involved in extra-curricular activities than those who did not involve in extra-curricular activities. Daily hassles can also lead to irritations, pressures, and annoyances which may not be major stressors but their collective impact can be noteworthy (Bernstein et al., 2008). Robotham (2008) concluded that 30 percent of working students, missed lectures and 20 percent failed to hand in coursework on time due to work commitments. Such an imbalance can be quite stressful and may lead to poor academic performance in the struggle to maintain one's job. The effect of stress differs for all people that give negative experiences and poor health. Hence, managing stress is essential, as it affects how people look for health care and social support and how they consider the suggestions of the professionals (Passer and Smith, 2007). Academic and non-academic institutions are different in work settings therefore symptoms, causes, and consequences of stress are not similar in the two set up (Elfering et al., 2005; and Chang and Lu, 2007).

Erkutlu and Chafra (2006) found that the strain to do better in the examination and the time pressure make the academic environment more stressful. Radcliff and Lester (2003) suggested that too much class workload, the socialization pressure, the lack of guidance, and the transition periods are the major stressors for students. McKean et al. (2000) found that only stressors are not responsible for creating anxiety, depression, or tensions. Whereas, the relationship between stressors and perception of the people and their response to the stressors cause stress. Ross et al. (1999) found many reasons for high level of stress in college students like college life adjustment, pressure of studies, force to maintain interpersonal relationships, housing arrangements and lifestyle changes. Besides these, the students experience stress related to academic requirements in college.

Many researchers highlighted the association between stress and poor academic performance (Clark and Rieker, 1986; Linn and Zeppa, 1984; and Struthers et al., 2000). The major cause of stress for an undergraduate or graduate student is examination

and examination results, studying for exams, work overload, the amount of material to learn and the need to perform well. Socio-economic factors also play an important role in determining stress and anxiety among undergraduate students. Foster et al. (1995) highlighted that during financial constraints the impact of strain on studying increases. Abouserie (1994) stated that financial problems and lack of time for friends and family also work hand in hand to make the student anxious. Moore et al. (1992) highlighted that in spite of gender, a fair level of stress drive students to enhance their academic performance during learning. Dhar (1991) emphasized that stress is a universal phenomenon, excess of which results in intense and distressing experiences. Job stress refers to a situation wherein job-related factors interact with employees to change, i.e., disrupt or enhance, his or her psychological and/or physiological condition such that the person is forced to deviate from normal functioning.

As per Wikipedia (2009), the reasons for stress among the students are lecture overload, financial problems, relationship with lecturers, heavy workload and social, environmental and cultural factors. Auerbach and Gramling (1998) argued that if the stress is not managed in a proper way then it leads to serious troubles. Chronic stress leads to physical illnesses which include heart disease and mental illness. The students experience psychological and physical problems due to negative or excessive stress (Murphy and Archer, 1996). Khan et al. (2013) proposed that parents should not put pressure on the students and should not impose their career choice on the students. Effective time management seems to lower academic stress (Misra and McKean et al., 2000).

Effective time management, social support, positive reappraisal, and involvement in leisure time are different methods through which students can lower their stress level (Murphy & Archer, 1996) by focusing one's attention on the breath, along with other physical and psychological states (Gampopa, 2000). Through this present moment practice, the individual becomes less reactive to potentially difficult circumstances, maintaining affective balance, understood as equanimity. Mindfulness meditation is still recognized in Buddhist traditions as a basis for developing balance in one's life (Wallace and Shapiro, 2006).

Objective

- The objective of this study was to explore the factors affecting academic stress amongst the undergraduate students using Academic Stress Scale as a Behavioral Assessment Tool.

Method

The Study: The Study was exploratory in nature and aimed at exploring the factors affecting academic stress amongst undergraduate students.

The Sample: This research was conducted on students of private higher education institutes in Raipur, Bhilai and Bilaspur cities of Chhattisgarh in India as the respondents. Convenience sampling was used as the sampling method (Table-1). The data was collected from 300 students of private higher education institutions in Chhattisgarh (India).

Tools for Data Collection: Student Academic Stress Scale by Busari (2012) was used to collect the data. The scale was divided into two sections. The first section consisted of questions pertaining to the demographic as well as background information. The second part of the scale included 50 items with 5 point Likert Scale on Academic stress.

Tools for Data Analysis: Item-total correlation, reliability analysis and Factor analysis were used for data analysis to identify factors which have significance in the study. Statistical Package for Social Sciences (SPSS) software was used in the analysis of primary data.

Item-Total Correlation: As the sample size was 300, item with correlation value less than 0.1948 should be dropped. All the items in the study had correlation value more than 0.1948 thus no item was dropped from the questionnaire.

Reliability Analysis: Reliability of the measure was assessed with the use of Cronbach's alpha on all the 50 items. Cronbach's alpha allows us to measure the reliability of different variables. It consists of estimates of how much variation in scores of different variables is attributable to chance or random errors (Selltiz et al., 1976). As a general rule, a coefficient greater than or equal to 0.7 is considered acceptable and a good indication of construct reliability (Nunnally, 1978). The Cronbach's alpha for the questionnaire was 0.906 (Table -2). Hence, it was found reliable for further analysis.

Results and Discussion

KMO and Bartlett's Test: KMO (Kaiser-Meyer-Olkin) Measure and Bartlett's test gave result of .852 (Table -3), which is considered suitable for Factor Analysis as per Malhotra (2007). The Factor analysis depends on the scores of KMO (Kaiser-Meyer-Olkin) which indicate the appropriateness for the same. It is also known as the Measure of Sampling

Adequacy and has values from 0 to 1. Higher values of KMO usually signify that the factor analysis is statistically suitable for data analysis and generalization. In simple words the value of KMO being close to 1 would explicate a perfect correlation between variables thus make sure that the results of factor analysis can be considered suitable. If the value of KMO is below 0.5, then it is suggested that the factor analysis is not suitable rather the researcher should try to gather more data.

Factor Analysis: There were 14 factors identified after conducting factor analysis that creates academic stress amongst the students. The 14 factors were given appropriate names based on the variables. Factor loadings and naming of the factors are present in Table-4.

Factor 1. Interest in Studies: This factor was constituted of item 30, At times I don't feel like studying (.647); item 28, I can't keep my mind on my studies (.573); item 9, I am unable to study as required (.564); item 20, I feel worried about coping with my studies (.542); item 29, I have trouble studying effectively (.532); item 33, I feel am getting low marks (.522); item 21, There is so much going on that I can't think straight (.462); item 24, I am not really sure am interested in reading (.452); item 32, I worried too much about marks to obtain in my examination (.387) and item 23, I don't have enough time in studying (.383) with a total factor load of 5.064. This factor explained 7.119 percent of variance with highest Eigen value 3.560. This is the first important factor of Academic Stress of undergraduate students of management discipline. In the present study it has been observed that many times students feel like not studying and they are unable to keep their mind on studies because they are not interested in studies. They, by and large, worried about coping with studies and find trouble studying effectively. There is so much going on in their minds that they can't think straight. Due to this imbalance, the students always fear about the marks to be obtained in the exam.

Supporting the findings of this study in the Web extract, Northern Illinois University (2014), stated that the students feel that as they didn't fulfill the expectations of their parents they are no more wanted by their parents. The parents insist their children adopt the fields which are appropriate according to them. They don't consider the opinion, interest and capabilities of their children which results in creating disinterest in the students in studies. The parent's expectations from their wards are increasing day by day. They believe that educational excellence is the only way to be successful in life. In the web extract of Mysahana (2010), it was pointed out that parents put pressure on their children to achieve those objectives which were not attained by them in their childhood. This increases the depression and stress amongst the children and it results in suicide.

Factor 2. Curriculum & Teachers: This factor was constituted of Item 44, some courses are too dull and boring (.696); item 45, some lecturers are not friendly to students. (.671); item 46, I feel lecturers are not considerate of students' feelings (.631); item 40, There are not enough good books in the library (.623); item 47, Some lecturers give unfair tests to students (.552); item 43, I feel some lecturers lack interest in their students. (.528); item 41, Too much work is required in some courses (.407) and item 42, I feel am not getting along with some lecturers (.336) with a total factor load of 4.444. This factor explained 6.341 percent of variance with eigen value 3.171. As per the present study the dull and boring lectures which are not friendly to students lead to academic stress. Students feel that some lectures give unfair tests and have lack of interest in their students. As the curriculum is not updated for a long time and does not match with the industry requirements the students are not able to get along with placements. Too much work is required to be done in some courses to make them interesting and compatible.

A popular Bollywood Indian film *Taare Zameen Par* (2007) shows that "Every child is special." In this film, a young boy performs 'poorly in school and is repeatedly neglected by his parents and teachers until the time an inspirational teacher accepts him and helps him find his inner ability. Naismith et al. (2010) stated that the students dislike the lecturer who shouts at them and they always try to miss his/her class. Therefore the teacher plays a vital role in building the interest of the students in the studies and makes them successful.

Factor 3. Concentration: This factor was constituted of Item 49, I have trouble making up my mind about my academic work (.702); item 48, I feel I have poor memory (.620); item 50, I am too forgetful and easily discouraged about academic (.604); item 27, I feel academic programme is too cumbersome for me (.388) and item 19, I feel overwhelmed by the demands of study (.296) with a total factor load of 2.61. This factor explained 5.207 percent of variance with eigen value 2.604. Many times students feel that they can't study and they even don't know the exact reason of this feeling. When forcefully they read, they don't remember and feel that they have poor memory. Students find it difficult to make up their minds about academic work and they are unable to concentrate on their studies. They easily get discouraged about academics and feel that the demand for study is too high. Therefore, concentration is the third essential factor for students' academic stress. Mood changes are common for every student. The stress levels of those students are the highest whose rate of changing mood is very fast. This changing of moods makes the students unable to concentrate on their studies. The finding of present study is supported by Busari (2012) who found

that the fear of failure, inability to concentrate and negative evaluation are the reason for depression among adolescents.

Factor 4. Class Environment: This factor was constituted of item 11, I try to avoid class if possible (.766); item 10, I have trouble concentrating in class (.720); and item 8, I am been distracted in class (.544) with a total factor load of 2.03. This factor explained 4.809 percent of variance with eigen value 2.404. The students rated class environment as a fourth factor creating academic stress. Students face problems adjusting to the environment when they move to a new place. When they come into contact with new friends they try to avoid classes. Excitement to know the new environment distracts them and they find it difficult to concentrate in the class which scores high academic stress. The academic environment becomes more stressful when there is pressure to perform well in the test or examination (Erkutlu and Chafra, 2006). Baker (2001) concluded that the students find it difficult to cope in an over-crowded environment, the number of people within the academic environment contributes to stress among students. Ongori (2007) highlighted the main stressors as overcrowded lecture hall, semester system and lack of resources to perform academic work.

Factor 5. Expression: This factor was constituted of item 25, At times am unable to express myself in words (.725) and item 26, I am afraid to speak or discuss in the lecture room (.712) with a total factor load of 1.437. This factor explained 4.373 percent of variance with eigen value 2.186. In the present study it has been found that students are afraid to speak or discuss in the lecture room. They know things better but still are unable to express themselves in words. The findings of this study supported by Dimitrov (2017) who stated that 70% of students fear communicating in the English language and they feel shy, tense and anxious to speak in front of others, 89 percent of students fear communicating in classroom activities like group discussion, case study, role play, seminars, games, etc.

Factor 6. Study Material: This factor was constituted of item 37, I feel some textbooks are too hard for (.747); item 38, I feel some lecturers are too hard for me to understand (.653) and item 39, I feel so much restless while receiving lectures (.533) with a total factor load of 1.933. This factor explained 4.326 percent of variance with eigen value 2.163. Study Material is the sixth factor resulting in academic stress amongst undergraduate students. It has been found that the students feel that study material which is available to them is too hard they are not able to understand it which makes them feel that even lectures are also too hard to understand. The students feel pressure to complete the assignments, projects and research work but the books, computers

and study material that are available in the library do not meet their requirements and they feel stressed. This finding was supported by (Murphy & Archer, 1996; Misra & McKean et. al., 2000; Awino & Agolla, 2008; and Agolla, 2009).

Factor 7. Personal Issues: This factor was constituted of item 34, I would like to stop going to school. (.675); item 36, I don't really like my course of study. (.589) and item 35, I have no stable place to study (.486) with a total factor load of 1.75. This factor explained 4.034 percent of variance with eigen value 2.017. The students feel that they don't like going to college and they also don't like the course of study. They are not able to study hard because they have no stable place to study. According to Ingul and Nordahl (2013), stressful personal life events like death in the family, death of a close friend, parents' separation, serious illness, break-up with boyfriend and girlfriend, alcohol consumption, and personal violence direct the high level of stress. Shirom (1986) found that students get stressed due to interpersonal relationships with friends and they find it difficult to adjust themselves to the social system of the institution. Chhabra and Sodhi (2011) found that students get more depressed due to lack of friends and as a result, they become adept at smoking, drinking, and substance abuse.

Factor 8. Health: This factor was constituted of item 18, I have headaches (.694); item 17, I have had a lot of trouble sleeping (.615) and item 16, My hands are sweaty with a total factor load of 1.901. This factor explained 3.895 percent of variance with eigen value 1.947. The present finding is supported by Dimitrov (2017) who stated that stress among the students lead to health problems which include muscular tension, sleeping disorder, indigestion, headache, backache, etc. Due to fear of exams, assignments, presentations students find difficulty in sleeping and then they face the problem of stress. The students come from different places and find it difficult to find a balanced diet. They eat outside food which may create health disorders like indigestion. Headache and backache are quite common among students due to which they are not able to concentrate on the classes. Dwyer and Cummings (2001) proposed that Stress highly impacts the academic performance of undergraduate students and destructively affects their psychological and physical health. Siegrist (1998) highlighted that the strong link between high amounts of occupational stress and ill health. This means that a decline in health affects individual performance.

Factor 9. Absenteeism: This factor was constituted of item 22, I miss too many of my lectures (.628) and item 31, I feel am too slow in reading compared to others (.415) with a total factor load of 1.043. This factor explained 3.385 percent of variance with eigen value 1.693. Absenteeism is a serious problem that is noticed by the college

management and the parents also. Students regularly miss many lectures and feel that they are also compared to others. Ingul and Nordahl (2013) concluded that absenteeism is the result of negative personality traits, a total number of risk factors, social anxiety, panic, and behavioural and family problems like a mother not working, having low education and living alone. The non-attendees have fewer friends, they negatively interpret things and feel unsafe, and they perceive that they are not enough healthy therefore they didn't like to attend college.

Factor 10. Psychological Factor: This factor was constituted of item 15, I have difficulty in eating (.736) and item 14, I couldn't breathe (.655) with a total factor load of 1.391. This factor explained 3.282 percent of variance with eigen value 1.641. When the students are under the stress they found problems in eating, they are not able to breathe properly which are the common psychological problems. According to Porter (1990), 60 percent of university students drop the university before completing their degree mostly in the first two years because they are not capable to manage their psychological conditions especially to cope with stress. If these psychological problems are not properly addressed by the college management then it harmfully affects college retention rates. This finding is also supported by Jimmerson et. al. (2000); Alexander et. al. (2001); and Attwood and Croll (2006) who highlighted that the common reasons of dropout from colleges are psychiatric co morbidity, low socio-economic status, and employment.

Factor 11. Memory: This factor was constituted of item 13, I have trouble remembering my notes (.652) and item 12, I use alcohol or drugs to enable me study well. (-.505) with a total factor load of 0.147. This factor explained 3.153 percent of variance with eigen value 1.577. Students can have anxious feelings, difficulty concentrating or remember because of being stressed. The use of alcohol and drugs enable them to study well. Students when coming from rural to urban areas they easily get attracted to the lifestyle of the other students. This finding is supported by (American College Health Association, 2009; Bennett and Holloway, 2014; and King, Vidourek and Singh, 2014), the study reported that the students involved in different uncertain behaviors like alcohol consumption and drugs, unprotected sexual activities, physical inactivity, poor eating and sleeping patterns

Factor 12. Emotional Issues: This factor was constituted to item 2, I feel emotional (.701) and item 3, My emotions stop me from studying (.586) with a total factor load of 1.287. This factor explained 3.111 percent of variance with eigen value 1.556. Emotions affect in many ways but parents and teachers give less importance to emotions and

focus more on academic performance. The emotion of anxiety changes the individual's behavior which results in nail-biting, teeth clenching and hand wringing. When students are not able to control his/her emotions they become stressed and in stressful situations the heart rate increases, they feel cold hands and feet (Auerbach and Gramling, 1998). An emotional imbalance did not allow the students to concentrate on his/her study well. The pressure of teachers, parents and peer groups makes the students short temper and they are unable to control their emotions and have a feeling of anxiousness, fear, depression and anxiety. Safree et al. (2010) found that depression, anxiety, and stress are negatively correlated with academic achievement.

Factor 13. Frustration: This factor was constitute of item 4, I yelled at family or friends (.707); item 6, I feel I was lazy when it came to academic work. (.530); and item 7, I procrastinated on assignments.(.458) with a total factor load of 1.695. This factor explained 3.024 percent of variance with eigen value 1.512. The finding of the present study is supported by Keinan and Perlberg (1986) who argued that frustration, anxiety and depression are the main sources of high stress. Due to the frustration students yelled at family or friends they feel lazy when it comes to academic work and they push back their assignments. Nowadays depression is a common health problem in college students. It is evidence of an individual's academic frustration, academic conflict, academic anxiety and academic pressure.

Factor 14. Academic Support System: This factor was constituted of item 5, I feel emotionally drained by academic institution (.666) and item 1, My work built up so much that I feel like crying (.555) with a total factor load of 1.221. This factor explained 2.904 percent of variance with eigen value 1.452. The last factor affecting the academic stress of students is poor academic support systems in the college. The students didn't get proper information about the exam form, internal assessment, scholarship, late fee and fee submission. The long queue for form/fee submission takes a lot of time so they are not able to manage their time for assignment submission due to which students are emotionally drained and stressed. Every student comes to college with different expectations, goals, and values; therefore, student's expectations, goals and values should be linked with that of the Institution (Goodman, 1993).

Conclusion

The objective of this study was to explore the factors affecting academic stress amongst the undergraduate students. The findings confirmed 14 factors that affect academic stress namely- *interest in studies, curriculum and teachers, concentration, class environment, expression, study material, personal issues, health, absenteeism, psychological factor, memory, emotional issues, and academic support system*. From the above research it can be concluded that the ability to manage stress is very important. The performance of the students is dependent on their ability to manage stress and those who can handle their stress effectively can perform better. The curriculum and syllabus should be updated on timely basis and should match with the requirement of industry. The teachers should prepare the lectures using new technologies that will develop the interest of the students in the studies. Academic stress should be reduced on urgent basis as it leads to suicides, aggressive behaviour or even social withdrawals.

Suggestions and Implications

The findings of this study will be helpful to the students, teachers, career counseling centers, and the administrations to organize the system in a manner that can reduce the stress on the students. The finding helps the readers to trace the main reasons of poor academic performance and academic stress. The parental pressure on the students should be decreased. The colleges should appoint more qualified lecturers to solve the problem of overcrowded lectures and adequate resources like books, computers, and internet facilities should be available so that students can submit their assignments on time. The faculty must be selected very carefully and all possible efforts should be made to develop the faculty constantly. Faculty can continuously develop by exposing itself to industrial experiences through interaction with the executives by way of training and consultancy assignments.

The management should conduct workshops on time management, stress management that helps the students to manage their time effectively. While focusing on the need of the students the college management should maintain a well-balanced academic environment which is beneficial for better learning. Today our education system is building stress and fear among the students about their future. Therefore, the education system should be improved and help the student to develop their personality rather than academics score only. The colleges should prepare ready-to-work candidates for the Industries by updating the curriculum. Regular exercise, meditation and proper routine often decrease depression and stress. Therefore, regular classes should be organized for the students. Meditation is an effective technique to quiet the mind.

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Table 1 : Case Processing Summary

		N	%
Cases	Valid	299	99.7
	Excluded ^a	1	.3
Total		300	100.0

a. Listwise deletion based on all variables in the procedure.

Table 2: Reliability Statistics

Cronbach's Alpha	N of Items
.906	50

Table 3: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.852
Bartlett's Test of Sphericity	Approx. Chi-Square	4.476E3
	Df	1225
	Sig.	.000

Table 4: Factor Analysis with Varimax Rotation (N = 300)

Factor Description	Item Load	Factor Load	Eigen Value	Percent of Variance
Interest in Studies		5.064	3.560	7.119
At times I don't feel like studying	.647			
I can't keep my mind on my studies	.573			
I am unable to study as required	.564			
I feel worried about coping with my studies	.542			
I have trouble studying effectively	.532			
I feel am getting low marks	.522			
There is so much going on that I can't think straight.	.462			
I am not really sure am interested in reading	.452			
I worried too much about marks to obtain in my examination.	.387			
I don't spend enough time in studying.	.383			
Curriculum and Teachers		4.444	3.171	6.341
Some courses are too dull and boring.	.696			
Some lecturers are not friendly to students.	.671			
I feel lecturers are not considerate of students' feelings.				
There are not enough good books in the library.	.623			
Some lecturers give unfair tests to students.	.552			
I feel some lecturers lack interest in their students.	.528	.631		

Factors Affecting Academic Stress among Undergraduate Students

Too much work is required in some courses.	.407			
I feel am not getting along with some lecturers.	.336			
Concentration				
I have trouble making up my mind about my academic work.	.702	2.61	2.604	5.207
I feel I have poor memory.	.620			
I am too forgetful and easily discouraged about academic.	.604			
I feel academic programme is too cumbersome for me.	.388			
I feel overwhelmed by the demands of study.	.296			
Class Environment				
I try to avoid class if possible.	.766	2.03	2.404	4.809
I have trouble concentrating in class	.720			
I am being distracted in class	.544			
Expression				
At times am unable to express myself in words	.725	1.437	2.186	4.373
I am afraid to speak or discuss in the lecture room	.712			
Study Material				
I feel some textbooks are too hard for me to understand.	.747	1.933	2.163	4.326
I feel some lecturers are too hard for me to understand	.653			
I feel so much restless while receiving lectures.	.533			
Personal Issues				
I would like to stop going to school.	.675	1.75	2.017	4.034
I don't really like my course of study.	.589			
I have no stable place to study.	.486			
Health				
I have headaches.	.694	1.901	1.947	3.895
I have had a lot of trouble sleeping.	.615			
My hands are sweaty.	.592			
Absenteeism				
I miss too many of my lectures.	.628	1.043	1.693	3.385
I feel am too slow in reading compared to others.	.415			
Psychological Factor				
I have difficulty in eating.	.736	1.391	1.641	3.282
I couldn't breathe.	.655			

Memory				
I have trouble remembering my notes	.652	0.147	1.577	3.153
I use alcohol or drugs to enable me study well.	-.505			
Emotional Issues				
I feel emotional	.701	1.287	1.556	3.111
My emotions stop me from studying.	.586			
Frustration				
I yelled at family or friends.	.707	1.695	1.512	3.024
I feel I was lazy when it came to academic work.	.530			
I procrastinated on assignments.	.458			
Academic Support System				
I feel emotionally drained by an academic institution	.666	1.221	1.452	2.904
My work built up so much that I feel like crying.	.555			

Motivational and Driving Factors of Women Entrepreneurship

*Kahkashan Khan**

Abstract

Globally, the rate of women entrepreneurship has been growing at more than 10 percent each year. In fact, women entrepreneurs create job/ work for themselves just as for others as well. The institutional arrangement and system for creating pioneering abilities, and giving instructions to the women have opened the entry for financial turn of events, just as in engaging the women. One can see plenty of fruitful women oriented businesses successfully venturing in India, both in social and in economic fields. There are a number of schemes started by Government of India to uplift the women. Such schemes are like National Skill Development Policy, Mudra Yojna Schemes, National Skill Development Mission, Mahila Udyam Nidhi Scheme, Stree Shakti Package, Annapurna Scheme and many more. Women entrepreneurship can be regarded as one of the most important tools to empower women in India. Still the women face gender based problems in starting and growing their ventures. This paper explores the motivational and driving factors that help women entrepreneurs in India. Random sampling technique has been used to approach 80 women entrepreneurs. The results depict that there is an important effect of pull motivation factors, and rare effect of push motivational factors on women entrepreneurs who start their business in India.

Keywords: Push Motivation, Pull Motivation, Empowerment, Globalization, Business Structure.

Introduction

As per the report given by UNDP (United Nations Development Programme), about 1 billion of people are living on less than 1US\$ per day, of which at least 70 percent are women. There is an urge to alleviate poverty especially among women, and this can be achieved by empowering women economically, through various projects and schemes that encourage and motivate them to start their own income generating venture and make them self dependent. Entrepreneurs are those peoples who create new business, innovators or creative in nature, bears risk, and enjoys most of the returns and benefits. An entrepreneur can be seen as a creative and innovative person,

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who generates new ideas of starting a venture or business. They play significant role in developing an economy. These are the individuals who have skills and take necessary initiatives to participate in current and future needs and bring new ideas to the markets. Encouraging women entrepreneurs is very essential nowadays as they have lot of potential to bring prosperity in the world.

Women entrepreneurs can be classified as inheritance entrepreneurs, partner entrepreneurs, and self entrepreneurs. Directly from the earliest starting point, man's undertaking has been for the advancement and upliftment of the general public. In the ongoing occasions, it has been seen that most significant factor adding to the improvement of the general public has been industrialization. The principles reason for all the arrangements and program is on the advancement of new business people or enterprise. In many creating economies as it is absurd to expect to build the mechanical profitability and business opportunity at that rate as that of populace development, the individuals of those creating nations chiefly relies upon agrarian segment for their occupation. Everywhere throughout the world business people have been viewed as instrumental in starting and supporting financial improvement. Aphoristically, the business visionaries in the cutting edge sense can be said to be self-starters and entryways of a business who have assembled and constituted their own associations (Dhameja, 2002; Gordon and Natarajan, 2007).

The rise of ladies on the monetary scene as business persons is a significant advancement in the liberation of ladies and making sure about them a spot in the general public, which they genuinely merited. The shrouded pioneering gifts of ladies have been slowly expanding with the developing affectability to the job and monetary status in the general public. In the last half-century one has witnessed a very mere change for women as income earners for their family. Many developing and developed countries are coming forward to promote women entrepreneurs in their country. In India, many policies and programmes have been formed for the upliftment and growth of women. The programmes like Start-Up India, STEP (Support to Training and Employment Programme) for women, RMK (Rashtriya Mahila Kosh), NMEW (National Mission Empowerment for Women), SEWA (Self Employed Women's Association), etc., have been formed for development and upliftment of women in India.

According to the report released by Ministry of Statistics and Program Implementation, through sixth Economic Census, women establish around 14 percent of the absolute business enterprises, e.g., 8.05 million out of 58.5 million business visionaries, as observed by the Vice President of India. Out of this 2.76 million women establishing

13.3% of women business visionaries work in horticulture division through 5.29 million women comprising in excess of 65 percent work in non-agribusiness part. The normal work in women claimed undertakings is pitiful 1.67. As per the recent World Bank Report, it has been seen that women entrepreneurs or women employers mostly hire women as their employees. This may be due to the type of business they are running like beauty salon, tailoring business, homemade items business, handicrafts, etc. Such women-owned businesses or firms require 1 to 2 employees per business and this may be the reason for less employment in women-owned enterprises (Swetha and Rao, 2013; Vijaykumar and Jayachitra, 2013).

The significance of women business enterprise is making different openings for work among a huge number of individuals, and government's endeavors to make, strong, create quality, and fruitful business, and to achieve innovative culture among Indian women, just as likewise persuades these women to become business people. The exploration work done before shows that the expectations of enterprising to begin business work and the choices that happen before beginning up shape the objectives, methodologies, and casing up new business venture. As business will never fire up nor will be effective, as it has gotten imperative to comprehend the persuasive variables that are related with new business creation in a nation like India, where government wants to develop, advance, sustain, and develop innovative culture among Indian Women (Khan and Dubey, 2020). It is obvious in India that there exists absence of exact research work. Its primary goal is to discover the driving persuasive components of women business people as these variables impact them into wandering into business.

Objective of the Study

The objective of this work is to explore the effect of motivational factors on women entrepreneurs venturing in India.

Factors Responsible for Women Entrepreneurship

PUSH and PULL Factors

The word Push means necessities, where women feel that the income of their family is not enough to meet their basic requirements, they are into the role of sole bread earner, and they are not able to find a suitable job for themselves. These are the factors which are generally more significant for women than men. Pull clearly signifies being drawn towards something which is attractive. Some Push factors would include like death of main bread earner of the family which would consequently generate a need to earn livelihood for the women and children in the family. Other reason may be

separation of women from their husbands. Similar to this reason may be health of the primary bread earner of the family that would force women to take a job for fulfilling the basic needs of their family and meet necessary expenses.

On the other hand, Pull factors would include financial independence which is the main end result of profits generated out of business to a great extent pulls women towards entrepreneurship. Idea to make use of existing education, talents, and skills as well as simultaneously keeping oneself busy can also be the reason for women to get attracted towards entrepreneurship. Employment generation and helping others in the society to gain economic empowerment can also be regarded as pull factor that leads to economic upgradation in the society. It has been noted that in Indian society women have always been looking to gain higher social status for themselves through their own efforts. Based on the above factors, the following hypotheses were proposed.

Hypothesis 1: There exists a significant relationship between Pull factors of intrinsic motivation and women's willingness to start a venture in India.

Hypothesis 2: There exists a significant relationship between Push factors of extrinsic motivation and women's willingness to start a venture in India.

Khan and Dubey (2020) in their paper reported that rural women agreed that there is moderate increase in their social, economic and psychological factors. The respondents agreed that there is increase in income level and reduction in poverty level after participating in microfinance services. Pollard (2006) analyzed the connection between women business people backing and accomplishment from both genuine and perceptual points of view. Women's inspirations towards business enterprise were firmly related to their view of achievement. It was reasoned that women's view of help greatly affects their pioneering business than the genuine help. Some researchers have reported that demographic variables and socio-economic conditions have a major impact on the involvement of women entrepreneurs, especially in the area of enterprise management. It has been seen that most of the women entrepreneurs take the help of their family members in order to carry out their various works and task.

The significance of rural development, Swarnajayanti Gram Swarozgar Yojna (SGSY), entrepreneurial development of Self Help Groups (SHGs), dynamics of entrepreneurship as Micro enterprises has also been observed by the researchers. Kondal (2014) reported that there is a positive impact of Self Help Groups on women empowerment in Gajwel mandal of Medak District in Andhra Pradesh. The researchers have contended that business was a strategy to build the minority and women

possessed endeavors. During the years 1977-1981, the minority claimed adventures expanded, and during a similar period, women possessed endeavors expanded by 33 percent. Some studies in Meghalaya found that a large portion of the business people were original ancestral business visionaries and more than one-fourth of them were women.

Method

A structured questionnaire was developed to gather the data from women entrepreneurs in the northern part of the nation. The questionnaires were given to the respondents by hand. The respondents were women owning small scale and independent ventures or endeavors. Biological data/information of the women taking part in entrepreneurship and persuasive variables for beginning their organizations were gathered. The questionnaire also included tested items from earlier research work done on motivation and start-ups.

The questionnaire contains 3 segments: the first segment has 9 items to gauge the characteristics (Pull) inspiring to wander creation. The 5 point Likert scale was utilized to gauge achievements. The Item "I need to become independent" had Chronbach's alpha of 0.68. The second part is comprised of 7 items to quantify extraneous (push) factors viewed as precursors for the making of business. The Item "I do not have job" had Chronbach's alpha of 0.70. The last part has 5 items to gauge the expectations. The item "I am determined to start a business in future" had Chronbach's alpha of 0.69.

Data Collection and Sampling

To fulfill the need and objective of research work, a sample of 80 respondents was randomly chosen. These 80 respondents were surveyed to find out the factors that motivate the women entrepreneurs to become entrepreneurs. The research was conducted in the northern part of Uttar Pradesh. The target population of this research work was micro and small enterprises owned by women.

Data Analysis

The information gathered has been analyzed statistically with the assistance of SPSS. The correlation coefficient estimation has been used to explore the connection between the goal to wander and autonomous factors (Push and Pull components of inspiration). Hypotheses were tested to see if there is an immediate impact of autonomous factors on women aiming to be entrepreneurs.

Regression Model

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \epsilon$$

Y= Dependent Variables

β_0 = Constant

β_1 = Beta Coefficient for Independent Variables Pull Motivation variables

X_1 = Pull Motivation

β_2 = Beta Coefficient Push Motivation

X_2 = Push Motivation

ϵ = Error

Results and Discussion

Demographic Factors of Respondents (Women Entrepreneurs)

Demographic information of the respondents in terms of age, education, marital status, and work experience is given in Table 1.

Table 1: Demographic factors of respondents

Demographic factors	Number of Respondents	Percentage
Age		
25 to 35	32	40%
36 to 45	25	31%
46 to 55	19	24%
56 to 65	04	05%
Total	80	100%
Education		
Post Graduation	03	4%
Graduation	24	30%
Diploma/Certificate	33	41%
Intermediate	12	15%
High School	08	10%
Total	80	100%

Motivational and Driving Factors of Women Entrepreneurship

Marital Status		
Married	36	45%
Unmarried	21	26%
Divorced	08	10%
Widowed	05	06%
Not Indicated	10	13%
Total	80	100%
Work Experience		
Yes	56	70%
No	24	30%
Total	80	100%

Most of the women entrepreneurs are well educated, as nearly 30 percent of women entrepreneurs are graduates and 41 percent are having diploma or certificate course. A total of 71 percent have a good academic knowledge. The data also showed that women entrepreneurs were experienced, educated, as well as young. Education plays an important role in one's life and educated people tend to be more innovative and creative, and they always keep on searching for something new. It can be inferred from the above table that educated and experienced women are more inclined to become entrepreneurs than those who are less educated and inexperienced. Women in the age group of 25 to 35 years and 36 to 45 years are more inclined towards becoming entrepreneurs than those in other age groups.

Table 2: Showing Business Structure of Participating Women Entrepreneurs

Business Structure Variables	Number of Respondents	Percentage
Size of the Business (Number of Employees)		
Oneself/Myself	21	26%
Between 2 and 4	27	34%
Between 5 and 10	19	24%
Between 11 and 25	08	10%
Between 26 and 50	05	06%
Total	80	100%

Industry		
Retail Business	50	62%
Wholesale Business	12	15%
Services Industry	03	04%
Food Industry	08	10%
Agriculture	04	05%
Herbal Products	03	04%
Total	80	100%
Legal Status		
Sole Proprietorship	71	89%
Partnership	09	11%
Total	80	100%

Table 2 depicts that 89 percent of women are doing their business as sole proprietors and only 11 percent in partnership, and 62% of women are engaged in retail business, while very few of them are engaged in the businesses related to agriculture, herbal products, or service industry. The data also depicts the size of the business owned and managed by women entrepreneurs.

Table 3: Showing Information about Business Start-Ups

Information about Business Start-Ups	Number of Respondents	Percentage
Start Up Funding		
Personal Savings	60	75%
Bank Loans	08	10%
Relatives and Friends	12	15%
Total	80	100%
Having Experience		
Unemployed	10	13%
Self-Employed	50	62%
Worker	18	22%
Supervisor	02	03%
Total	80	100%

Business Ownership		
Self Founded	52	65%
Purchased	25	31%
Family Business	03	04%
Total	80	100%

The table above shows that 75% of respondents are using their personal savings to start their business, while some respondents have borrowed from their relatives and friends to start their business. Table 4 shows the correlation coefficients and other statistics for the variables surveyed in this research work and also shows the inter-correlations among the variables.

Table 4: Statistics and inter-correlations among the variables

	Pull Motivation	Push Motivation	Intention	Mean	Standard Deviation
Pull Motivation	1	0.230*	0.484**	34.52	13.68
Push Motivation		1	0.278*	30.60	2.59
Intention			1	22.52	5.36

*Significant correlation at the 0.05 level (2 tailed)

**Significant correlation at the 0.01 level (2 tailed)

Table 4 delineates that while both pull ($r=0.484$) and push ($r=0.278$) motivations are connected with intention, pull elements of inspiration set a more grounded relationship at entry point than push components of inspiration. Regression analysis was used to assess the association between the two free factors (Table 5) and venturesome desire.

Table 5: Coefficient of determination between dependent and independent variables

Variable	Beta Standard Coefficient	T Value	Significance
Intention		9.665	0.000
Pull Motivation	0.615	5.498	0.000
Push Motivation	0.065	0.579	0.565
Model Summary Adjusted R-Square 33.5% F=15.839 Significance 0.000			

The above table portrays that Pull motivation ($p < 0.05$) influenced expectation the positive way, and has more impact on women turning out to be entrepreneurs, as confirmed by Beta score, T, and Push factors of inspiration which are not factually huge ($p > 0.05$). Balanced R Square for this model is 0.335, which shows that 33.5% of the adjustments are clarified by the free factors.

The fundamental structure of this research study lies in the way that both Pull and Push factors of motivation are developed around the women entrepreneurship contemplates. The study obviously emerges to bolster hypothesis 1. Many research studies conducted in the past have also reported that lion’s share of women business visionaries in Uttar Pradesh is attracted to entrepreneurship by Pull factors (Mahajan, 2013; Swarnalatha and Anuradha, 2013; Gandhi and Sharma, 2014). This is likewise in congruity with numerous investigations. The analysts like Hisrichand O’Brien, Benzing and Hung have emphasized that Pull factors are more pervasive than Push factors of inspiration. It can, thus, be concluded that there is a less connection between Push factors of inspiration and being enterprising.

Conclusion

Motivation is one of the main variables to start any kind of business and get successful in it. One must be highly motivated to establish and lead a business, and must have interest in it. Other variables like education and experience are also very essential for entrepreneurial development. The study has shown that educated people are more inclined to become entrepreneurs.

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Sustainability Management and Emerging Marketing Strategies for Herbal Care Products in COVID 19

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Abstract

Environmental protection and sustainability have become prime necessity in COVID-19 pandemic prevailing all over the globe. Brand Management has assumed vital dimensions in the minds and perceptions of consumers/users in the recent years in Indian economy. As consumers are exposed to many different brands in the consumption of the herbal care products, attributes such as familiarity, brand awareness, loyalty, price, affordability and quality /hygiene related factors become dominant for selection and repeat purchases. This study demonstrates why emotional branding is essential especially to herbal care brands, while developing brand strategies in a volatile marketplace. Trends that support a need for these strategies include consumers' desires for positive experiences, expressing authentic self, achieving global care/well-being along with helping other intents and co-creating design or ideas with the brand with sustainability / environmental protection objectives in a cultural diaspora context of India. Although brand technicalities such as product attributes, features, and facts may be unmemorable, personal feelings and experiences better shape consumers' evaluations of brands. This research study attempts building brand images for herbal care products distinctive from competitors' brands/offerings and meeting customer needs/expectations in sustainability marketing context.

Keywords: Branding, Emotional Capital, Competitive Advantage, Waste Management.

Introduction

It is a strange contradiction that the fields of Marketing Management and Sustainability are often found to affect each other. To illustrate, Sustainability when expanded and the scope encompassed to address the entire ecosystem survival and its future. As such, Sustainability driven Development has been defined as “Sustainability

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Development meets the needs of the present without compromising the ability of future generations to meet their own needs." (Brundtland Report, 1987). The term sustainability is always challenged by problems such as global warming, all types of pollution, lack as well as ignorance about the waste management and depletion of natural resources across the various areas demands a categorical change in the practice to enable future generations to sustain themselves (Nash, 2009). To address the growing challenges of the ever-increasing consumption and production within the modern society that contributes its challenges specific to the sustainability and pose a general threat to the goal of the environmental protection. The events that followed the unexpected exposure of the COVID 19 pandemic has renewed the thrust on the practices of sustainability laid development and related practices in the area of marketing management.

In the business arena the marketing function is held responsible to articulate the business strategy, by evolving it through several changes in terms of the objectives' focus. In order to design a winning competitive advantage for the enterprises with a view to understand the path commencing from traditional marketing management and its journey towards the final form of addressing the sustainability marketing stage, the key flow of the concepts can be depicted as in Figure 1.



Figure No.1

The phenomena of the marketing mix and competitive advantage have been added in the pioneering sustainability laid marketing approaches aimed to provide businesses the opportunity to increase their competitiveness (Kotler et al., 2008). Further, to help companies to enhance the market performance in terms of its sales and its product presence in various geographies had been covered in the scope of modern tools of Marketing Mix (Culliton, 1948; Borden, 1964; McCarthy, 1964). Marketing mix comprised four different dimensions (Kotler et al., 1999), to obtain what people need and want through creating and exchanging products and value with others.

The consumption of the health and wellness products having herbal ingredients is rapidly increasing across all segments in the Indian pharmaceuticals market. This spurt in the demand supports the objective of sustainability management since, it does not involve hazardous chemicals, waste matters, which cause threats to the environment. Herbal based wellness and care products mean those products prepared and processed with the help of the herbs. Herbs are food rather than medicine because they are intended to be used as complete, all-natural and pure, as nature has beholden. Herbal products are medicines derived from specific plants. They are used mainly as supplements to improve health and well-being and can be used for other therapeutic purposes.

Herbal products are available in the form of tablets, capsules, powders, extracts, teas and so on. Turmeric, Neem/Margo, Black Cohosh, Echinacea, Garlic, Ginkgo, Saw Palmetto, etc., are included in the range of examples of common herbal based health care products. It is estimated that nearly 80% of the population from major Asian and African countries presently adopted the usage of various types of herbal medicine for prime aspect of primary health care (World Health Organization, 2019). From the ancient heritage times in India, Ayurveda therapy includes substantial number of ingredients that have undergone “alchemical processing”, chosen to balance the tri-dosha viz., the *Vata*, the *Pitta* and the *Kapha*.

The global herbal medicine market has witnessed to acquire in multiple segments it comprises of leaves, roots and barks, fruits, whole plants, and others. It has been found that the leaves segment is leading in the global herbal medicine market in the recent periods. The size of the herbal medicine market value is estimated to surpass USD 129 billion revenue mark by 2023 at a rate of 5.88% CAGR. As per the distribution channel, the largest market is catered through the hospitals and retail pharmacies, it accounted for 55.82% of the global market in 2017, followed by ecommerce and others modern channels, by the form wise, the market is segmented into capsules and tablets,

powders, extracts, syrups, and others, among them, the extracts accounted for the largest market share in 2020 and are likely to remain dominant over the upcoming forecasted period.

Since some of the raw materials are herbs and shrubs, which can be harvested and grown in a period of one year. But a sustainable approach is needed in cultivation of huge medicinal trees, which usually takes more than 10 years to get ready for harvesting. It is only possible by adoption of a holistic approach which deals with the conservation, cultivation, research, and development of medicinal plants. The sustainability of the herbal industry is only possible by focusing on the supply side of the business model it need to become sustainable through a wide program of livelihood management of the stake holders involved in the entire supply chain and practicing and promoting both the sustainable cultivation and long term views on harvesting, motivating new methods such as integrated cultivation, and encouraging conservation of trees.

The total annual turnover of the Ayurveda drug manufacturing industry is estimated to be around Rs.3,500 Crores. There are total of 9, 493 manufacturing units, of which mostly are small scale units (8,000) having an individual annual turnover of less than one crore. Some of the well-known industrial houses with individual annual turnover ranging from Rs.3,500 Crores to more than 50 Crores are the famous Baba Ramdev's Patanjali, Dabur India Ltd, Zandu Pharmaceutical Work Ltd., Himalaya Drug Company, and Shree Baidyanath Ayurveda Bhawan Pvt. Ltd., Arya Vaidya Shala, etc.

Method

The usage of herbal care products and its sustainability model with respect to its buyers located in Mumbai City specifically has been studied to test the identified research objective in the focus of the current COVID scenario. Exploratory research model has been designed to understand the consumer perception about the preference for the herbal ingredient product. A deliberate random sampling method has been chosen to ensure the selection of the proper sample across the Mumbai city. The area defined for sampling was Municipal Corporation of Greater Mumbai (MCGM). A questionnaire was designed to justify the required data to address the research objectives.

Sampling: The study is based on a consumer survey method. But both Primary as well as secondary data have been used to elaborately arrive at some logical conclusion in this study. Primary data has been collected from a sample survey of various customers

in MCGM (Municipal Corporation of Greater Mumbai). Secondary data have been collected from related journals, magazines and textbooks. A demographic profile of a sample survey of herbal ingredient-based product users in a suburban area of MCGM is given below:

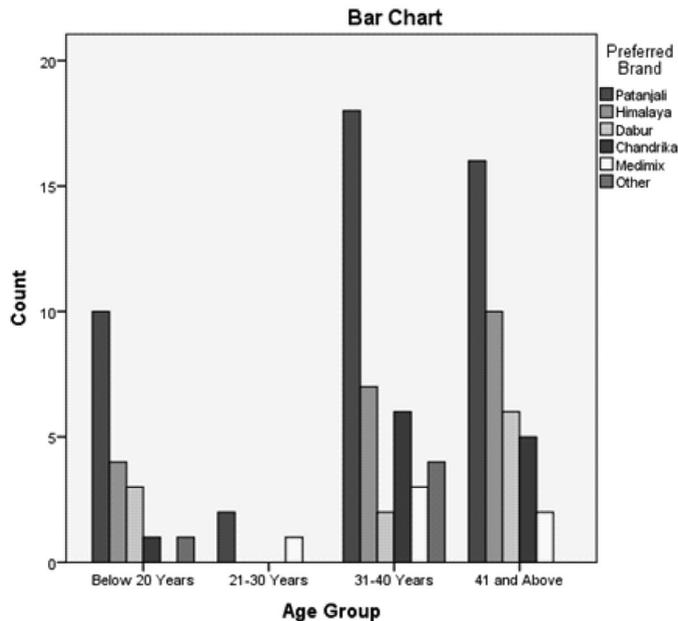
Table 1: Sample details according to the preferred brands

		Preferred Brands							
Characteristic	Level	Patanjali	Himalaya	Dabur	Chandrika	Medimix	Other	Total	%
Gender	Male	18	12	5	7	3	4	49	48.51
	Female	28	9	6	5	3	1	52	51.49
	Total	46	21	11	12	6	5	101	100.00
Education	Below Degree	2	0	1	1	0	1	5	4.95
	Degree	29	17	6	9	1	4	66	65.35
	Above Degree	15	4	4	2	5	0	30	29.70
	Total	46	21	11	12	6	5	101	100.00
Age	Below 20 Years	10	4	3	1	0	1	19	18.81
	21-30 Years	2	0	0	0	1	0	3	2.97
	31-40 Years	18	7	2	6	3	4	40	39.60
	41 and Above	16	10	6	5	2	0	39	38.61
	Total	46	21	11	12	6	5	101	100.00
Income	Below Rs.10, 000	10	3	4	3	2	1	23	22.77
	Rs.11, 000 to Rs.30, 000	20	11	2	5	3	4	45	44.55
	Rs.31, 000 to Rs.50, 000	10	2	3	1	0	0	16	15.84
	Rs.51, 000 and Above	6	5	2	3	1	0	17	16.83
	Total	46	21	11	12	6	5	101	100.00

Results and Discussion

Table 1 describes the demographic profile of the subjects studied in this research to examine their approach towards the herbal ingredient products. Out of 101 customers who were taken for the study, it has been identified that most (52%) of the customers are female, whose age group is above 31 years and more (78%), out of the customers maximum (95%) are graduates, the monthly income of (78%) customers is above Rs.10,000. A significant group of buyers (37%) of buyers purchase the herbal products from dispensaries/pharmacists. Out of the same group, 40% are in the age group of 31-40 years and 39% belong to 31-40 years. Graduates constitute 66% of the buyers and 30% belong to Graduate plus across all age groups starting from below 20 years to 41 years and above.

While analysing the consumption patterns of the herbal ingredient products brand wise, it has been revealed that the brand Patanjali is the prominent among all similar herbal brands followed by Himalaya and Chandrika which occupy next ranks of preferences.



Marketing methods used by Patanjali as a herbal care brand appeals to the consumer because of its name associated with the ancient and famous saint who founded the system of herbal care medicine and overall protection of human beings as different from Allopathy which suppressed the symptoms of illnesses /diseases and side effects /allergies to different people had not been detected.

Brand Himalaya is ranked the second preferred in this study, because it is associated with the famous Himalaya Parvath, i.e., mountain, which is a natural storage of unique herbs which are beneficial to human beings. These herbs are grown and processed through controlled production methods which are nature friendly and not harmful to the natural sources of earth and its species. Chandrika as a brand which appeals largely to the female consumers because of the signification of feminine beauty and supportive nature of females to other human beings related to the family as its consumer. Medimix signifies importance to the consumer since several herbs are mixed to give medicinal and healing value to the users. Both Chandrika and Medimix are mainly consumed by user families belonging to Kerala, Tamil Nadu and other southern states because it is produced by a leading toiletries and cosmetics manufacturer located in Kerala.

Dabur is a preferred herbal brand for its vast range of products mainly by the consumers from the Eastern and the Northern belts of India, because the producer's name has a lineage and is well-known in the medical practitioners of pre independence years. Each of these products have their own and strong emotional appeal and it has created a strong bonding with the family members as the consumers. It has been handed over by the tradition and elder members, whether dead or alive. All these product brands have been chosen because these have innate appeal to human care and protection and related to sustainability in their marketing, which is the main theme of our research.

Chi square test of independence was performed to examine the relation between the various factors contributing to the sustainability of the herbal ingredient-based products with relation to the demographic categories of the buyers to understand the influencing factors in its sustainability. It was tested for preferred brands, method of buying, place of buying and preference for type of medicines such as Ayurveda, chemicals or cosmetics. The demographic characteristics such as education, income, gender and age of the buyers and the major prevailing brands in the Indian market. The summary of the test results, indicating its relationship between these variables has described in the Table No.2 as below. For a sample size of N=101. All tests were conducted against set 00.05% level of significance.

Table 2: Results of the Test of Association

Tested For	With Variable	Df	X2 value	P	Pearson's R	Result
preferred brand	Important herbal ingredient	25	24.802	0.473	-0.018	Insignificant
	Gender	5	4.742	0.448	-0.169	Insignificant
	Level of Education	10	16.923	0.076	-0.045	Insignificant
	Age Groups	15	15.379	0.424	0.046	Insignificant
	Monthly Income	15	12.350	0.652	-0.080	Insignificant
Method of Buying	Important herbal ingredient	05	6.237	0.284	-0.058	Insignificant
	Gender	1	0.580	0.809	0.240	Insignificant
	Level of Education	2	3.837	0.147	0.023	Insignificant
	<i>Age Groups</i>	3	<i>8.451</i>	<i>0.038</i>	<i>0.052</i>	<i>Significant</i>
	<i>Monthly Income</i>	3	<i>11.491</i>	<i>0.009</i>	<i>-0.044</i>	<i>Significant</i>
Place of buying	<i>Important herbal ingredient</i>	<i>20</i>	<i>40.238</i>	<i>0.005</i>	<i>0.056</i>	<i>Significant</i>
	Gender	4	3.907	0.419	0.720	Insignificant
	<i>Level of Education</i>	8	<i>22.400</i>	<i>0.004</i>	<i>-0.0001</i>	<i>Significant</i>
	<i>Age Groups</i>	<i>12</i>	<i>24.233</i>	<i>0.019</i>	<i>-0.092</i>	<i>Significant</i>
	<i>Monthly Income</i>	<i>12</i>	<i>60.425</i>	<i>0.000</i>	<i>0.217</i>	<i>Significant</i>
Preferred	Gender	2	0.227	0.893	-0.038	Insignificant
Medicine	Education	4	7.318	0.120	0.077	Insignificant
Ayurveda,	Age Groups	6	3.305	0.770	0.707	Insignificant
Chemical Cosmetic:	Monthly Income level	6	8.088	0.232	0.097	Insignificant

Table 2 depicts the relationship between selected demographic variables and, the calculated Chi-square value is greater than table value at five per cent level there does exists any significant association between gender, age, educational qualification level of satisfaction towards herbal product. Thus, the null hypothesis is rejected. The calculated Chi-square value is less than the table value at five per cent level, there exists no significant association between monthly income and level of satisfaction towards herbal product. Thus, the null hypothesis is accepted.

This case study attempts to understand the consumption pattern of herbal care products by a random diverse sample drawn from suburban area in Mumbai Metropolitan Region during the COVID period. This study is exploratory, because the impacts of COVID 19 are not fully realized across the population in the Suburban of MMR and the environment in which they live.

Conclusion: Emerging Marketing Strategies

- Herbal care products are used by all people from ancient times to contemporary period in view of its innate ingredients which build their good health with the help of natural sources without harming the environment. It should reach each man for their health and safety.
- There is a need for educating the consumers and awareness about herbal products. Herbal care products manufactured by safe and harmless process to human and their environs which essentially contribute to the long-term sustainability.
- With COVID 19 looming all over the globe and particularly in India, the impact on human life and protection becomes vital with a thrust on Sustainability Marketing.

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Traditional Time Series versus Machine Learning Forecasting Models: A Special Case of Nifty Bankex

Deepa Venugopal*, S T Nambi**, Shanmuga Priya S***

Abstract

The purpose of this paper is to predict the price of Nifty Bankex using Traditional time series forecasting models essentially Moving Averages versus Machine Learning Algorithm to explore the best tool to predict bankex for the period 2018-2020. It uses Exponential Moving Average (EMA), Weighted Moving Average (WMA), Simple Moving Average (MA), Triangular Moving Average (TMA) and Variable Moving Average (VMA) under conventional time series tools. Under Machine Learning (ML), Five Regression algorithms are used which include Linear Regression-Nearest Neighbours, Decision Tree, Support Vector Machines, and M5P-Binary Regression Tree Model. WEKA software is used to run Machine Learning algorithms. In ML the data set is divided into training set and test set. In this study, 70% of the datasets are trained and 30% are tested. This study is an effort to find the price prediction accuracy of conventional time series tools versus Machine Learning tools for Nifty Bankex. The study proves that machine learning tools are more accurate in prediction as the error is found to be less. The study focuses on price predictions for one of the strongest pillars of Indian economy. Not many price prediction accuracy studies have been done for this sector in the Indian context.

Keywords: Moving average tools, Exponential moving average, WEKA, Linear regression, SVM.

Introduction

Accurate forecasting of the stock prices has always been a task for the traders and investors as the stock markets are highly volatile. Predicting the stock prices unlocks the direction of the future price movement which helps investors to make appropriate buying decisions, improves profitability and decreases possible losses. Traders and researchers use fundamental analysis, traditional time series analysis to predict the

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stock prices. With the rise of intelligent computing, researchers and stock market professionals have started using Machine Learning and Deep Learning to predict stock prices.

Traditional time series uses historical stock price to predict future price. Machine learning uses historical data, as training data, to create machine learning algorithms which are used to build mathematical models. These models help in the prediction of the future price movements. This study aims at predicting price movements of Nifty Banking stocks – popularly known as Nifty Bankex using traditional time series (Moving Average tools) and Machine learning (regression) algorithm. An added objective is to ascertain the best prediction tool for bankex price prediction. The study is organised as follows. Part 2 reviews the existing studies, part 3 talks about the research methods. Part 4 focuses on data analysis and interpretation followed by research findings and conclusion.

Forecasting has always been researchers' sought after analysis technique. Starting from time series to machine learning to deep learning, there are plethora's of tools available in forecasting. In the present work the focus is on comparison of predictive ability of Time series (Moving Averages) vs. ML tools. Forecasting models can be divided into basic time series models, advanced time series models and Machine learning methods (Behmiri & Manso, 2013). Time series models such as SES and MA are the most commonly used forecasting methods for time series data, including crude oil prices, U.S. government statistics, and Wall Street stock prices. MA, SES, and ARIMA models are often used as benchmarks to measure forecasting accuracy on crude oil prices and stock prices against more complex machine learning models. Zahid et al. (2013) concluded that that Neural Network is the best technique to predict stock prices especially when some de noising is applied with neural network.

Wen et al. (2014) decomposed the stock price trend, market fluctuation, and noise with different economic features over different time horizons, and used support vector machine (SVM) to make price predictions. Kumar & Sharma (2016) used ANN based approach to forecast Nifty 50 Index. Study conducted by Anthony (2016) concluded that using machine learning as a trading strategy can positively impact the returns generated compared to using many technical indicators. He also suggested that in a bear market it is more beneficial to use technical analysis. Agarwal & Alam (2019) used time series method approach to build a financial model to predict stock prices. Literature shows mixed results of predictive ability using Traditional time series and

Machine Learning. In this research we compare the Traditional time series tools with Machine learning models to study the predictive ability.

Method

The study uses Predictive research design on account of using current and historical data to forecast the probability of future events, outcomes or consequences. Predictive research requires numerous statistical techniques, such as data mining (identification of patterns in data) and machine learning. These trends and patterns are then used to predict future outcomes and trends.

Sample and data collection: Secondary data has been used for this study. The share prices were downloaded from National stock exchange website. Historical data of nifty bank stocks was taken for the period 3 years. (1/1/2018 -11/9/2020). Since the market is closed on weekends and public holidays, the data collected is for 667 days.

The study uses both Time series forecasting models and predictions using ML. Forecasting models are generally tried and tested frameworks which helps in predicting the outcomes more easily. A model that forecasts prices with the highest accuracy rate will be chosen as the best prediction. The tools used include Exponential Moving Average (EMA), Weighted Moving Average (WMA), Simple Moving Average (MA), Triangular Moving Average (TMA) and Variable Moving Average (VMA) under time series forecasting. Five Regression algorithms used under ML include Linear Regression-Nearest Neighbours, Decision Tree, Support Vector Machines, and M5P-Binary Regression Tree Model.

Data Analysis and Interpretation

This paper uses two different analyses. One is using time series forecasting methods and other using Machine Learning Model. These two has been employed to find the direction of price movements in nifty bank stocks and check which would be more dependable in prediction. In time series method moving average methods have been used and in machine learning, a regression algorithm through WEKA software has been used. To evaluate the effectiveness of both analyses, the Root Mean Square Error (RMSE) and Mean Absolute Error (MAE) metrics are used. For metrics, the lower the value, the better the prediction.

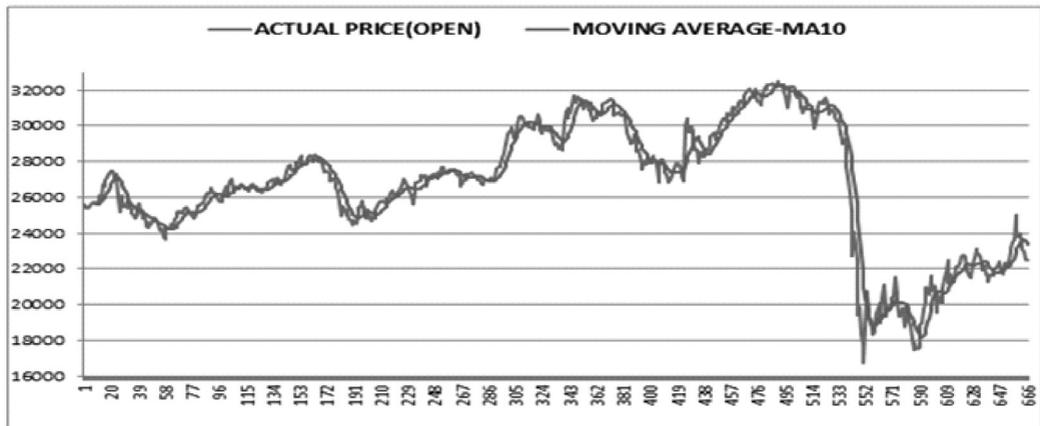
1. Time Series Analysis

This study uses time series analysis tools like Simple moving average, Triangular Moving Average, Exponential Moving Average and Variable moving averages. In the moving average method, the predicted value will be the mean of the previous N values. All these moving averages use 10-days price moving average and for Weighted Moving Average, 3-days moving average is taken.

Time Series Prediction

Below given are the analysis and interpretation for all the moving averages studied.

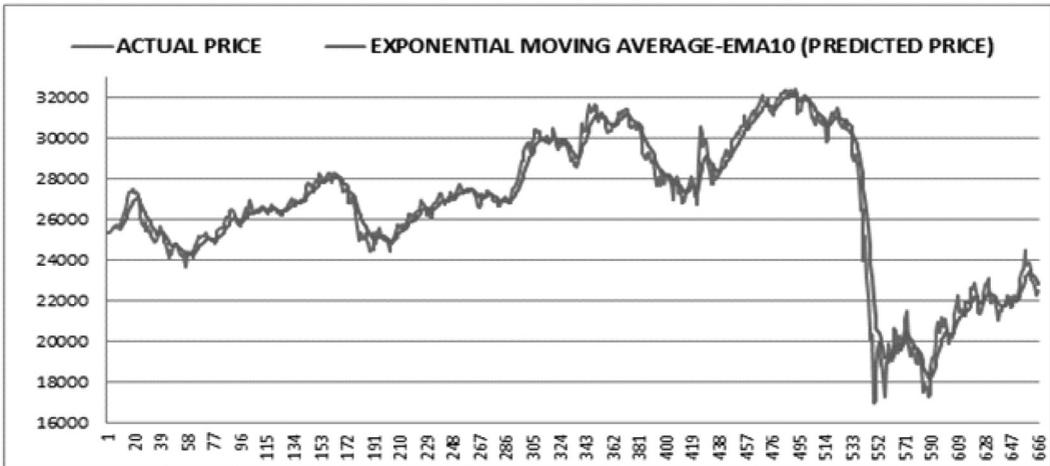
Simple Moving Average - Close Price. It is calculated by summing up the closing prices of the last 10 days of bank nifty stocks and dividing by the number of days.



Graph 1: Comparison of Actual Vs. Predicted Prices - Simple Moving Average

The graph shows that the predicted and observed prices are not in same range. It's different from actual price. The Mean Absolute Error between the actual price and the predicted price is 747.96. The Root Mean Squared Error between the actual price and the predicted price is 1146.9. The big difference between the MAE and RMSE indicates that there is huge error, Indicating less accuracy and depicts shaky trend prediction.

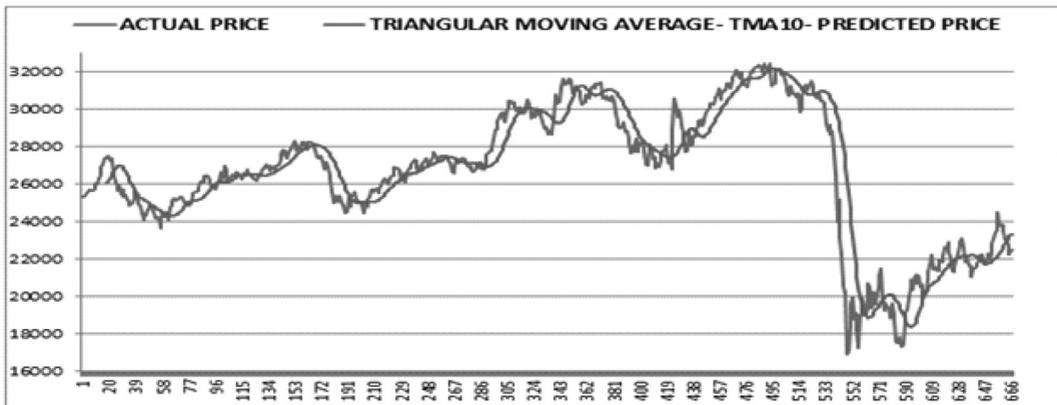
Exponential Moving Average - Close Price. The current EMA is used to calculate by the formula: **Current EMA = [Closing Price – EMA (Previous Time Period)] x Multiplier + EMA (Previous Time Period)**. A multiplier of 18.18% is applied to the recent price for 10 days.



Graph 2: Comparison of Actual Vs. Predicted Price - Exponential Moving Average

Exponential moving average also depicts considerable error in actual vs. predicted price and hence has feeble predictive power. Graph 2 shows that the predicted price is not in the same range as the observed price. The Mean Absolute Error between the actual price and the predicted price is 638.82. The Root Mean Squared Error between the actual price and the predicted price is 1000.91.

Triangular Moving Average - Close Price. It is calculated by taking the average of the Simple Moving Average. This creates an extra smooth moving average line.

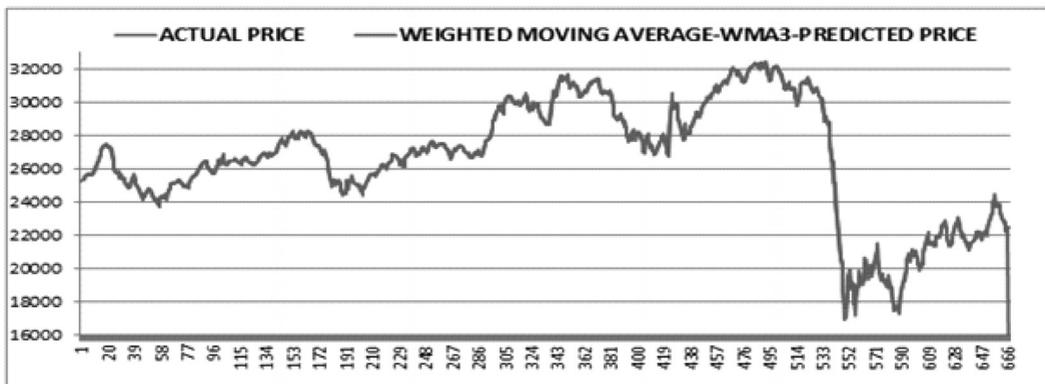


Graph 3: Comparison of Actual Vs. Predicted Price – Triangular Moving Average

TMA is also low on the trend prediction ability as the predicted price does not lie close to the actual price. The Mean Absolute Error between the actual price and the predicted price is 1170.4. The Root Mean Squared Error between the actual price and the predicted price is 1913.68.

Weighted Moving Average - Close Price. In WMA, the most recent data is more heavily weighted, and contributes more to the final WMA value. For 3 days average, WMA is calculated as:

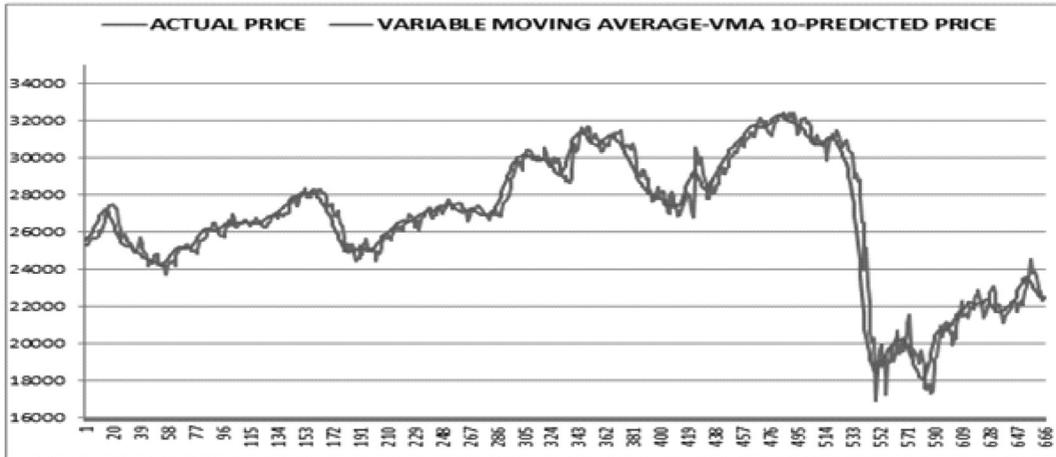
$$\text{WMA} = \frac{3^{\text{rd}} \text{ day closing price} * 5 + 2^{\text{nd}} \text{ day closing price} * 3 + 1^{\text{st}} \text{ day closing price} * 2}{5+3+2}.$$



Graph 4: Comparison of Actual Vs. Predicted Price – Weighted Moving Average

The graph shows WMA has more accuracy in predicting trends as we observe that the predicted price is in the same range as of the actual price. The Mean Absolute Error between the actual price and the predicted price is **280.18**. The Root Mean Squared Error between the actual price and the predicted price is **858.85**.

Variable Moving Average - Close Price. A Variable Moving Average is an exponential moving average that automatically adjusts the smoothing weight based on the volatility of the data series.



Graph 5: Comparison of Actual Vs. Predicted Price – Variable Moving Average

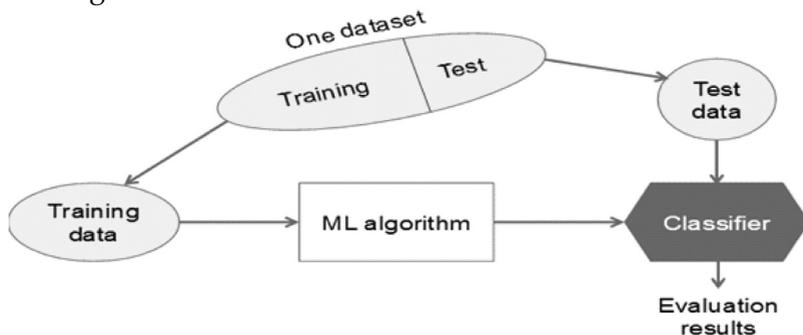
The Variable moving average shows less accuracy as it does not predict the trend better because of substantial error. The above graph shows that the predicted price is not in the same range as the observed price. The Mean Absolute Error between the actual price and the predicted price is 754.45. The Root Mean Squared Error between the actual price and the predicted price is 1143.97.

2. Machine Learning

Machine Learning is a branch of artificial intelligence, based on the idea that systems can learn from data, identify patterns and make decisions with minimal human intervention. Machine learning is the process of teaching a computer system how to make accurate predictions when we feed data.

Classification Tool - WEKA:

The classification tool used in this study is WEKA, which makes a large number of classification algorithms available.



Prediction through WEKA Software

Classification:

Table 1: Parameters and events for classification

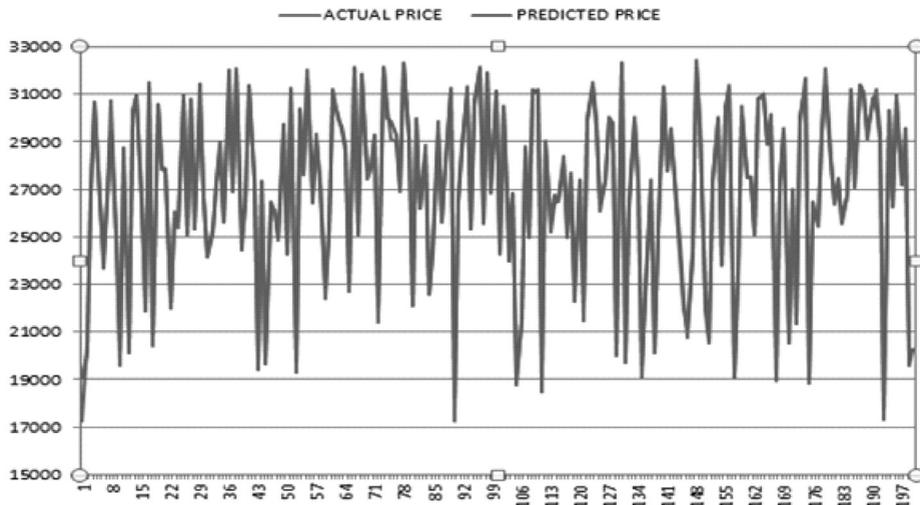
PARAMETERS	EVENTS
Inputs	Actual price - Close price
Output	Predicted Price
Percentage split for training data set and test set	
Training set	70%
Test set	30%
Total instances	667
Training set	467
Test set	200

The data set is divided into training set and test set. In this study, 70% of the datasets are trained and 30 % are tested. The output looks at the prediction price, correlation coefficient, Root Mean Squared Error, Relative Absolute Error, Root Relative Squared Error. Higher the error, lesser will be the prediction accuracy and vice-versa. Comparison between Time series moving averages and Machine learning tool can be compared to find which method gives best prediction results.

Regression Algorithms

(i) Linear Regression

Linear regression algorithm in WEKA- "Linear Regression" under the "functions" group.

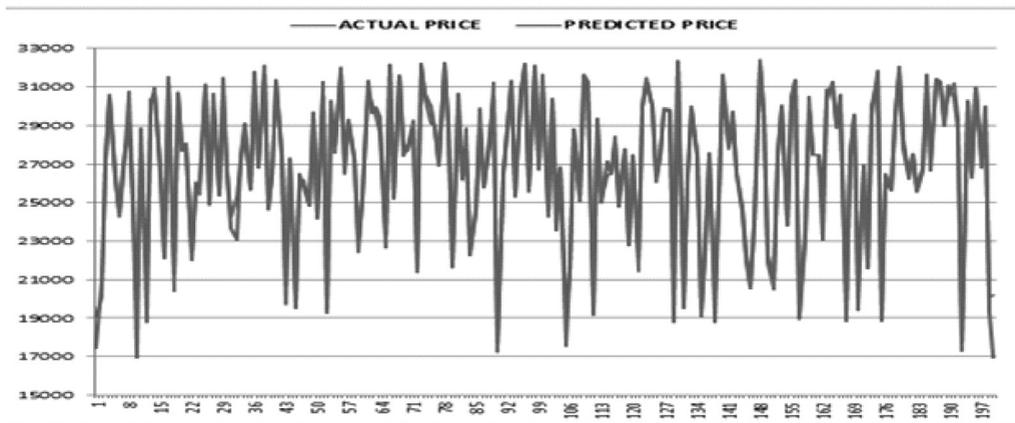


Graph 6: Comparison of Actual Vs. Predicted Price (Linear Regression)

The above graph shows that accuracy is more as predicted and actual price lie close to each other. The Mean Absolute Error between the actual price and the predicted price is 287.75. The Root Mean Squared Error between the actual price and the predicted price is 387.78.

(ii) K-Nearest Neighbors

KNN algorithm in WEKA - "IBk" under the "lazy" group.



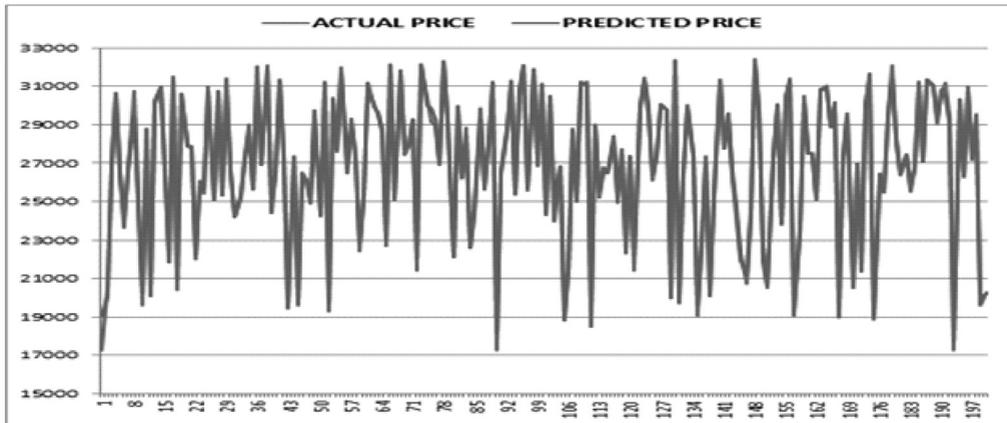
Graph 7: Comparison of Actual Vs. Predicted Price (K-Nearest Neighbors)

The above graph shows that the error is more between actuals and predicted. The Mean Absolute Error between the actual price and the predicted price is 440.54. The

Root Mean Squared Error between the actual price and the predicted price is 645.26. This indicates that the error is more compared to the previous methods thus less accurate.

(iii) Decision Tree

Decision Tree Algorithm in WEKA - "REPTree" under the "trees" group.



Graph 8: Comparison of Actual Vs. Predicted Price (Decision Tree)

In the Decision tree analysis, the Mean Absolute Error between the actual price and the predicted price is 333.25. The Root Mean Squared Error between the actual price and the predicted price is 479. It indicates less accuracy as error is on a higher side.

(iv) Support Vector Regression

SVR algorithm in WEKA - "SM Oreg" under the "function" group.

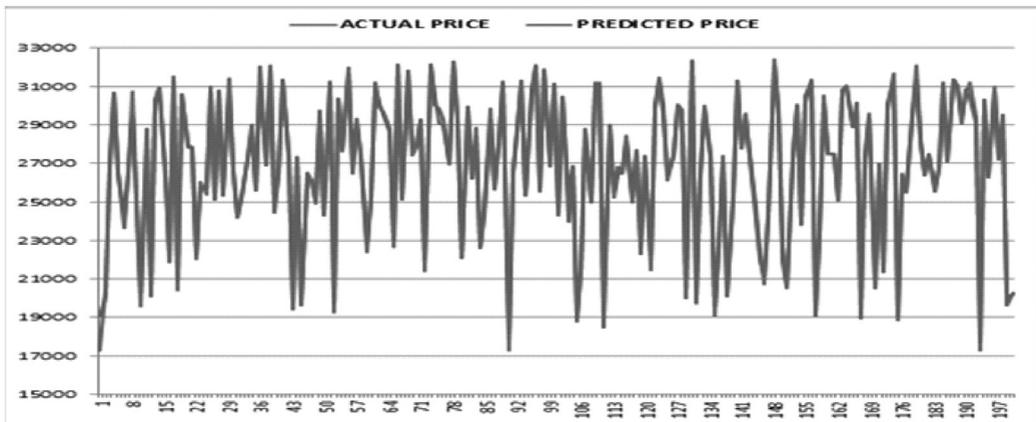


Graph 9: Comparison of Actual Vs. Predicted Price (Su

Support Vector Regression shows the predicted price range is same as that of the actual one The Mean Absolute Error between the actual price and the predicted price is **283.43**. The Root Mean Squared Error between the actual price and the predicted price is **384.53**. Here, the error is less, hence predicts the trend better.

(v) Binary Regression Tree Model

Binary Regression Tree Model in WEKA- "M5P" under the "Tree" group.



Graph 10: Comparison of Actual Vs. Predicted Price (Binary Regression Tree)

Akin to SVM, Binary Regression Tree model predicts trend with good accuracy as error is less. The Mean Absolute Error between the actual price and the predicted price is **287.75**. The Root Mean Squared Error between the actual price and the predicted price is **387.78**.

Consolidated Results

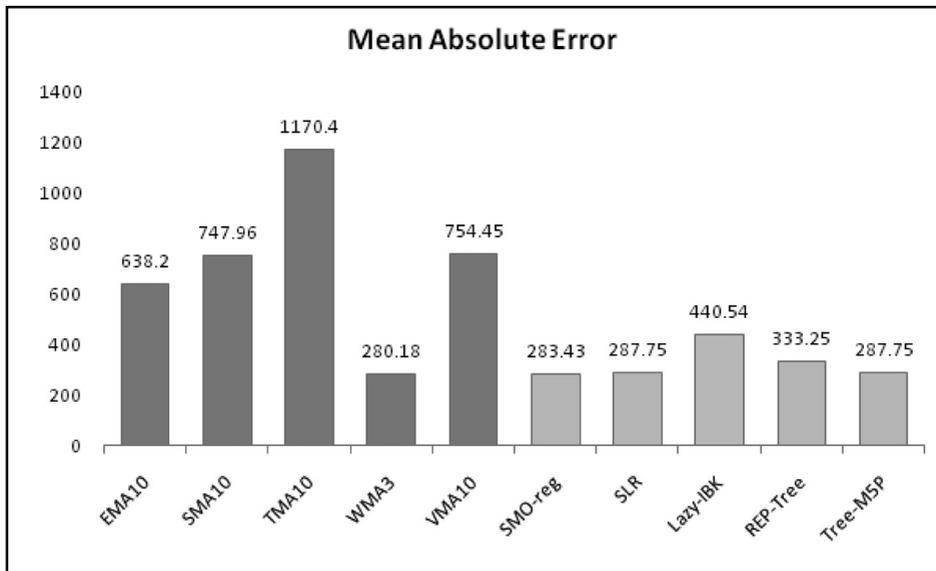
Table 2: Errors in Actual vs. Predicted Price under Time series and Machine Learning

Particulars	Mean Absolute Error	Root Mean Squared Error
Exponential Moving Average - EMA 10	638.82	1000.91
Simple Moving Average - SMA 10	747.96	1146.9
Triangular Moving Average - TMA 10	1170.4	1913.68
Weighted Moving Average - WMA 3	280.18	858.85
Variable Moving Average - VMA 10	754.45	1143.97
Functions - Smo - reg	283.43	384.53
Functions - Simple Linear Regression	287.75	387.78
Lazy-IBk	440.54	645.26
Decision Tree-REP Tree	333.25	479
Trees-M5p	287.75	387.78

The above table shows that Machine learning tools give better accuracy in predictions than Moving Averages method in Time series analysis.

Discussion

Accuracy of predictive models is determined by the magnitude of the error in the predicted results. In this study, two of the most widely used measures of Mean Absolute Error (MAE) and Root Mean Squared Error (RMSE) are employed to compare the prediction accuracy of time series models and machine learning models.



Graph 11: Mean Absolute Error – Time series Model Vs Machine Learning Model

The above graph displays the MAE computed by comparing the output of the various predictive models employed in this study and the actual values of Nifty Bankex. The Mean Absolute Error is calculated as follows:

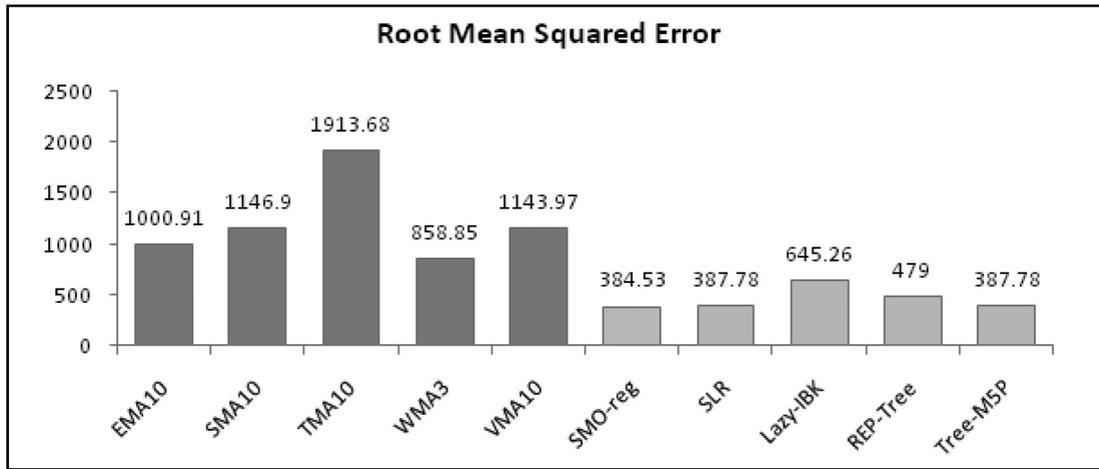
$$MAE = \frac{\sum_{i=1}^n (Y_i - x_i)}{n}$$

Where y_i is the predicted value

X_i is the actual value and

n is the number of data points

MAE obtained from the time series models are shaded thick while outputs of machine learning models are shaded light. It is obvious that MAE obtained from ML are significantly lesser than that of traditional time series model. The least accurate model is Triangular moving average with an MAE of 1170 and the most accurate model is weighted moving average model with an MAE of 280. Except for WMA3, all the time series models suffer from high error values. ML models display significantly lesser MAE with SMO being the most efficient (283) and the least accurate being Lazy-IBK (440). The average error of the traditional models is 718 while the average MAE of ML models are found to be 327. It is to be noted that the prediction errors are reduced by more than 54% in magnitude with ML models.



Graph 12: Root Mean Squared Error – Time series Model Vs Machine Learning Model

Graph 12 displays the RMSE computed by comparing the output of the various predictive models employed in this study and the actual values of Nifty Bankex. Root Mean Squared error is calculated as follows:

$$RMSE = \sqrt{\frac{\sum_{i=1}^n (Y_i - x_i)^2}{n}}$$

Where y_i is the predicted value
 X_i is the actual value and
 n is the number of data points

RMSE obtained from the time series models are shaded thick while outputs of machine learning models are shaded light. It is obvious that MAE obtained from ML are significantly lesser than that of traditional time series model. The least accurate model is Triangular moving average with an RMSE of 1914 and the most accurate model being SMO regression with a RMSE of 385. ML models display significantly lesser error with SMO being the most efficient (385) and the least accurate being Lazy-IBK (645). The average error of the traditional models is found to be 1213 while the average RMSE of ML models are found to be 457. It is to be noted that the prediction errors are reduced by 62% in magnitude with ML models.

Percentage of Prediction error is also calculated for all the models using the following formulae and tabulated below.

$$MAE(\%) = \frac{MAE}{(\sum_{i=1}^n(x_i))/n} \times 100$$

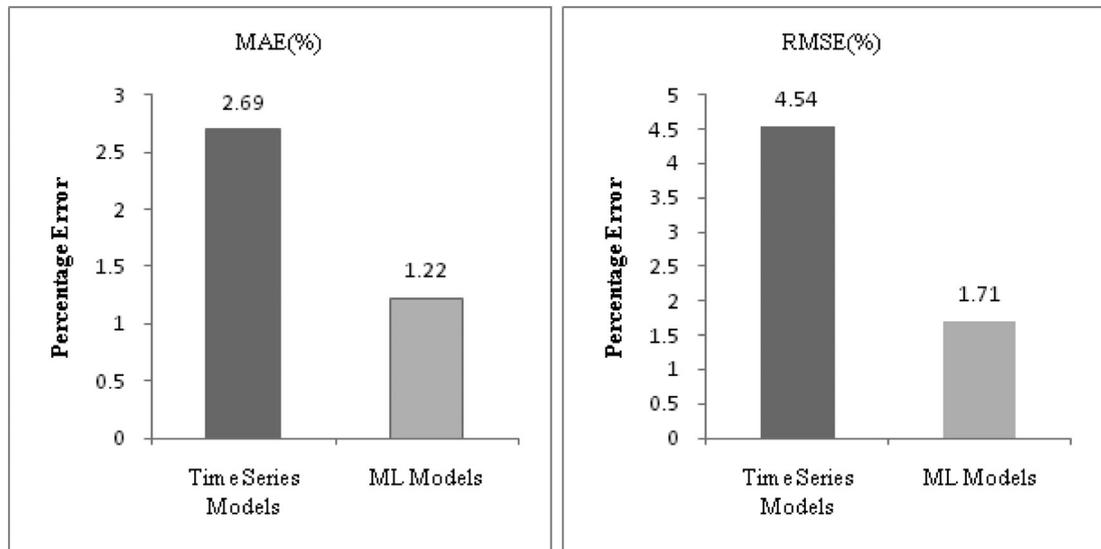
$$RMSE(\%) = \frac{RMSE}{(\sum_{i=1}^n(x_i))/n} \times 100$$

Where x_i is the actual values of Bankex and n is the number of data points.

Table 3: Percentage Error for Various models under Timeseries and ML

Percentage Error	EMA10	SMA10	TMA10	WMA3	VMA10	SMO-reg	SLR	Lazy-IBK	REP-Tree	Tree-M5P	Average of Time Series Models	Average of ML Models
MAE (%)	2.39	2.80	4.38	1.05	2.83	1.06	1.08	1.65	1.25	1.08	2.69	1.22
RMSE (%)	3.75	4.30	7.17	3.22	4.29	1.44	1.45	2.42	1.80	1.45	4.54	1.71

Also, the average percentage error for both traditional and ML models are shown in the last two columns of the above table.



Graph 13: Average Error Prediction under Time series and ML Models

The average error of prediction for traditional models is found to be 2.69% while the ML models exhibit much less error of 1.22% with MAE. In the case of RMSE also, ML Models exhibit much lesser error of 1.71% compared to the traditional models which averages to 4.54%. Thus, it is observed ML models are much superior to the traditional models.

Conclusion

Comparing the Moving Average methods and Machine Learning tools, the machine learning tools gives better predictions as the error in prediction is less. In Machine Learning, Support Vector Regression, Sequential Minimal Optimization-Regression gives lesser error and shows better predictions. In addition to the Support Vector Regression, the Simple Linear Regression and the Binary Regression Tree Model shows lesser error and gives good prediction than the Moving Average methods. In the Time Series Moving Average methods, Weighted Moving Average and in Machine learning tools, Support Vector Regression shows good predictions.

The MAE and the RMSE can be used together to diagnose the variation in the errors in a set of forecasts. The RMSE will always be larger or equal to the MAE, the greater the difference between them, the greater the variance in the individual errors in the sample. Hence lower values are better and accurate. Root Mean Squared Error is lesser in SMO-regression than the Weighted Moving Average. This study provides valuable evidence to the literature and proves that machine learning tools are better in predicting prices as the error is less. In predicting the Nifty Bankex, ML tools are more appropriate than Moving averages.

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Case Study 01

Enhancing Customer Experience*

Background

Post-Independence, the Indian Insurance sector had witnessed many facets of competition, from nationalization to being an open market and then conversion into the liberalized market. As a result of this, the insurance industry had 57 insurance companies which include 24 companies from the life insurance business and 33 are non-life Insurance Businesses. The overall market size of the insurance sector was US\$ 280 Billion in Mar 2020. Jeevan Sanjeevani Ltd., an insurance company had operations in India for over 19 years. It achieved a large base of customers (10 million) spread across India. It had an employee base of over 8, 000 employees. In the year 2019-2020 the company was facing a lot of customer complaints which was involving complaint management costs. The company had to pay this complaint management cost to an external agency that was managing these complaints. The company found out that the claim management, complaint handling were not being done effectively by an external agency, namely, Global Infocom Pvt. Ltd., Pune.

For customer relationship management and saving complaint management cost burden, the company decided to develop its very own complaint management system. To identify the products which were facing major complaints, the company decided to resort to data analytics. The company's data analytics team was given the task to identify the products which were facing major problems in complaint management. The team identified that customers belonging to 7 states in the age category of above 60 and below 25 with ULIP and PAR products had launched most of the complaints. Based on this, the company developed its own WhatsApp ChatBot and AI-based customer complaint management portal and android application. The strategy proved successful and the company was able to significantly reduce the complaint management cost and improve customer satisfaction.

** This case was developed by Biswajit Rath (Head Analytics & CRM, Raymond Ltd, Mumbai), C S Rajkumar Kankariya (Dean, Quality Assurance, G.H. Raison Institute of Business Management, Jalgaon), Martina Rani (Associate Professor, St. Joseph's Degree & PG College, Hyderabad), Niloy Sarkar (Assistant Professor, Bhartiya Vidya Bhavan Institute of Management Science, Kolkata) during the Online Case Writing Workshop organized by the Association of Indian Management Schools (AIMS) from April 21-23, 2021.*

Insurance Industry

The Indian Insurance Industry had 57 insurance companies of which 24 catering to the life insurance business and 33 non-life insurance businesses. Life Insurance Corporation (LIC) was the sole public sector player in life insurance while six public sector insurers providing non-life services. In addition to this, there was sole national re-insurer, namely, General Insurance Corporation of India. The other stakeholders in the insurance market of India included brokers, individual and corporate agents, surveyors, and third-party administrators catering to the health insurance claims.

Market Size

The Indian Insurance Industry had a growth of US\$ 280 Billion by the end of Mar 2020. Globalization, liberalization, and Indian Govt. policies of insuring the uninsured had pushed the insurance penetration in India. The overall insurance in India was 3.71% of GDP in FY 2019 from 2.71% in FY 2002. The life insurance grew at 14.1% YoY growth in individual annualized premium till October 2019, compared with 4.2% YoY September 2019. The market share of the private sector companies in the non-life insurance market rose from 16% in FY2005 to 56.3% in FY2019. In the life insurance segment, private insurance companies had a market share of 30.3% in FY2019.

Jeevan Sanjeevani Insurance Company Ltd

Jeevan Sanjeevani, an insurance company had operations in India for over 19 years. It achieved a large base of customers (10 million) spread across India. The company is operating in all the states and union territories in India. It had an employee base of over 8, 000 employees. The after-tax profit was Rs.182 Crores in FY 2019-20. The company had a dominant stake in the insurance sector. It had a 16% market share in Life Insurance Segment and 18% market share in Non-Life Insurance Segment. It offered life insurance, health insurance, retirement, endowment, saving plans, and claim handling services. It provides a wide variety of products which includes non-participative (Non-PAR), participative, ULIP, and term insurance policies. LIC, ICICI Prudential, SBI Life Insurance, TATA AIG, Bajaj Allianz were its major competitors.

After considering the age band, income band, term band, state of the policyholder, product insured, and sum assured from the company's large database, it was observed that the customers above the age 60 years mostly preferred participative (PAR) & non-participative products, the share being 38% and 29% respectively. While the customers up to the age of 25 years mostly preferred ULIP products, the customers from the age category of 26 to 60 years preferred all four Non-Par, Par, Term, and

ULIP Products. The ratio based on the gender to the policyholder was 68:32 for males and females, respectively. Considering all the product categories non-participative policy products had the highest customer base followed by participative, ULIP, and Term. In relation to the region-wise market share Maharashtra had 21% followed by Gujrat 18%, Uttar Pradesh 16%, Tamil Nadu 15%, Punjab 8%, Karnataka 7%, and the rest by other states. Till 2019-20, the company had launched products across the online and offline mode. The company had outsourced its complaint management system to Global Infocom Pvt. Ltd., Pune.

Issues and Challenges

In the year 2019-2020 the company was facing a lot of customer complaints as compared to the competitors in the insurance industry. These complaints were significantly affecting the customer dissatisfaction and also the burden of complaint management cost, as the company had to pay this complaint management cost to Global Infocom Pvt. Ltd., Pune.

a. Key Issues

- Rising Customer Complaints and Cost involved to manage these complaints.
- Timely redressal of customer grievances to keep the customer satisfied.
- Developing a system to address the need of the existing customer and prospective customers.

b. Challenges

- Identification of Customer Grievances through Data Analytics.
- Development of machine learning led algorithm in the form of Chat Bot.
- Development of Auto Communication Module.
- Saving the complaint management cost.
- Improvement in the customer satisfaction.

New Strategy

For being self-reliant on customer grievance handling and reducing this cost burden, the company decided to develop its complaint management system. To identify the products which were facing major complaints the company decided to resort to its data analytics team. This team was given the task to identify the products, age category,

and state where the customer complaints were high and the need for redressal is high. Following four strategies were implemented.

- Integrating the new acquisition conditions (specific State + Age>60 & PAR Product) in the Sofi Rule engine (Automated Underwriting Solution) at the time of login by the sales team.
- Machine learning led algorithm implemented in the Chat Bot to address all queries at the time of acquisition and various stages of the customer life cycle.
- Auto-Communication Module was developed for after-sales service. (SMS/Hyper Personalised Email Services).
- Whitelisting the customer IDs and their mobile no. at the call centre /IVR Journey for giving priority.

Data Analysis and Interpretation

The available Active Policy Base (Policyholders till Mar 2019) and Complaint Base data were passed through machine learning, multiple classifications (Non-PAR/PAR/Term/ULIP) modeling and propensity score were identified. The outcome was quite interesting and matched the hypothesis initially designed by the data analytics team.

Age Band	Table 1 a: Complaint Base				Table 1 b: Complaint Distribution					Distribution
	PI	PO	Total	PO%	Non-PAR	PAR	Term	ULIP	Total	
< 25	105	5	110	5%	51	47	1	11	110	3%
26-40	932	27	959	3%	326	460	58	115	959	27%
41-60	1172	89	1261	7%	492	567	38	164	1261	35%
60+	405	832	1237	67%	234	752	17	234	1237	35%
Total	2614	953	3567	27%	1103	1826	114	524	3567	100%

Age Band	Table 2 a: Total Active Base				Table 2 b.: Active Base Distribution					Distri- bution
	PI	PO	Total	PO%	Non PAR	PAR	Term	ULIP	Total	
< 25	50095	42099	92194	46%	80209	7376	1844	2766	92195	7%
26-40	427310	31629	458939	7%	220291	165218	41305	32126	458940	34%
41-60	616627	35428	652055	5%	260822	247781	39121	104329	652053	48%
60+	80932	68428	149360	46%	43314	56757	1494	47795	149360	11%
Total	1174964	177584	1352548	13%	604636	477132	83764	187016	1352548	100%

As can be seen from the above Tables 1 (a) & 2 (b) complaints Base and active base, the company categorized the basic types of insurance products into two and named them as PI and PO. The PI, being insurance taken for self and P0 was the insurance taken for others, respectively. The company prepared the complaints and active distribution summary based on four product categories as Non-participative products, participative products, term products, and ULIP products, as can be observed from Table 1 (b) and Table 2 (b).

Based on the analysis of above Table 1(a), the company found that the complaints by PI products were 2614 out of a total of 3567 complaints, and the remaining related to PO were 953 complainants. And again, the total complaints 3567 were categorized in the buckets of age groups of <25, 26-40, 41-60, and 60+ which revealed the fact that the category PO in the age group of 60 + had the highest complaints of 832 out of total 1237 complaints which are amounting to 67% of the PO complaints. However, in terms of no. of policyholders' base (Current Active Base), from Table 2 (a), it was observed that age groups <25 and 60 + groups from P0 had the highest percentage as 46% for both the categories.

From ULIP's active base complaints contribution was 13% in the age group of 41-60 yrs. and complaint base was 19% in the age group of 60+ age group. Maximum complaints came from the ULIP category followed by PAR products and when they related to the age group buckets, they found that the 60 + age group had the highest complaints base from 7 PAR products amounting to 61%.

Age Band	Table 3 (a): Complaint Base Distribution				Table 3 (b): Active Base Distribution			
	Non-PAR	PAR	Term	ULIP	Non-PAR	PAR	Term	ULIP
< 25	46%	43%	1%	10%	87%	8%	2%	3%
26-40	34%	48%	6%	12%	48%	36%	9%	7%
41-60	39%	45%	3%	13%	40%	38%	6%	16%
60+	19%	61%	1%	19%	29%	38%	1%	32%
Total	31%	51%	3%	15%	45%	35%	6%	14%

Again, from above tables 3 (a) on complaint base distribution and 3 (b) on active base distribution, the company came out with the highest distribution as 61% for PAR in the age group of 60 and above.

Table 4: Complaint/Active Base

Age Band	Non-PAR	PAR	Term	ULIP
< 25	0.06%	0.64%	0.05%	0.40%
26-40	0.15%	0.28%	0.14%	0.36%
41-60	0.19%	0.23%	0.10%	0.16%
60+	0.54%	1.32%	1.14%	0.49%
Total	0.18%	0.38%	0.14%	0.28%

Based on the above two distribution, it was found that the 60+ group in the PAR product segment represented the highest complaint as reflected in Table 4. Based on the complaints' distribution, it was observed that 1.32% is the complaints in terms of active base.

Finally, the company concluded that the significant complaints came from the age group of 60+ belonging to the PAR product segment, and hence this was their focus for redressal of grievances by applying a new strategy.

Table 5: PAR Product Division Among Age Groups

PAR - Product	<=25 Yrs	26-40 Yrs	41-60 Yrs	60+ Yrs	Total	% Contribution
Income Plan	2 (4%)	15(29%)	13 (25%)	21(41%)	51 (100%)	2%
Sukanya Participating Plan	1(2%)	17(40%)	9(21%)	15(36%)	42(100%)	2%
Money Back	1(1%)	12(10%)	45(37%)	65(53%)	123(100%)	5%
Endow Saving	4(2%)	43(24%)	73(41%)	59(33%)	179(100%)	9%
Ultra-Guaranteed	3(2%)	38(24%)	45(29%)	70(45%)	156(100%)	8%
Ultra-Saving	1(0%)	48(22%)	44(20%)	124 (57%)	217(100%)	11%
Smart Suvidha	7(3%)	69(30%)	66(29%)	89(39%)	231(100%)	15%
Saving Plus	20(5%)	94(25%)	123(33%)	140(37%)	377(100%)	25%
Money Growth	2(1%)	94(29%)	107(33%)	124(38%)	327(100%)	18%
Rest	6 (5%)	30(24%)	42(34%)	45(37%)	123(100%)	5%
Total	47(3%)	460(25%)	567(31%)	752(41%)	1826 (100%)	100%

Further to know the high complaint-product among its various products under PAR product segment, the company performed an analytical study as under. Hence, the total number of complaints base of 1826 under PAR product segment were categorized under the ten insurance product plans such as Income plan, Sukanya Participating Plan, Money Back, Endow Saving, Ultra Guaranteed, Ultra Saving, Smart Suvidha, Saving Plus, Money Growth and Rest.

Out of the PAR product segment, the product Ultra saving plan was having a high percentage of complaints which stood at 57 percent. The following graph reflects the fact that the ultra-saving plan in the age group of 60 + is having the highest impact.

The company also analyzed product-wise complaints as can be seen from Table 6 below, which shows that the first seven popular product plans have 84% complaints. Also, as can be seen from Table 7 on the reflection cumulative percentage of state-wise complaints, we see the first seven states have the highest cumulative complaints which stood at 90%.

Table 6: Cumulative percentages of product-wise complaints

Product with significant complaints	% Cumulative Complaints	% Cumulative Product
P1	5%	2%
P2	9%	6%
P3	17%	8%
P4	34%	11%
P5	43%	22%
P6	68%	28%
P7	84%	32%
Remaining P8 to P20	88% to 100%	42% to 100%

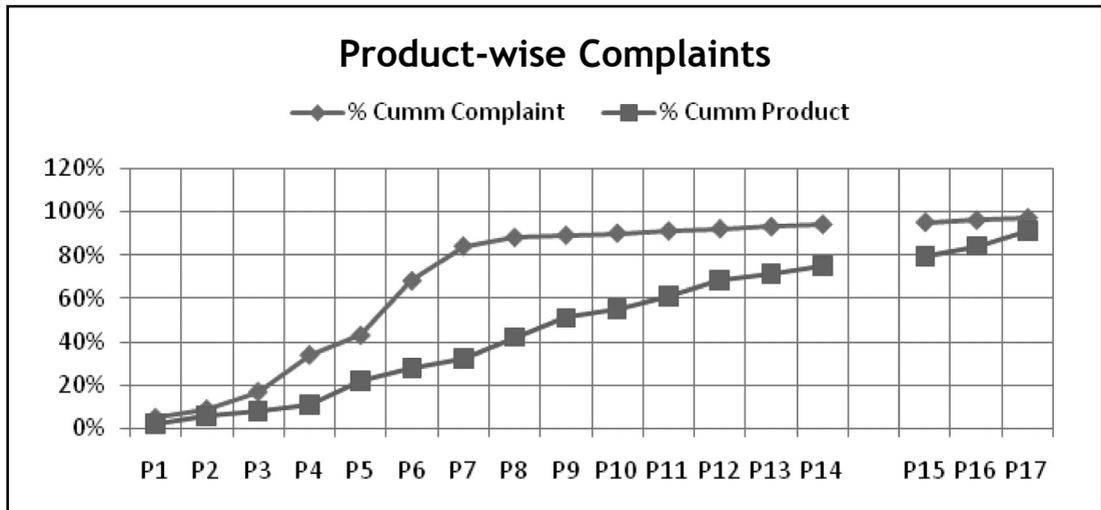
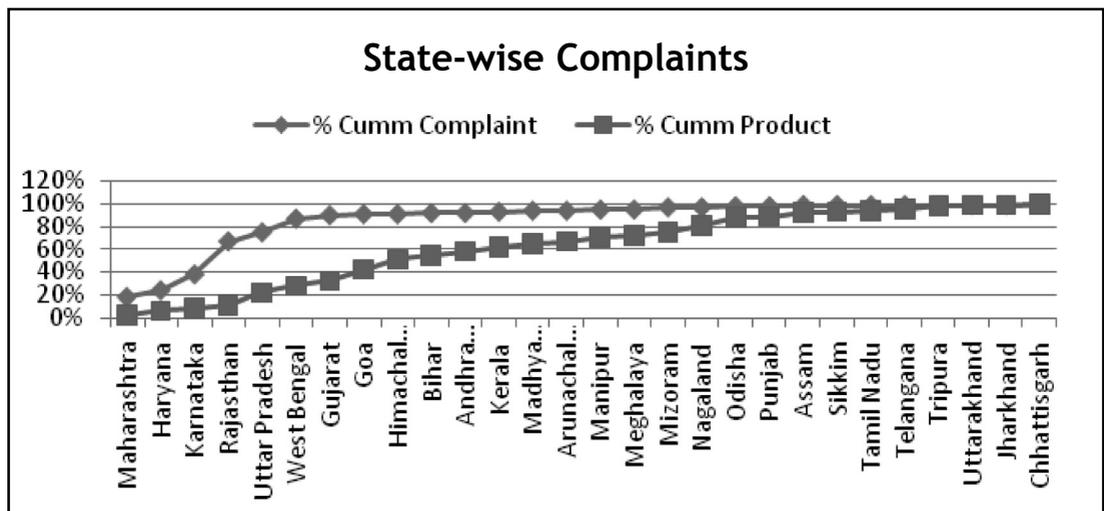


Table 7: Cumulative percentage of State-wise complaints

States with significant complaints	% Cumulative Complaints	% Cumulative Product
Maharashtra	18%	2%
Haryana	24%	6%
Karnataka	38%	8%
Rajasthan	67%	11%
Uttar Pradesh	75%	22%
West Bengal	87%	28%
Gujarat	90%	32%
Other States	91% to 100%	42%



From another analysis of calculating the percentage of the complaints, within the states among the age groups, it was revealed that Karnataka State has the highest complaint percentage of 60% in the age group of 60+ category from 7 states having age category above 60 and PAR products had launched most of the complaints. Based on this, the company developed its own WhatsApp ChatBot and AI-based customer complaint management portal, and android application. The strategy proved successful and the company was able to significantly reduce the complaint management cost.

Post Strategy Implementation Data Analysis and Interpretation

Table 8: Calculation of Percentage of complaints base for 60+ Group with PAR Products and other categories

Product & Age	Total no. of complaints	Total active base	% of Total no. of complaints to Total active base	Complaints/ Total active base * 100	Remarks (about 4% & 96%)
PAR Product & 60+ age category	752	56,757	$(752/56,757) * 100 = 1.325\%$	$(56,757/13,52,548) * 100 = 4\%$	4% of total active base (i.e., 56,757 cases) complaint rate was 1.325% (i.e., 752 cases).
Rest of the Categories of Age with Non-PAR, Term and ULIP Products	2,815	12,95,791	$(2,815/12,95,791) * 100 = 0.217\%$	$(12,95,791/13,52,548) * 100 = 96\%$	96% of total active base (i.e., remaining 12,95,791 cases) complaint rate was as low as 0.22% (i.e 2,815 cases).
Total	3,567	13,52,548	0.264%	100%	

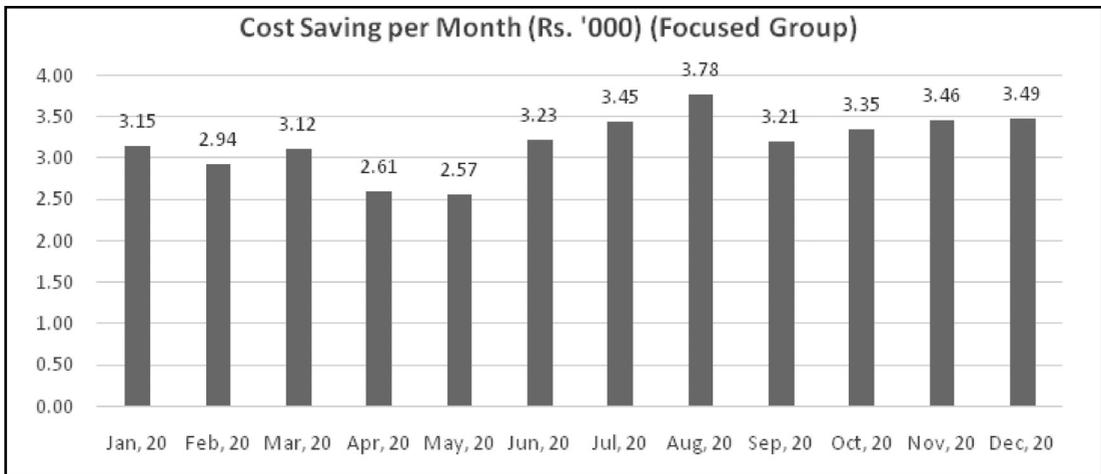
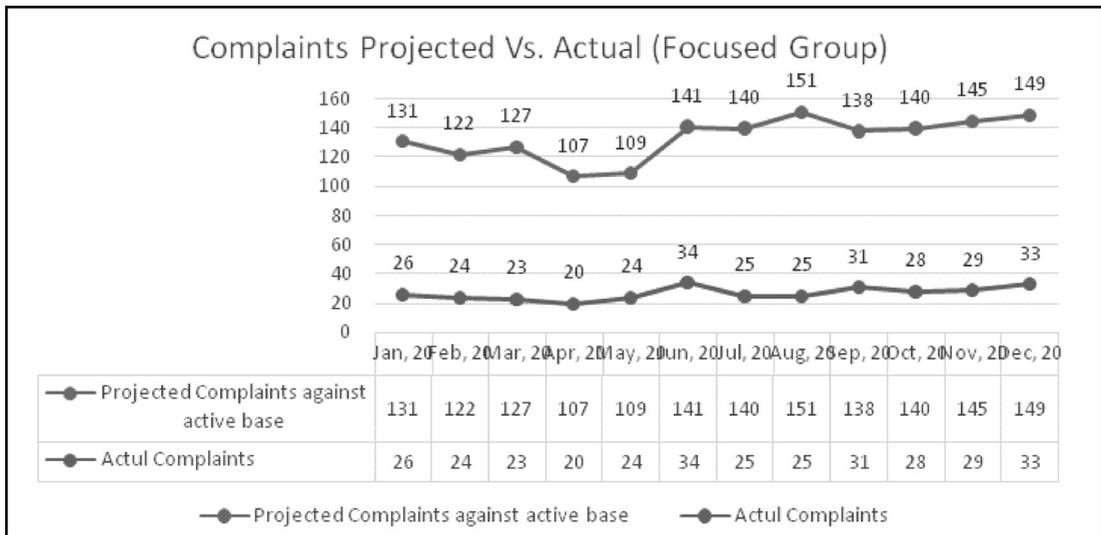
So, considering the remark in column of Age Category above 60+ with PAR Products had significant customer complaints, it was the focused group for which grievance redressal was needed.

The below table is the summary of post-measure projected complaints and actual complaints, and the reduction of complaint number among our focus group of age more than 60 holding Participatory Insurance policy.

Months (a)	Let New Acquisitions (including New Policyholders) is between 2-3 lakhs per month (b)	Projected Complainants out of age 60+ & holding PAR product before taking measures (c)= [(b) *4% * 1.325%]	Actual Complainants out of age 60+ & holding PAR product after taking measures (d)= Actual Complaints received after the implementation of the new strategy	Variance (e)= (c-d)	Total Cost Saving@ 300 per complaint (f)= (e*300) (Rs. 300 is the industry benchmark cost for managing a complaint.
Total Opening Base till Mar, 20	13,52,548	752	-	-	-
Apr, 20	2,47,751	131	26	105	31,511
May, 20	2,30,846	122	24	98	29,421
Jun, 20	2,40,349	127	23	104	31,196
Jul, 20	2,01,934	107	20	87	26,105
Aug, 20	2,06,566	109	24	86	25,735
Sep, 20	2,66,576	141	34	108	32,307
Oct, 20	2,65,018	140	25	115	34,537
Nov, 20	2,85,494	151	25	126	37,800
Dec, 20	2,59,543	138	31	107	32,064
Jan, 21	2,64,296	140	28	112	33,547
Feb , 21	2,72,974	145	29	115	34,648
Mar, 21	2,81,262	149	33	116	34,894
Total		1,602	323	1,279	3,83,765

In the above table opening base row indicated the total number of active cases and the number of complaints received from our focused group (60 + Age Category with PAR Product) till now. It was assumed that there were new cases between 2 to 3 lakh per month across India (which is normal for this industry). In column (b) random numbers between 2,00,000 to 3,00,000 were taken which signified several new cases per month. The figures in column (c) showed the number of new complaints from the focused

group had there been no measures taken to redress the complaints received from the focused group. In column (d) showed the number of new complaints from the focused group after measures taken to redress the complaints received from the focused group. In column (e) the variance was shown which was the difference between the number of complaints projected had there been no measures taken and actual complaints received after the new strategy for addressing the customer grievances was launched. We can see a significant reduction in the number of complaints yearly total of which is 1,279 cases. In column f we have multiplied the monthly reduction of cases by Rs.300, which we have considered the cost of redressing grievances had it been outsourced. It was also shown below graphs.



The above data highlighted that a significant amount of Rs.3,83,765 related to complaint management cost could be saved and after implementing new strategies, the actual no. of complaints above the age category 60+ with PAR products (Focused group) lowered down significantly.

Conclusion

The new strategies of development of WhatsApp, Auto communication module and White ID creation proved successful and the company was able to significantly reduce the no. of complaints. Also, the company could save complaint management costs of Rs.3,83,765 during the year. Now, the company was self-reliant for customer complaint management. This had reduced the dissatisfactions of the customers. A satisfied customer will be loyal and he/she will be our indirect brand ambassador. The timely address of the grievances of the customer's complaint is the key to be a successful in-service industry like Insurance.

Questions for Discussion

1. What is the mechanism used for the redressal of the grievances by the Insurance Industry and Jeevan Sanjeevani Insurance Ltd.?
2. How can data analytics and data science be used for the redressal of customer grievances by Insurance Companies and various service industries?
3. Could the company achieve significant cost saving through the application of a new strategy in the given case?

Teaching Note

Enhancing Customer Experience

Synopsis of the case

By March 2020, the Indian Insurance Industry was reported at US\$ 280 billion. It was expected to grow at 15% average growth in the next five years. The growing need for insurance among common people required innovative products along with a proper distribution channel to reach common people. In FY 2019 total premium paid was only about 3.71% of GDP. It was much lesser as compared to the other developed countries in the world. And hence there was a possibility of very strong growth in the micro-insurance sector, especially in rural India. After FY 1999 the entry of private

players in the insurance sector had changed the facets of the Insurance Industry and a lot of innovative products were introduced to date. But, along with creating innovative products, customer satisfaction had become a very important factor for the survival of the companies. A satisfied customer is a key to success in the service industry like insurance. In this case, Data Analytics was used to analyze the data related to the grievances of the customers, and new strategies based on machine learning and AI-ChatBot were designed to address the customer grievances. The strategy went well which had significantly reduced the customer grievances and resulted in cost-saving.

Target Learning Group

This case study can be taught in Universities through their MBA curriculum, B-Schools offering Post Graduate Diploma in Management. It can be used as Training Material for Executives undergoing training in Insurance Management, Data Analytics, Marketing Analytics, and Integrated communications.

Learning/Teaching objectives and key issues

The following are the teaching objectives of this case:

- Understand the concept of data analytics, customer relationship management, and services management.
- Analyze the customer grievances to provide a better customer experience.
- Develop the new age strategies by applying data analytics techniques, Machine algorithms, and artificial intelligence.
- Develop crisis management skills to handle challenging situations.
- Create models using Excel and different data analysis to solve business problems.

The teaching strategy

The prime requirement for this case study is that the learner must be aware of basic analysis in Excel or a similar kind of analysis software. The case should be given to the learners at least 2-3 days in advance and they should make the prior reading and analysis of the case before coming to the class. The class may be distributed in a small group of students. Each group may consist of 4-6 students. Each group has to analyze the case and write down the points of consensus. Every group will present the case

analysis for discussion. Each individual/ group may be put forth its interpretation and suggestions concerning the issues and challenges involved.

- **Individual Assessment:**

The students may be asked to apply various strategic frameworks like SWOT and come out with foresight on what is happening in the service industry like insurance. The students should also use the pre-reading materials to connect with the data and situation given in the case study.

- **Group Assessment:**

Students may be asked to adopt a role-play, e.g., as CEO, head of Data Analytics, head of CRM to discuss the strategies to address the problems given in the case in front of the board members. Also, a PowerPoint presentation can be presented by the head of data analytics and head of customer relationship management.

- **Teaching plan:**

Introduction of the Case (10 Min), Profile of the Insurance Company and industry (10 Min), Data Analysis and Interpretation (30 Min), Issues and Challenges and its mitigation strategies (10 Min), and Summary (10 Min).

Questions

- i. What is Insurance, and what are the different types of Insurance?
- ii. Perform SWOT Analysis of Insurance Industry?
- iii. Insurance is the need of an hour; do you agree?
- iv. What do you understand by customer grievance? According to you what could be the different causes of grievances in the Insurance industry?
- v. What do you understand by the term Data Analytics? How this can be used to find out the causes of customer grievances?
- vi. What are the measures the company in this case has taken to reduce its customer grievances?
- vii. How much cost saving was possible after taking the proper measures to address the customer dissatisfaction?
- viii. Apart from cost saving what other benefits a company can get by having an efficient Customer Grievance Redressal team/policy?

Analysis of data

In this case, the data was analyzed through MS Excel. Formulas and Graphs were used to interpret the data.

Background Reading

- a. <https://www.ibef.org/industry/insurance-presentation>
- b. <https://www.ibef.org/industry/insurance-sector-india.aspx>
- c. [https://www.ibef.org/industry/insurance-sector-India.aspx#:~:text=7.31%20trillion%20\(US%24%2094.7%20billion,FY19%20from%202.71%25%20in%20FY02.](https://www.ibef.org/industry/insurance-sector-India.aspx#:~:text=7.31%20trillion%20(US%24%2094.7%20billion,FY19%20from%202.71%25%20in%20FY02.)
- d. <https://www.irdai.gov.in/>
- e. <http://mospi.nic.in/104-insurance-statistics>
- f. Fundamentals of Business Analytics by Prasad, Acharya; Wiley publication
- g. Tata Consultancy Services, 2009." Innovation in customer relationship management", pp.3-5.
- h. Trepper, C., 2000. "Match Your CRM Tool to Your Business Model," Information Week, p.74

Experience in using the case

This case being new needs testing, but it provides the learner an opportunity to understand and develop management strategies for enhancing the customer experience by applying data analytics techniques and using new-age technologies.

Case Study 02

Demerger of Libra Tyres Ltd*

Introduction

Peter joined Libra Tyres Ltd (LTD) as its Chief Operating Officer (COO) in the year 2019, at a time, when the company was sailing through the difficult tides of demerger. With a past experience of more than 25 years in the tyre industry, Peter has grown from a sales executive position to the present COO position over the years. His sportsmanship traits as a cricketer gets reflected in all the challenging jobs taken up by him. Currently, the position offered in LTD was such that he could take decisions for turnaround of the company and implement them without any interference. So, Peter was all excited and started his activities from day one. He wanted to bring the company back to the track. However, Peter reflected that the road was long and there were many issues and challenges that the company was facing.

Background of the Company

Libra Tyres Lt (LTD), a division of Kashiram Industries, was established in the year 1991. LTD manufactures tyres for automobiles, motor cycles, commercial vehicles, farm vehicles and heavy earth-moving machinery. The company has over 340 sales depots with more than 982 sales engineers and 17,662 dealers at major locations. Libra Tyres International network stretches across 17 countries worldwide. The company also won the Capexil Special Export Award for its exports in the year 2012-13. LTD has built a solid reputation for its quality and is being recognized as one of the best tyre manufacturers in the country.

There are two types of tyres. Bias tyres and radial tyres. Bias tyres are commonly used in heavy vehicles like trucks, farm vehicles and buses. On the other hand, radial tyres offer better ride quality due to greater traction. They are usually preferred for Hatch back, Sedan, Sport Utility Vehicles (SUVs), etc. The tyres manufactured by LTD are bias tyres. Bias tyres are of relatively older design and have shorter tyre life. Most

* This case was developed by Vandana Samba (St. Joseph's Degree & P.G. College, Hyderabad), V. Annapurna and V. Jayalakshmi (Siva Sivani Institute of Management, Hyderabad) and P. Ganesh Anand (St. Joseph's Degree & P.G. College, Hyderabad) during the Online Case Writing Workshop organized by the Association of Indian Management Schools (AIMS) from April 21-23, 2021.

of the vehicles presently use radial tyres because of the advantages they offer over bias tyres. Therefore, there has been a surging wave of demand in the past few years for radial tyres. Tyre manufactures in the market are manufacturing different types of radial tyres based on their specific applications. So, with an eye to expand into the fast-growing radial passenger car tyre segment and improve the market share, LTD had planned to set up a unit which has remained unfinished for many years. The Kashiram management has been looking to fix the tyre business for years but a turnaround has proved unclear.

In the year 2019, LTD carved out of Kashiram Industries, its parent company. Despite stable performance of the parent company, the losses from LTD were dragging down the returns of Kashiram Industries as a whole. Therefore, LTD has been demerged from Kashiram Industries limited and post-demerger LTD has to make a niche presence for itself in the market. The company is in a grave position and is trying to survive the post demerger shocks. With less than 10 percent market share and a dipping stock price, the company is facing rough tides in the market.

Post demerger, the company's facilities in Odisha were revamped to maximize capacity utilization through an innovative mix of existing and new product lines. After a very difficult phase of almost two years after demerger, LTD has reported Gross Sales of Rs.943.4 Cr and Total Income of Rs.1076.93 Cr. But the EPS is still negative. However, the company has a strong brand value in the market. Therefore, the share price is at a rise in the stock exchanges. LTD's current market capitalization stands at Rs.627.4 Cr. LTD has built up a new world class R&D facility to carry out its research. Further, LTD is also making use of technology to come out with innovative and efficient products that serve the customer best. The Pandemic Covid-19 had pushed the company down with more challenges and problems. Thus, the company was sailing through the difficult tides of demerger.

Issues and Challenges faced by the Company

Financial Issues

The company is struggling with lack of funds and there are no revenue inflows. The working capital needs are primarily sourced from Advances from dealers as well as exports. Its current market capitalisation stands at Rs.627.4 Cr. LTD uses 'Nylon' as the raw material for manufacturing of tyres which is imported from China. The raw material cost occupies a major portion in the manufacturing cost of tyres. Post covid-19 there has been a rise in raw material to the extent of 1 percent. Increase in raw

material price lead to increase in cost of goods sold, but the selling price of tyres cannot be increased because of competition in the market. This has affected the bottom line of the company. The fixed expenses were very high; the finance charges were also too high. The company was running in losses to the extent of 577.98 crores. LTD share is trading at Rs.44.50.

Marketing Issues

The company produces Bias tyres which are very primitive in nature whereas the competitors produce radial tyres which improve rider efficiency and comfort. The sales of the company were to the extent of 13 to 14%. Since the company was in huge financial crunch, it was not in a position to spend a huge amount on promotions. On the other hand, LTD cannot think of increasing the price as competition is prevailing in the market. For expansion into the fast-growing radial passenger car tyre segment and increase the market share, LTD needs funds to set up a radial tyre manufacturing unit.

Human Resource Issues

The company has 2, 000 employees working at different levels and holding different portfolios. Though the company has standard operating procedures, there exists a lot of unrest among the employees because the HR policies were not implemented properly. This also sometimes resulted in bottlenecks at the manufacturing division. In 2018, the company was unable to pay salaries due to losses. Again, in January 2020 the employees were on strike for non-payment of salaries and the impact of Covid-19 worsened the situation. The attitude of the employees is one of the major points of concern to the management. The pandemic Covid-19 created a lot of disturbance in the work style and delay in the payment of salaries, etc., which has affected the morale of the employees to a greater extent.

Operational Issues

The company imports raw materials from China and Russia. Recently the import of raw materials from China has been stopped because of the ban imposed due to Covid-19. The raw material lead time was 30 days. Because of low demand the total capacity of the plant was not utilised by the company. The plant capacity was used only to the extent of 20-22%. The outsourcing facilities extended by LTD to the competitors was to the extent of 30% of the capacity. The remaining 50% was the idle capacity. Low morale of the employees resulted in bad maintenance of the plant due to which the production got affected and employees were working on and off. A lot of CSR activities

were taken up by the organisation, which is a clear indicator of sustainability. LTD not only distributes drinking water, but also invests in providing drinking water facilities in the local area. With the aim of protecting the environment, LTD has been running sapling tree planting projects in and around the plant in Orissa.

Post Demerger Challenges

There are numerous challenges the company is facing in the current situation. Firstly, there is a lot of financial burden on the company to meet the working capital needs and to survive in the long run. Secondly, the company has to improve its market share which is less than 10% currently. Thirdly, there exists an unrest in the company and low morale among the employees. Effective utilisation of the plant to the fullest capacity is yet another challenge. Finally, the lead time in the procurement of raw material needs to be addressed.

Road Ahead /Future plans

The company is in negotiations with multiple prospective partners both within the country and overseas for strategic collaboration. The company is also in discussion with prospective partners and funding agencies and is confident that the deals would be finalized in the year 2022. The company is also planning to utilise the idle capacity by the end of the year.

Peter sat in his office contemplating about the turbulent times and the rough road ahead for him and the company.

Questions for Discussion

1. Identify the leadership style that is to be exhibited by Mr. Peter (COO) in the post demerger scenario of LTD.
2. Discuss the strategies to increase the market share of LTD.
3. Evaluate different sources of finance that can be tapped by LTD to meet the present expenditure and to improve the market share.
4. Perform a SWORT Analysis of LTD.
5. Design the financial strategy to increase the profitability of the company.

ANNEXURE

Libra Tyres Limited		
Regd. Office : 199/10, Kolkata - 700 001		
Statement of Standalone Unaudited Financial Results for March 2020		
(Approved by the Board of Directors on 8th March, 2021 after review thereof by the Audit Committee)		
Rs in Crores		
S.No	Particulars	Year ended 31/3/20
1	Income	
	a) Revenue from Operations	943.4
	b) Other Incomes	133.52
	Total Income	1076.92
2	Expenses	0
	a) Cost of Materials consumed	507.56
	b) Purchases of Stock-in-trade	50.9
	c) Changes in Inventory of FG, WIP and Stock-in-Trade	77
	d) Employee Benefits	243
	e) Depreciation and Amortization	72.1
	f) Financial Charges	303.48
	g) Power and Fuel	68.54
	h) Packing and Carriage	48
	i) Other Expenses	275.64
	Total Expenses	1650.2
3	Profit / Loss before Exceptional Items and Tax	-573.34
4	Exceptional Items	0
5	Profit / Loss before Tax	-573.34
6	Tax Expenses	0
	a) Current Tax	0
	b) Deferred Tax	0

7	Net Profit /Loss for period	-573.34
8	Other Comprehensive Income (Net of Tax Expenses	-4.64
9	Total Comprehensive Income	-577.98
10	Paid-up equity share Capital	285.18
11	Reserves excluding Revaluation Reserves	-851.32
12	Earnings per share	0
	a) Basic EPS	-40.22
	b) Diluted EPS	-40.22
Statement of Assets and Liabilities		
A	Assets	year ended 31/03.2020
	1) Non-current Assets	
	Property, plant & equipment	1015.94
	Capital Work in Progress	1550.88
	Rights of Use assets	17.9
	Other Intangible assets	0.06
	Financial Assets	0
	Other Financial Assets	10.6
	Other Non Current Assets	132.44
	Total Non-Current Assets	2727.82
	2 Current Assets	0
	Investments	153.64
	Financial Assets	0
	Trade Receivables	230.9
	Cash and cash Equivalentents	6.32
	Other bank Balances	33.38
	Loans	0.5
	Other Financial Assets	2.5
	Other current Assets	101.74
	Total Current Assets	528.98
	Total Assets	3256.8

B	Equity and Liabilities	0
	1. Equity	0
	a) Equity Share Capital	285.18
	b) Other Equity	-851.32
	Total Equity	-566.14
	2. Non-Current Liabilities	0
	Financial Liabilities	0
	Borrowings	1239.1
	Legal Liabilities	12.44
	Provisions	301.28
	Other Financial Liabilities	32.28
	Total Non-CurrentLiabilities	1585.1
	3. Current Liabilities	0
	Financial Liabilities	0
	Borrowings	471.96
	Lease liabilities	6.96
	Trade Payables	0
	Total Outstanding dues of micro enterprise and small enterprise	11.6
	Total outstanding Creditors	534.52
	Other Financial Liabilities	945.6
	Provisions	127.3
	Other Current Liabilities	140.34
	Total Current Liabilities	2237.84
	Total Equity and Liabilities	3256.8

Teaching Note

Demerger of Libra Tyres Ltd

Synopsis of the case

The case captures the post demerger scenario faced by Libra Tyres Ltd (LTD) from its parent company Kashiram Industries Limited. It discusses different issues and challenges faced by the company and action taken by the company to strengthen their position in the market. It also talks about the challenges faced by the company in order to survive while dealing with the post demerger. The future plans of the company to bring the company back to the track are also detailed.

Target learning group

This case can be taught at multiple levels, with focus on different functional areas varying in depth, depending on the learning outcomes and objectives defined by the teacher. This is a Strategy Management Case from Marketing, Human Resource, Financial Management, Leadership, and Operations perspectives. The case can be taught at the Undergraduate level as well as the Postgraduate Level and also to the Corporate Executives. The focus on the issues and depth of enquiry can be moderated depending on the qualifications and calibre of the attendees.

The Learning/teaching objectives

The Objective of this case is to ignite leadership spirit and the positive attitude to face challenges and never to give up in life and always be ready to adapt to the ever-changing world. The objective of the case can be summarized as follows:

After completion of the Case Study, the student will be able to

1. Understand the difficulties faced by a leader in tiding through rough waters.
2. Identify the key areas for building trust and gain employee loyalty, especially in difficult times.
3. Develop strategies keeping the common well-being of all stakeholders.

Teaching Strategy

Based on the targeted audience and suggested objectives, the following four main strategies can be adapted for teaching the case. These strategies could be used

separately or in combination depending on the session (level, depth) and the learning objectives and outcomes that the teacher would like to convey and achieve.

i. Leadership Strategy

Peter is a self-made man and his Leadership style is participative in nature. He is a very ambitious person. He is ready to take up any challenges in life. His **never-to-give-up** attitude in fact **would** definitely tide him over all the rough waters.

ii. Human Resource Strategy

The company must plan to establish a full-fledged Human Resource Strategy Department with Policies as the company does not have it after demerger. Work culture and employees' attitude and morale are to be boosted up. A proper role clarity should be given to the team leaders. Since Employees are the Human Assets of the organisation, they should be treated with utmost respect and care, if this is implemented all the egos will vanish and employees will contribute much for the growth of the organisation.

iii. Financial Strategy

The company has to concentrate on improving the current assets position of the organisation which leads to the increase in working capital. The working capital is very important for the organisation because it is the life blood of an enterprise. Gaining the investor confidence is quite important because it can stop depending on the external borrowings. The market share should be improved. The company has to improve financial aspects after demerger as company's financial statements are showing negative profits. Capital Structure of the Company is to be improved by introducing issue of new shares and reducing the debts of the company.

iv. Quality and Operations Strategy

Effective Utilization of Full Capacity of Plant is important. As of now 20% capacity is utilized by the company. It is trying to collaborate with other companies. Adequacy of Raw Materials supply to find the new vendors from domestic and foreign markets is to be addressed. Lead Time in production needs to improve as they have 60 days now and the company is planning to get it down to 10 to 25 days.

v. Marketing Strategy

Market Share of the company has to be improved which is less than 10% as of now. The company has to concentrate on promotions of the product. The company

has to improve its Exports and Domestic Sales as the revenue generation is less from sales. The company should come out of producing bias tyres and as to concentrate on producing the Radial tyres in order to win the customers and to have a competitive advantage with the competitors like - JK tyres, Apollo tyres and MRF, etc.

The teaching pedagogy for the case would be a participative one wherein the students can be made in small groups to share their ideas and opinions.

Teaching Plan

Time	Issues and Questions
10 min :	Introduction: The Teacher can start the class with a poll on the perception of the participants on their priority to join a big branded company not in good shape or a small profit making company. Group Activity. The teacher can divide the class into groups with 4-6 participants and ask them to present their thoughts on the reasons or justifications for the choice made.
20 min :	Understand the difficulties faced by a leader in sailing through rough waters. The students are to highlight the issues the company is currently facing. The students can be made to probe into the challenges likely to come up in the near future, if the issues are not addressed at the right time.
20 min :	Identify the key areas for building trust and gain employee loyalty, especially in difficult times. The students can be asked to suggest ideas for building trust. The students can also be asked to comment on the Leadership style of Mr. Peter.
20 min :	Develop strategies keeping the common wellbeing of all stakeholders. The students can brainstorm for ideas to frame the future course of action for the company.
20 min :	Takeaways and Learnings: Post discussion of the case thoroughly, the Teacher can now take a poll on the perception of the students on their choice. They can also comment on the choice made by Mr. Peter. Finally the learnings from the case can be discussed.

Questions

1. Identify the leadership style that is to be exhibited by Mr. Peter (COO) in the post demerger scenario of LTD.
2. Discuss the strategies to increase the market share of LTD.
3. Evaluate different sources of finance that can be tapped by LTD to meet the present expenditure and to improve the market share.
4. Perform a SWORT Analysis of LTD.
5. Design the financial strategy to increase the profitability of the company.

Analysis of data

Porter's Five Forces Analysis, which is an important tool for understanding the forces that shape competition within an Industry involving Competitive Rivalry, Supplier Power, Buyer Power, Threat of Substitution and Threat of New Entry. The case also paves way to analyze from the point of view of "Value chain analysis" and any other appropriate qualitative techniques can also be used. With regard to the strategies of Libra Tyres, SWORT analysis can be used to analyse the case.

Suggested Readings

1. Jim Collins, *Good to Great: Why Some Companies Make the Leap... and Others Don't*, Publisher Harper Business (2001).
2. *The 7 Habits of Highly Effective People: Powerful Lessons in Personal Change*, by Stephen R. Covey & Jim Collins, Publisher Free Press (1989).
3. *Leadership and Performance Beyond Expectations*, James McGregor (1978).
4. <https://www.feedough.com/direct-marketing-definition-types-strategies-examples>.

Experience of using the case

The Case is yet to be used in the class.

The case would enable the students to handle multi-dimensional problems as a Leader.

Case Study 03

Change Management through Technological Intervention*

About the Company

Shri Radhye Pesticide Company was a company dealing with selling of Pesticides, nationally, with its head office in the state of Rajasthan, India. The company was a large organization that used to deal with the sales of pesticides, but as it wanted to expand and modernize itself, it shifted its base from the state of Rajasthan to Haryana state in north India, so that it may be located in the pesticide action hub of the country, covering the northern belt as well as other parts of the agriculturally rich states. After shifting its base from Rajasthan to Haryana, the company went on to improve upon the other major factors responsible for the growth and progress in competition with the leading players.

Change and Technological Upgradation

The top management of the company decided to automate the working to more professionalism and technological expertise. The management of the company decided to incorporate and integrate the data management system by shifting on the platform of ERP (Enterprise Resource Planning) and SAP (Systems, Application and Products, in data processing). Initially the work force was reluctant and were skeptical about the implementation of the SAP into the integration of the systems, but the management of Shri Radhye Pesticides went ahead to put together a team of senior professionals which in turn put forward a user manual in place so as to kick start the process of automation in the company using SAP.

As the workforce was more from the rural segment, they were very skeptical and were slow to adapt to change, as also the main concern of the workforce was the job

* This Case study was developed by Subhash Masih (Vikrant Institute of Management, Indore, Madhya Pradesh), Danam Tressa (St. Joseph's Degree & PG College, Gunfoundry, Hyderabad, Telangana), Yogita Patil and Rahul Trivedi (G. H. Rasoni Institute of Business Management, Jalgaon) and Sreeparna Bhattacharyya (Bhartiya Vidya Bhavan, Kolkata) during a 3-day Case Writing Workshop organized by the Association of Indian Management Schools (AIMS) from April 21-23, 2021.

threat by the advent and implementation of technology. As this scenario was prevailing during the year 2003-04, the technology was feared upon to a great extent and was mainly foreseen as a threat to the jobs, especially at the operational level. It was a matter of a great challenge for the management to educate the workforce regarding the implementation of the technology and to align the workers with the long term benefit of the technology to the growth and progress of the company. The management was not only aware of the technological up-gradation in the field of the pesticide companies, nationally and globally, but was also aware of the necessity of the implementation of the technology for the long term growth and progress of the company in the competitive market.

Core Management Team and Cost Effectiveness

The Core team formed for the upgradation brainstormed to a great depth to understand the possible threats and advantages in terms of the technological advancement. It did an in-depth SWOT analysis to assess the strengths, weaknesses, opportunities and impending threats of bringing about the change in the company. The core team worked together and formed a system that would implement the integration of the various processes, so as to automate the overall working through SAP. It was ensured that once the system of ERP is implemented into the company, then there would be no data entry or data feedback through excel or such standalone software. As the core team realized that it was most important to have a common and reliable source of data, it ensured that all the sources of data would not only be authenticated and would be from the ERP pool, whereby the entry would be formalized and would be authenticated to a reliable data source or a person in that case.

Data Authentication and Source

Once in the process of automation through ERP, it was decided that all data would only be fetched through the ERP in relation to pesticides, as to where the pesticides are selling, all the past and the future sales figures, what is the demand, in relation to the past figures and the current scenario, the material department on the basis of the analysis and the commercial requirement from various areas. All the key personnel and the decision making authorities would shift to one platform through which they can take systematic and common decision. The best part was that the ERP was an integrated process and anyone at whatever stage of the company they are, would get the same data and would have no differentiation in the decision making data that would be available to them, especially the top management. It was now the best asset

of the company to have a universal data source and in turn would now have a common pool of data from which the decision making threads would be integrated.

Implementation of the Automation Process

The first and the foremost job of the core team formed by the management for the implementation of the technological up-gradation, from the group of senior HR executives, was to educate and inform the operational group of the supervisors and workers that the company does not intend to threaten the job scenario, but is planning to upgrade itself to the next level of competition that would be necessary to survive in the ever-growing pesticide sector. As also it would be important for the company to take proactive steps in the direction of the growth and technological advancement, if it has to grow and outsmart its competition. Once that part of HR education and confidence building was taken care of, all the core team of the management for technological advancement had to focus upon the best possible technological, electronic and integrated data management system to be implemented.

Implementation of ERP – Enterprise Resource Planning

The company had been greatly benefitted through the implementation as the next level of the working was attained and had the common controlling manual for the core team available. The implementation of the SAP was done in the year 2003-2004 at the cost of approx Rs.4 crores, which was a lot then in terms of the expenses incurred on the SAP, but the agencies that were involved were professional and did the best of the job to integrate the system. As Radhye Pesticide company was futuristic in its approach and took a great deal of planning and brainstorming to conclude upon a system that would give the company a great boost in technology and would place it at a head-start for the future operations, pertaining to its long term financial growth. The best of the companies in the technological platform were involved, that included a great deal of cost to the Radhey Pestiside company on the up-gradation head, but it was thought off as a necessity by the top management.

The Dry Run

HCL, Infosys, etc., were some of the big names that were involved in the implementation of the SAP for Radhye Pesticides Company and did customize the execution of the ERP. Once the basic implementation was put in place the trial run was conducted to ensure that the result is in the line of expectations. The heads of the departments and other decisive persons were brought into the execution of the system so that they may provide with their inputs at the time of the dry run and in case of any

changes it may be possible to implement at the testing time. As the cost of the implementation of the automation process was an important aspect, it was necessary to control the cost at its initial stage and that part could only be done while the process of dry run was being conducted. The ERP was then implemented and installed on the final run, authorizations and the number of the users was set, as this was important for the costing to be in control as it would have increased along with the number of active software users.

Technological Advancement

All the data that was entered into the ERP has to be entered through the right set of people that are responsible for the input of the data into the system, such as the team leaders, supervisors, production in-charge, etc., and hence the data was authenticated and then entered into the system and also any changes that are being done in the system or any data entered has a person responsible for having done the same and would be held accountable. Also the checks and the balances are in place and would be referred back in case of any divergence. The company not only progressed to a great extent in case of the data efficiency but also incorporated several measures for the welfare of the employees, such as Golden Hand cuff methods, where the employees would get extra benefit for being with the company to an extended period of time.

Outcome

It took 9 months for the system to be implemented and put across in place, including the trail and testing part of the ERP, but as the Radhey Pesticide Company was determined to upgrade itself on the platform of EDMS (Electronic Data Management System), the company went ahead with its plan to upgrade itself technologically. The ERP system has proved to be a great success for the Radhey Pesticide company as along with technological up-gradation and other decisions that the company took and went ahead with single minded resoluteness in the realms of the future, the turnover of the Company from the year 2003-04 to current stage has gone from 300 crores to a whopping 2000 plus crores of rupees. As also the pesticide plant which was one in the year 2003-04 has now expanded to 3 plants, thus increasing its net worth and the production manyfold.

The Final Scenario

So finally the study of Radhey Pesticide Company shows that once proper planning and implementation are done, taking into consideration the human resource sector, the technological advancement may prove to be a great factor of growth, not just in

terms of the financial turnover, but also in terms of the overall growth and progress of the company and its employees. The top management was sensitive to the fears and limitations of the workers and supervisors; hence it not only took a great deal of effort to educate the lower strata of workers but ensured that the technological advancement in the form of implementation of ERP, would not be a threat to the job prospects of the workers but would ensure that the Radhey Pesticide would grow on an exponential path over the period of time, thus justifying the great deal of funds that were routed in the implementation of the technology.

The Unfolding of the Future Trends

Also it is a matter of great deal of pondering that if the company has not upgraded itself technologically and in terms of educating its workers for change management, would the company have progressed to the extent that it did or would the outcome and progress over the period of next 17 years (till date) would have been different than what it was. These are some of the important aspects to think and explore upon.

Questions for Discussion

1. How did Shri Radhey Pesticides complete its implementation in a short time?
2. From this case, draw on the key factors responsible for the success of the implementation?
3. What competitive advantage would Shri Radhey Pesticides have in the early Implementation of ERP?
4. What was the response of the employees in accepting the new system into the company and how did they overcome it?

Teaching Note

Change Management through Technological Intervention

Synopsis of the case

This Case deals with Shri Radhey pesticides a company that deals with the production of pesticides. They are into the production of insecticides, fungicides, herbicides and bio-pesticides in the country. Shri Radhey Pesticides enjoys the prestige of being one of India's leading agrochemical limited companies and is also listed on the Bombay Stock Exchange and the National Stock Exchange of India. The company was recently named a "Great Place to Work" for the fiscal year 2018-19 and has been doing great.

The company is headquartered in Rajasthan and operates in the states of Gujarat and J&K as well. Established in the year 2003 with an annual turnover of around Rs.400 Cr per annum, the company now aspires to thicken its annual profits and attempts to modernize its modusoperandi.

The company announces its aspiration of introducing Enterprise Resource Planning software to have a single repository for all the functional departments to fetch real-time data at any point of time. With an extent of assigning the privilege of having remote access to some departmental heads viz i) Sales ii) Material and iii) Production so that the process may be aligned, information is collated, strategic decisions could be made and the entire team works in perfect synchronization. The company further announces to relocate its Head Quarters from Rajasthan to Haryana including its entire R & D division. "It's always easier said than done" – the announcement could invite immediate challenges for the company both at the level of the Organisation itself and its employees. Individual Challenges included immediate resistance from the employees learning about ERP being introduced based on the following insecurities:

1. Job Security
2. Composition of the new portfolio if at all they are retained
3. Compensation and benefits in response to relocation
4. Resistance to move to a new state

Whereas the Organizational Challenges included the following:

1. Deciding on the right way to communicate to their existing employees that a new system will only increase the efficiency of the work to be done. Importantly, it was not to cut their jobs but to make them better.
2. Identifying the right talent to complement the new process at the same time upgrading the existing workforce by providing adequate training at all levels of employees.
3. It also included recruiting the workforce which invited cost over and above the cost of relocation and implementation of ERP.
4. An extension to this challenge was also retaining the right talent once they have been trained and have been well equipped with the new technological changes.

5. Designing the right compensation plan and clearly defining the benefits to strengthen the employee retention policy.

The third major challenge was the implementation of ERP itself. Implementation of ERP had to have an intervention and set up being done by IT giants like Infosys - Siemens & HCL which called in for a cost of Rs.4 crores exclusively for the set-up and a duration of 9 months for the process to go completely functional.

Till that time, the company had to bear the cost of its traditional functioning and an additional cost of the new ERP being set up.

Phases of ERP implementation

Phases	Activities
Implementation methodology- Project	<ul style="list-style-type: none">• Organization Management support• Project Plan• Budget• Performance• Risk Assessment
Team Formation	<ul style="list-style-type: none">• Manpower• Skill sets Assessment• Training Need & Strategies
Prototyping	<ul style="list-style-type: none">• Issue List• Software Functionality• Documentation
Go Live/Review	<ul style="list-style-type: none">• Problem Resolution% Review
On-Going	<ul style="list-style-type: none">• Continuous improvement• Upgrading new software

Eventually, the company could overcome all the stated challenges and could reflect outcome enhanced efficiency. A testimony to the fact was a rise in profit margins from Rs.400 Cr in 2003 to 2000 Cr in 2021. Growth close to 5 times since its inception in just 17 years. Other benefits included-

- Integration of business processes which meant retrieving any data was now a matter of a few clicks.

- Details of all the finished, semi-finished and raw materials, vendor-suppliers and customers, services were now available in one central repository.
- Efficient business processes improved productivity and a reduction in the number of credit management errors. There have also been significant savings in manpower, inventory levels and resource management.

The Target Learning Group

This case study attempts to help the students of business for both Postgraduate and Undergraduate students.

2. The learning/teaching objectives and key issues (*Set out the learning/teaching objectives, and identify the key issues in case that will help achieve them.*)

Learning objectives of the case

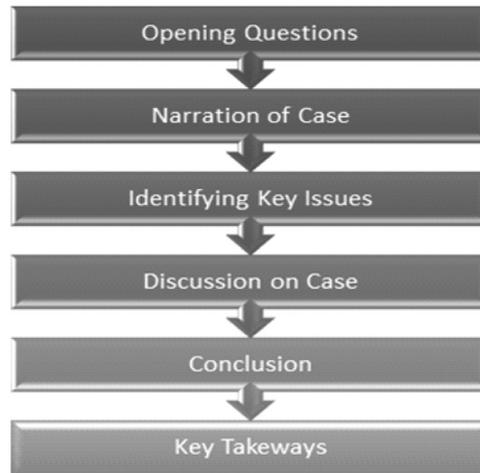
1. To understand the organizational perspective about the expansion of business.
2. To study the different factors of change management and allied issues.
3. To introduce a proper automation methodology by involving employees in the process.
4. To assess whether the newly introduced automated system can reduce the cost and time leading to enhanced efficiency.

Key Issues

1. Resistance of the employees for a change to automation.
2. Time limitation (as the project is completed within 9 months) with the available Manpower.
3. Financial resources to include all the possible budgeted future expenses and also to determine number of system users which may drastically affect the cost of the project.
4. Appointment of the core team members for the project identified from the top management. The team requires a coordinator, convenor and team members having technical skill sets and knowledge.
5. A Setup for providing remote access via Electronic Data Management System (EDMS).

4. The teaching strategy

The Flow of teaching could be in the following order:



Before starting the case, a faculty may ask questions like:

- What will be your response to any major change like shifting to a new place for pursuing your dreams?
- How important is it to embrace the electronic database management system in terms of the future advancement of the company?
- Now, if an organisation has to go through both the situations as referred to in the previous two questions, what factors do you think the organisation should take into consideration?

Friends, previously we used to make our financial transactions by knocking at the door of the banks but now we can proceed to our gadgets with just one click. We now shop online after comparing the prices, discounts, product assurance and return policy easily.

- What do you think, which one is the major player behind this?
- Do you think technology can play an important role while serving the effects and efficiency of the organization?

So, let us move to learn about one of such cases. Today we are going to discuss-

Then the narration of the case will be done in story telling form.

Discussion on Case Gap

1. Other factors (Expansion strategy, demand analysis, etc.) contribute to the exponential growth of the organization apart from the technological aspect.
2. Dependency of the organization on the field data in terms of the primary data for the ERP system.
3. Effects on the distribution channel arise out of the relocation of the organisational HO from Rajasthan to Haryana.

Hence, we may conclude that for sustaining any competitive advantage an organisation should embrace technological up-gradation. At the same time, due importance should be given to maintaining a clear channel of communication to avoid any confusion or insecurity in the minds of employees. If the efficiency of an organisation grows, the organisation will grow along with its employees.

Key Takeaways

1. Futuristic approach of organization for adoption of technology with changing time.
2. The Company's story also emphasizes a major success factor – participative management, good teamwork, increased efficiency, availability of data.
3. Resistance of employees towards the change can be managed through transparent communication channels, proper counselling and motivation.
4. ERP Implementation in Shri Radhey Pesticide was completed within 9months.

Questions for Discussion

1. How did Shri Radhey Pesticides complete its implementation in a short time?

Today having ERP is not a luxury, but a necessity. Having a properly implemented ERP system and a fully trained workforce that knows how to use the system in the best possible way is a must to survive in this brutally competitive world. Shri Radhey has to identify the consulting firm that possesses all attributes necessary to conduct the implementation of ERP successfully. An ERP project consists of a group of people, the company employees, the implementation consultants, packages vendors, the hardware vendors, the communication experts and so on. The success of Shri Radhe pesticides depends on the employees playing their role depending on the company's level of complexity, installation procedures and

customization features which was much needed and followed by Shri Radhey Pesticides.

2. From this case, draw on the key factors responsible for the success of the implementation?

The most important and critical activity the company management is to do is to designate the right people to lead the project. Shri Radhey Pesticides was able to acquire a reasonable degree of knowledge about the ERP. It was able to motivate its employees to change and learn new Technologies and also had prepared them to assume their new responsibilities. Shri Radhey pesticides, in short, created an environment where the ERP system can grow, thrive and produce the benefits. The company was able to create awareness among the employees and bring out benefits like improved efficiency and improved decision making and faster response time to customer queries.

3. What competitive advantage would Shri Radhey Pesticides have in the early Implementation of ERP?

The competitive advantage of Shri Radhey Pesticides was information integration for better decision, faster response time to customer queriesand indirect benefits include better corporate, improved customer goodwill, customer satisfaction and so on. The other benefits of an ERP system are business integration, flexibility, better analysis and planning capabilities and the use of the latest technology.

4. What was the response of the employees in accepting the new system into the company and how did they overcome it?

Big bang adoption is the type of the adoption of the instant changeover when everybody associated with the new system at Shri Radhey Pesticide moves to the fully functioning new system on a given date. It was also moving to Gurgaon and switching from the old system to a new system. ERP was implemented in sales, production, finance and accounting, planning system, warehouse management, Human Resource planning department.

The company decided and christened 'TEAM ASSET' for achieving Success through ERP enabled Transformation. Also another parallel activity called 'change management' was initiated within the company. The prime objective of 'change management' was to reach out to people involved indirectly in the project to apprise them of the developments taking place. The company knew very well that they

had a tough time especially implementing the system in one stroke. They had to choose the period set for implementation seemed to be another major challenge. The time granted for the process was 9 months for the ERP system to ensure that it meets the demands. The company took all efforts to ensure that the change did not produce any sort of resentment in the organization. This was done by educating everyone on the need and desirability of change. The company adopted an ERP system to take lead in the competitive pesticide industry and through constant learning, innovation and refinement of its business operations.

Background Reading

Book

1. Stephen Harwood (2017), ERP: The Implementation Cycle, Butterworth Heinemann Publication.

Articles

1. Chofreh, A.G. et al. (2011). Enterprise Resource Planning (ERP) Implementation Process: Project Management Perspective. *Advanced Materials Research*, 338, 152-155.
2. Deshmukh, Prashant D., Thampi, G.T., Kalamkar, V.R. (2015). Investigation of Quality Benefits of ERP Implementation in Indian SMEs. *Procedia Computer Science*, 49, 220-228. ISSN 1877-0509, <https://doi.org/10.1016/j.procs.2015.04.247>.

Experience of using the case

The case has been instrumental in helping the students of Business Studies to understand the concept of Change Management and Technological Advancement. This case could be solved by students inviting Group Discussions and Individual Brainstorming Sessions.

Case Study 04

Soaring Ambitions of White Enigma*

The Genesis

White Enigma Technology Services Company was incorporated as a private limited company in the year 2017 in Pune. Prior to this, the start-up was operating as a partnership company founded by three young computer science graduates, Asit Patel, Salman, and Vikash. They were studying in a leading college in Pune. The company had a very interesting origin. It was born out of an idea that was part of a college competition to develop a website. The students' Professor encouraged the three second-year students of the MCA program to commercialize their idea and the proceeds from this commercialization were split in the ratio of 70:30 between the college and the team members. The commercialization of their idea led the three middle-class boys to dream big to start their venture.

While still at college the trio - all first-generation entrepreneurs, encouraged by their Professors - started designing websites and web applications for companies in their vicinity, usually through contacts and references. Interestingly, when they received their first cheque, they were not able to deposit the cheque as they didn't have any bank account (Current Account). Many Banks refused to open their account as they had no references. However, "*Janta Sarkari Bank*", a local bank accepted their request to open a commercial bank account though they subsequently opened their current account with Axis Bank. On June 6, 2010, the trio registered their partnership firm White Enigma, while still at college and also hired their first employee and thus began the trio's entrepreneurial journey. They also completed their final year project work from their own company, an essential requirement to earn their post-graduate degree.

Though they set up the company, they were not sure about its success and so explored the option of taking up a job and accordingly participated in the college's placement drive in their final year and Asit Patel, the CEO designate even worked for 8 days

* This case was developed by S Krishna Soujanya (Aditya Global Business School, Surampalem), Aparajitha Sanyal (Globsyn Business School, Kolkata), and Neela Gollapudi (Kasturba Gandhi College for Women, Secunderabad) during the Online Case Writing Workshop organized by the Association of Indian Management Schools (AIMS) from April 21-23, 2021.

before plunging wholeheartedly into the new venture. Participating in the college placement drive was a backup plan in case their venture failed.

The current CEO of the company Asit Patel and Ganesh Nanavare are the present promoters of the firm. They didn't have clear vision those days. While discussing the initial business plan, Asit said, "Multiple items, nothing was really plain enough." They knew that to bear the rent of the flat continuous projects would be required. So, they started working hard, even on holidays also. They learned to manage time efficiently between college and work. Having no familial responsibilities, no financial constraints, and having strong family support proved a blessing to these students.

Asit Patel is a first-generation entrepreneur with his grandparents into farming and father into Government Service. Since his childhood, he dreamt of doing something on his own but was not clear what it was. He was a keen observer and keeps himself updated with the latest technologies. He pursued hobbies like Rock climbing, Running Marathons, Trekking, and Reading Books. He also keeps himself busy planting saplings for de-stressing himself. Though Asit was technically very sound, he realized that for running a business it is better to be equipped with a Management Degree. Hence, after completion of MCA, he enrolled himself for MBA in 2012. His MBA helped him to understand the financial structure of the firm.

Firming up

The three decided that they would turn entrepreneurs and register their company. The first step required them to come up with a trading name for their firm. They toyed with many names but could not settle on any one name for their company. One day, Asit, one of the promoters working at his desk casually glanced at the white-coloured pen drive lying next to his computer and decided on White Enigma as the trade name of the firm. It was unanimously agreed upon as the colour white evokes a sense of quietness and concentration, a feeling of safety, and also signifies innocence, purity, and freshness. The promoters felt that this name would reflect the company's philosophy to offer quality services to their clients.

On June 6, 2010, they registered their partnership firm 'White Enigma' with four partners... three of the partners being postgraduates in computer science and the fourth, Ganesh Nanavare an MBA with marketing specialization to look after business development. In the first year of inception, one of the partners, Salman left White Enigma and joined the job. Subsequently, Vikash also left the firm and started an automation company but closed it and joined a company in 2013-14.

Product offerings and client acquisition

During 2012, there were a lot of “stand-alone applications” in the market. These are those types of software that don’t require any internet connection. Initially, the company was more into building these types of offline software. But the challenges were that it was difficult to give support for it. They discerned that offline software business would not have much of a future unlike online software, the changes couldn’t be done from the server. The clients expected a person to be available for resolving their problems. So, the cost involved was much higher. Soon the two understood that these types of offline business would not have much growth in the future and it couldn’t be their “cup of tea”.

“When JIO entered the market, we understood how much we were correct,” Asit smiled.

They realized their core competency and moved into web applications from website development. Any application would be using the internet in the future. They found it difficult to give support to their clients online and more manpower would be involved; hence they discarded few sectors. Soon they initiated mobile development app also.

Hiring practices and setting up of office

In the initial days, few of their classmates worked for them as software developers. Because of the company’s work culture, the employees could focus on their creative side. Initially, the interns joined at a stipend of INR 3,000/-, soon it was INR 5,000/-, and then 7,000/-. Now some of those interns have become full-time employees of the company and earning INR 60,000/- per month. If any employees wanted to leave the firm even in the middle of the project, the company let them go because they believed it would not be any difficult for them to get a new one. The company used to get lots of intellectual capital because of its location in Pune. The interns and employees were happy to join White Enigma as they had the opportunity to learn backend issues, frontend issues, freedom to discuss architecture and technology and also address customers in close quarters and solve their problems.

This company gave them a lot of opportunities to learn and after learning the employees left the company. They were using White Enigma as a launch-pad for their careers. For training, White Enigma is used to purchase online training programs. New employees were given practice projects, which are not live. When they got ready, they were shifted to live projects. Otherwise, they were moved to the company’s project

and trained internally. At the time they had their first international client with the UK, they lost their five employees but they were not deterred by the loss of talent. They knew that with rapidly changing technology employees in this sector are bound to leave.

Getting a Grip

Active marketing team

Although referral marketing and business networking were important strategies for White Enigma, they realised that in order to develop a long-term business model, they needed to focus on marketing and promotional campaigns as well. So soon they set up their marketing teams with five members. They have tele-callers also for cold calling. They also initiated email marketing. They started getting leads from them. They visited the client-side for the demonstration. Since 2018 they spent building a dedicated marketing team that does everything from tele-calling to cold calling to email marketing and lead generation. They have conducted promotions through references, used websites, and other portals. They offered bonuses and incentives to the Marketing team. They were careful in choosing their clients. They would choose those companies which were on the growth trajectory. White Enigma also wanted to grow along with their clients. As the client improved his base so would White Enigma also.

For the domestic market, they had started to take projects from only those companies whose business has strong financial back-ups. They understood it is better to have few quality customers rather than a lot of customers. Some of their clients like – “*New Flex Talent*” which was initially called “*Mobi Sutra*” had grown with them. Initially, for those clients they had developed simple websites, now they are working on their web applications. For “*New Flex Talent*”, the company has developed mobile applications. Around 10,000+ students have taken the test on those mobile applications. In the international market, they have already served in 10-15 countries like-UK, USA, Germany, Italy, etc. Presently they have a contract with a Germany Client. The company has assigned a dedicated resource for that client, who handles marketing for Germany. Two of their employees were also sent to Italy. For the international market, quality is one of the major components and clients are so technically strong, that it is easier for the company to handle them. These clients are most focused on the trust factor. Unlike Indian customers, it is easier to brief them on the requirement of technical changes or other changes in the project. They do not compromise on quality. They have certain parameters to be fulfilled. Indian clients need to be educated first and also need to be

explained regarding the pricing structure. The business aspired to be the first preference of its current clients.

Product development and R & D

They have a list of ideas which they start working on, invest a few months on several products simultaneously. It takes six to seven months for a new product to be developed and two months for test marketing. They take one year from idea generation to product launch. They have witnessed product failures too because of faulty marketing or bad financial management. They operate in the B2B Space. They also created websites for non-profit organizations and offer maintenance services. In the first year, they charged fees from NGOs. The company didn't charge from the 2nd year if the NGO is in the genuine business. They would keep a track of the non-profit organizations they are working with. If they are satisfied, they would offer free AMC for them. It is their way of serving society. The company has the vision to work on CSR activity in the future.

The wheel of the company started rotating along with time. They also started getting revenue from maintenance. They had monthly projects and started some 3rd party collaboration also. They had launched some products also in the market. The products were designed in combination with services. They started getting good earnings from those products. They took 5-6 months to develop the products and 1-2 months to run test marketing.

Pricing

In the embryonic stages of their business, they had no experience in pricing their services or products. They priced as per the customer's affordability. With their expertise, the company started quoting reasonable prices from the clients. They started using the Mark-up pricing method. Initially, they didn't know how to estimate a project. Depending on the financial strengths of the clients the company used to quote the price. They quickly realised, however, that this business was not going as expected. They understood that they have to calculate their expenses also. Later they implemented ABC costing (Activity Based Costing). So, they started calculating how many hours to devote to run the project. They understood how much energy and time to be invested in a client.

Later when they realized that they were unable to make profits with the existing pricing model of affordability of working for the customer, they reworked their pricing strategy to charge customers based on man-hours spent on developing the software solution. They know that if they want to survive in the market of competition, they

need to have a good pricing strategy. They also have few other pricing methods like monthly basis and fixed emolument per projects. They had other streams of revenue-generating from maintenance projects, products, projects with their ideas, and collaboration with partners. As customer acquisition costs are high in this highly competitive industry, generating revenues from existing customers helped White Enigma grow and generate repeat business. A symbiotic relationship existed between their business and the client's business. They could retain their customers through efficient data capture and record keeping.

In the initial years, they lost all the money earned on one project on the other five to six projects. Once they realized their overheads and expenses were growing the fun part was lost and the financial pressure was building up. Asit had to learn to manage finances effectively. In the beginning, they had low rents, and as they grew they had learned to charge heavily. With the help of a few clients and their own ideas, Asit was able to build a portfolio that could be introduced to potential clients. As a result, Asit and his team were able to stem the tide of early hiccups by employing a number of tactics that proved to be beneficial to the business.

Wary of Investments

In the initial phases of the company, the promoters were very financially conservative and did not want any outside investment as they felt that an outsider might disturb the organizational culture of innovation and freedom. The company's organizational culture was essentially built on relationships. The clients were often seen as partners in progress rather than those who gave the business to the company. The company turned down an offer from an overseas investor for this very reason. In addition, they also managed their finances prudently and did not raise any loans from banks or any other sources. They haven't taken any support from any of the Government policies till now. In the initial years, they did not require any investment. As they grew, they realized that if they approach others for the investment, they would lose the freedom to operate. A decade of experience in business taught them that investment is essential for their growth. From hiring 1 employee they reached 25 employees. They have built 500 websites till now.

Growth ambitions

The company which was started with minimum financial investment is now looking to grow to a 5-crore annual turnover company in the next two to three years from the current 1.25 crores. Now that the company has stabilised, it is now actively seeking investors. The promoters are more confident about their abilities now and are looking

for investors who share their values and vision for the company. The Pandemic too played a part in this ambition. It helped make the company a pan India company. It also taught some tough business lessons to the promoters as they lost some clients in the travel and tourism industry.

During the Covid pandemic, they launched new web applications for educational institutions. White Enigma also launched artificial intelligence-based tools for monitoring examinations. They devised applications that could help educational institutions understand their present position in a few Academic Rankings. The online market has seen a rise and they expanded to geographies which they earlier did not and could not address. Because of the pandemic, they have lost their clients in their "Travel & Tourism" sections. For a Maldives client, the company had built a portal through which the agents used to book hotels or resorts. But pandemic had stopped that work. The clients who were in this sector lost heavily and it impacted the White Enigma to some extent.

On the other hand, because of the pandemic, they have started getting orders from all over the country. They leveraged the online platform like Zoom to organize webinars during the lockdown period. Now through zoom, they are demonstrating their products. They are in the process of filing patents and are working on a few Breakthrough ideas. Asit Patel was pondering over their new projects and the patents to be filed while focusing on AI, Blockchain, and Machine learning. In the next three years, they have a vision for reaching 5 crore turnover.

"White Enigma Technology Services Company" has always desired to stand out. However, there were already a lot of freelancers and agencies in the sector where they were working. Asit was clear that in order to expand the business in near future, they need to have a huge amount of investment. He was thinking about how much investment to seek, whom to whether to approach a VC. His desire to be in this field initially was due to the scope the sector offers, the growth opportunities, less investment required, or sometimes no investment). After a decade they had to think to scale up and were keen on approaching investors. White Enigma company is now getting ready to stretch its wings and soar into the sky and is now set to fly high.

Questions for Discussion

1. Do you think given the mindset of Asit and his partners, the company can become a force in the competitive technology service space
2. Discuss the start-up ecosystem in India

3. What measures should the White Enigma take up to strengthen their marketing efforts?
4. What investment should White Enigma pursue to leapfrog from a small enterprise to a medium enterprise? (Private Equity, Venture Capital, IPO, Merger with a bigger company)

Teaching Note

Soaring Ambitions of White Enigma

Synopsis of the case

White Enigma technology services were incorporated as a private limited company in the year 2017 in Pune. Before this, the start-up was operating as a partnership company established by three young computer science graduates from a leading college in Pune. They realized their core competency and moved into web applications from website development. They discerned that offline software business would not have much of a future. The interns and employees were happy to join the White Enigma as they had the opportunity to learn backend, frontend, freedom to discuss architecture and technology, and also addressing customers in close quarters and solving their problems. They used to go for all the projects, without understanding the financial strength of the clients. Initially they didn't know how to estimate a project. Depending on the financial strengths of the clients the company used to quote the price. The company which started with minimum financial investment is now looking to grow to become a 5-crore annual turnover company in the next two to three years from the current 1.25 crores. The company is actively seeking investors now that it has stabilized. The promoters are more confident about their abilities now and are looking for investors who share their values and vision for the company.

Target learning group

Undergraduate and Postgraduate Students, for Executive Programs and Entrepreneurship Development Training Programs

Learning/teaching objectives and key issues

- Identifying the personality traits of an Entrepreneur as opposed to a Manager
- Understand the challenges involved in a student Start-Up
- Learning the pricing methodology for a start-up and the importance of budgeting

- Understanding the significance of various marketing tools, e.g-email marketing, referral marketing, WOM marketing, etc.
- Understand the consumer behaviour in services

Teaching strategy

A. Trigger question

1. If you were given 500 rupees and asked to sell and make profits, what would you prefer to sell on our campus?

B. Group Task

1. SWOT analysis-Individual Task
2. Group Task -Business plan

Questions

1. How would you retain talent in a start-up company?
2. If you are the promoters of the company how different would you act, what kind of growth plans would you undertake, and why?

Analysis of data

The case does not offer data for quantitative analysis.

Background Reading

1. Rashmi Bansal's Book Arise, Awake
2. Entrepreneurship. Robert D. Hisrich, Mathew J Manimala, Michael P.Peters, Dean A Shepherd
3. Read about iconic companies like Apple and Facebook
4. Watch the movie Pad man

Experience of using the case

This is a new case.

Case Study 05

Decision Making under Uncertainty*

Everest Limited is a globally diversified natural resources company with interests in Power, Lead, Zinc, Iron Ore, Aluminium, Silver, Steel, Copper, Oil and gas. The company directly employs over 60,000 people. It has contributed US\$ 6 billion to host governments through direct and indirect taxes and royalties. The company invested over US\$ 17million in community development initiatives.

Everest acquired management control of Northern Steel limited (NSL) in 2018. NSL Group was founded in the year 1960. NSL is an associated company of AMZ Steel Casting Ltd., to strengthen India's infrastructure. AMZ Steel Castings Limited has ventured into the Steel manufacturing industry through NSL. It has set up a capacity of 2.44 million ton per annum Orangefield Integrated Steel plant, in the Jharkhand. Orangefield Integrated Steel consists of a Coke Oven, Blast Furnace, Sinter Plant, Billet Caster, Wire Rod Mill, Bar Mill, Basic Oxygen Furnace, and Power Plant. NSL has set up a state of the art production facility with the help of international expertise and solutions from renowned manufactures.

Ramesh, the Head of Industrial Relations, is worried about the impact of the Covid-19 pandemic. The Coronavirus pandemic has not just affected lives in Jharkhand but also disturbed manufacturing at the plant. The lockdown that followed brought the manufacturing facilities of NSL to a standstill, derailing the entire supply chain. He was facing a decision that about 1,600 contractual labours have to be retrenched. Presently, the company has 4,500 contractual labours managed by the contractors which also include labours who gave their land for plant setup. Employment opportunities in the area were already scarce and unemployment levels high. When Everest took control of the NSL management in 2018, Ramesh was given a target to reduce the contractual labours by 20%. He carried out a study for 6 months to identify the areas to downsize the contractual labours but found that there is no immediate need to retrench the labours. Also, the company had ensured job security to the labours who gave their land to the company for plant setup.

* This case was developed by Makarand Wath, Prashant Deshmukh (G.H. Raison Institute of Business Management, Jalgaon) and Vani Harpanahalli (St. Joseph's Degree and PG College, Hyderabad) during the Online Case Writing Workshop organized by the Association of Indian Management Schools (AIMS) from April 21-23, 2021.

Ramesh felt that the Covid-19 pandemic is the right time to downsize the labours as management is worried about the survival of the company. There are not enough orders to keep manufacturing facilities running. Luckily, the company has got a huge order from China to keep the steel plant running.

The next concern of Ramesh is to keep the plant operational as per the strict Covid-19 guidelines of the local government. The guidelines include salary protection to labours, encourage labours to stay home if they are sick, practice sensible social distancing and maintain six feet between co-workers, promote personal hygiene. If labours do not have access to soap and water for hand washing, provide alcohol-based hand rubs containing alcohol and provide disinfectants and disposable workers can use to clean work surfaces, etc.

As per the guidelines, the plant needs to operate with 30 percent capacity. The company allowed only 30 percent of labours in the plant. The management decided to retrench 1,500 contractual labours. This news spread among the workers. As there was no trade union in the company, the labours gathered together to resist the decision of the management and they tried to enter inside the plant. The local workers who gave their land for the plant reminded Ramesh about the assurance of job security. Also, 156 labours were infected by Covid-19. At the same time, the local government asked to step up a Covid-19 quarantine centre in the plant. Due to the Covid-19 pandemic, Ramesh got a chance to downsize the labour force but on the other hand, he is worried about the current situation and completion of order from the Chain.

Ramesh wants to protect the contractual labours and maintain productivity to complete the order. At the same time, the local government was compelled to set up a Covid-19 quarantine centre with all the facilities. This posed a threat to the health of the workforce and the potential to affect production. He is apprehensive about the outcome of the situation.

Questions for Discussion

1. Identify the issues involved in this case.
2. What would you do, as Ramesh?

Teaching Note

Decision Making under Uncertainty

Case synopsis

Ramesh, the Head of Industrial Relations, is worried about the impact of the Covid-19 pandemic. He was facing a decision that about 1,600 contractual labours have to be retrenched. Presently, the company has 4,500 contractual labours managed by the contractors. Employment opportunities in the area were already scarce and unemployment levels high. Ramesh wants to protect the contractual labours and keep the plant operating at the same time

Keywords: Decision making, decision making under uncertainty.

The target learning group

Post Graduate Management students, Management of private manufacturing units.

Learning and Teaching Objective and Key issues

- Develop a deeper understanding of Decision making
- To understand decision making under uncertainty
- Develop responses to different decision making issues

Teaching Strategy

1. Trigger question that can be asked to open the Case

What is decision making?

2. **Group Task**

Divide the class into groups and give each group the task of identifying the course of actions to overcome the issues.

3. **Debate and Discussion**

- Discuss the various issues faced by Ramesh
- Discuss steps involved to overcome these issues.

Questions

- Identify the issues involved in the case.
- What would you do, as Ramesh?

Background Reading

Concept of Decision making, decision making under uncertainty, steps involved in decision making.

Case Study 06

Technocrat to Entrepreneur: An Inspiring Journey*

Introduction

Education plays a very important role in growth and development of any nation. Apart from inculcating moral values and knowledge, another major aim of education is to make student employment ready. Many a times students are not industry ready and are not aware of set of skills and aptitudes required by corporate as their curriculum is not linked with required skills and trainings. Industries and organizations have often had to bear huge cost to make hired employee to be industry ready. Moreover, the current model of imparting education is also limited to classroom learning at various fronts.

PGK Technologies tries to fill this gap and act as a bridge between human resources that are prospective employees, universities and employers by trying to launch India's first Blockchain based collaborative Campus Hiring platform. The model offered by PGK Technologies gives hands on experience and expertise to the students throughout the learning process. The services provided by the organization are of great importance in making our future generation employment and industry ready. The leading driving force in Ramesh's journey is the zeal to fill the gap observed in:

- a) Industry and corporate readiness of students.
- b) Industry and Universities - academic institution needs course overhauling to draft in a way that inclusion shall be made to meet the corporate requirements. The curriculum in many universities is very outdated and doesn't cater to practical applications' part and skills which students might need when he seeks for emerging employment opportunities.

* This case was developed by Ruchi Singh (Prin. L. N. Welingkar Institute of Management Development and Research, Bengaluru) and Kiranmayi Patel (Siva Sivani Institute of Management, Hyderabad) during the Online Case Writing Workshop organized by the Association of Indian Management Schools (AIMS) from April 21– 23, 2021.

Blockchain based campus hiring platform works as collaborator and offers platform where all stakeholders such as students, corporate, universities, learning platforms and assessment platform are on board to interact in a seamless fashion. The platform provides required transparency and are on board to interact in a seamless fashion. The platform provides required transparency and visibility into Employers' hiring and skill needs and thereby helping all the stakeholders of the platform. This connects helps students to learn and impart skill sets required by corporate to become Industry ready by subscribing to new courses by the learning platforms. Corporates can benefit in reducing induction, training and on boarding cost and can have access to students, which are Industry ready from day one, which is, win-win situation for all the stakeholders of the platform.

Profile of the organization

PGK is a technology company that specializes in the area of Blockchain Technology. PGK means "Persistently Growing Knowledgeable and Innovation solutions". The Motto of PGK Technologies is to provide future-proof products, solutions to help organizations and institutions to maximize the potential of their existing systems and resources. The spectrum of services is vast and varied – building products, establishing Centres of Excellence in Blockchain technology for universities and organizations.

The company is founded by Ramesh Pisupati and T Rajanikanth in the year 2020 to bridge the skills gap observed in the education domain and also groom skills primarily in Blockchain technology. The Leadership team of Ramesh and Raj, comes with more than 25 years of experience in the world of Information and Technology. They have worked in leadership roles for top Multinational corporations like Infosys, General Electric, E&Y, Capgemini, Pwc, Tech Mahindra, Genpact, etc. They have experience of working across multiple verticals like - energy, infra, finance, retail, healthcare, and IT to name a few. They have experience and expertise in:

- a) In incubating large technology and management and application oriented COEs for niche technologies
- b) In handling large IT & Non-IT transformational programs and initiatives across government and private sectors
- c) In developing COE methodologies, processes, tools and techniques
- d) In running education and training programs in the corporate world servicing large customers
- e) In running large student education programs and corporate induction programs

Both Ramesh and Raj are certified Blockchain Architects and accredited and are also the members of world renowned organizations and global communities like Blockchain Council, SAFE 4, Scrum Alliance and PMI, etc. They have experience in successful delivery of large transformational programs using Waterfall and Agile/ Scrum methods.

PGK is planning to provide its services to Indian educational sector in Blockchain. The uniqueness or what can be mentioned as USP of PGK Technologies is the way they are imparting skills and training to prospective students to make them job ready from day one when corporates deploy them. They impart skills and training in emerging technologies like Blockchain, AI and IoT to keep students at par with the requirements of corporate once they finally go for employment opportunities and placements.

Inception story of the company

When asked Ramesh about how the idea of such venture came at very first place, Ramesh mentioned that after gaining experience in working with big corporates, we have always been wanted to start our own and 2020 was the year the journey of entrepreneur started for both Raj and me. Though the thought process and planning started in 2019 it took almost a year for us to freeze on products, scope of services and most importantly the foundation technology Blockchain. We were always striving for differentiation in almost everything right from technology to the product and services. We finalized on the following three aspects there where we found differentiation:

- a) Product – Campus hiring which would bridge the gaps in Campus hiring
- b) Technology – Block chain has many advantages – immutability, security, it's distributed and Peer-peer model will help and transform the world in near future and help the company in building products on niche technology.
- c) Services – COE based capability building in Blockchain within student community help corporates in hiring candidates in Blockchain technology but also getting industry ready in terms of having candidates with awareness about 6-sigma, project development methodology and coding and quality standards.

Finally, the family and friends supported the idea and many leads started coming up. While giving thought to the process different sources have played very crucial role in inception of PGK Technologies.

Core Values

Every organization has some set of core values which the organization and its functioning should adhere to. Core values play a very important role and often reflect the way any organization is looked up at. PGK Technologies is also not an exception. The company is customer centric and focus is laid on meeting the needs of customers. Quality assurance is another core value for which PGK Technologies never compromises upon and adherence to commitment and delivery.

The Entrepreneur and Technocrat

Recognized for taking risks and driving results while learning from failures has been key in keeping Ramesh motivated all through. With diversified background and over 25 years of IT experience -Ramesh started his career as a Scientist/Engineer with Indian Space Research Organization (ISRO) way back in 1993 and over the years worked with MNCs, global technology and consulting firms like Infosys Limited, General Electric, Ernst & Young LLP, Wipro Systems, Intelligroup Inc and Genpact.

After successfully donning diversified leadership roles over last 15 years - as a Program Manager handled large global transformational programs, as a Customer Account Manager with P&L responsibility, as a Practice head handled large practices involving Oracle and SAP technologies, as a Competency Leader in incubating niche technologies and Centres of Excellence, Quality leader in driving 6-Sigma, CMM initiatives, AMS head in setting up customer GDC and responsible for large support portfolio. He always has honed his leadership skills through continuous learning. Distinguished for an entrepreneurial mind-set, creative problem solving, cross functional and global teams and a top/bottom-line orientation and finally, after having learnt so much, over these years Ramesh decided to end his IT journey working with other IT organizations and embarked this journey as the Founder and CEO of PGK Technologies Private Limited.

Being a technocrat, his fascination towards keeping abreast of technologies always grown— more so in newer dimensions of Foundation and disruptive technologies like Blockchain, AI & IOT. His interests have grown multi-fold in Blockchain as he started getting in-depth insights about how organizations can benefit out of its scalability, security, immutability and P-2-P features, Blockchain has become a natural choice of technology for PGK Technologies to harness its power.

The Early Challenges and Major Milestones

Like any other venture, PGK Technologies too has gone through various challenges and bottlenecks. Few challenges faced by Ramesh are in finalizing:

- a) Scope of services which provides them required differentiation and uniqueness
- b) Choosing business domain and identifying the right business problem to be solved. "Solving that problem must have big impact both socially and economically" as quoted by Ramesh.
- c) Robust marketing strategy, which provides scale and market, reach of the services offered by PGK Technologies. The services should reach both organized and unorganized sectors. Ramesh says "Putting up a) concept in prototype and b) pilot to community adoption is a huge challenge".
- d) Challenges related to CSR, i.e., how services can contribute and can give back to society is another one.
- e) Legal protection and security such as Intellectual property rights and copyrights were to be taken care beforehand to ensure the uniqueness of the product.
- f) Building sound financial strategy, which is both short and long terms say 5 years.

Within this short span of time of nine months, Ramesh is pleased with the way PGK Technologies has shaped up so far.

Customer Segmentation and Services

Product is a mix of education and industry and tries to cater set of requirements an industry looks for while hiring them on board. Centres of Excellence (COE) are one of the major services offered by PGK Technologies. When asked does PGK Technologies have any plans to reach to students directly either for the product launch or for COE services, Ramesh clearly mentioned approaching universities - talent and placement officers, department heads, learning and assessment platforms.

About Blockchain COE services

The process through which students are trained to meet corporate requirements, PGK Technologies offers almost one-year training on Block chain. This training normally runs into 2 phases – First phase is more about block chain theory with limited practical labs and phase 2 covers practical and prototype/use of case development. Students are facilitated to develop prototype based on the leanings acquired in phase 1 and for

remaining months they are linked with industry mentors to work with to gain better insights and leanings on Blockchain and building a product. At the end of the program the students are mentored and assisted on developing presentations to corporates. Thus the basic pedagogy of almost yearlong program is to have hands on experience along with theoretical and conceptual understanding. The cost for the entire process is catalog based and depends on how penetration the customer wants in terms of service offerings. Six Sigma method is followed in pedagogy to ensure quality of the service.

Strategies and Approach Adopted by PGK Technologies

Strategies adopted by any organization speak volumes about the ethics, values and process of the organization. Various strategies have been mentioned below:

Leadership strategy

Ramesh is very particular about leadership strategy and varies his' strategy based on the people involved, milestones and targets. He feels that successful leader is one who gets into details in various dimensions. Most often adopted strategy is tailor made strategy and what strategy to be adopted depends on what audience company is dealing with.

Marketing strategy

The long-term goal of PGK technologies is to penetrate into and tap both organized and unorganized sectors pan India. In unorganized sectors, skills impartation often directs via middlemen and PGK Technologies aims to smoothen the learning process and makes its seamless even for untapped unorganized sector as well.

Financial strategy

Finances are of prime importance in sustenance of any organization. PGK had garnered some bootstrap investments as of now and would be going for angel and VC investments for medium and long term financial sustenance and growth.

Road ahead

PGK Technologies is at initial stage of its journey. PGK Technologies is very confident about their approach and strategies and expect revenue profit of 175% by fifth year of establishment.

Success Mantra for youngsters who aspire to become Entrepreneurs

In Ramesh's own words "Be passionate about whatever you aspire to do. Passion will drive you to your goal. To become a successful entrepreneur

- a) Identify a business problem, which has market acceptability and readiness. In addition, the business problem should have the scale
- b) Do extensive ground work, good amount of market analysis to understand the scale of the solution
- c) Define a 360 degree and robust business strategy and finally,
- d) don't feel shy in approaching industry experts and SMEs time-time to do periodic validation"

Questions for Discussion

1. Comment on leadership style of Ramesh. Do you think this is an appropriate style for all situations?
2. Draw up SWOT Analysis for PGK Technologies.
3. Suggest a business development strategy for PGK Technologies.
4. What strategies would you suggest for the competitive advantage and sustainability of PGK Technologies.

Teaching Note

Technocrat to Entrepreneur: An Inspiring Journey

The case was developed from the material gathered during interview with the Director of the company. The case has approval of the organization for publication in original name.

The synopsis

Technocrat to Entrepreneur: An Inspiring Journey of Ramesh. The case is a story of an Indian Start-up to fill the industry academia gap. This case demonstrates the various entrepreneurial qualities of the protagonist, like entrepreneurial mind-set, creative problem solving, cross functional and global teams and a top/bottom-line orientation, risk taking, flexibility, networking, passion and hard work situations, events and

practices leading to the inception of the company. It focuses on Leadership, Technology, Marketing, Quality and financial strategies which were followed before inception of the company. PGK Technologies trying to achieve notable success and attract attention within the country.

The target learning group

The target learning group for this case study is undergraduates and postgraduates who are pursuing courses on management or entrepreneurship.

The learning/teaching objectives

The objective of the case is to make students understand how an idea can be converted into a real time product by constantly thinking over it.

The readers would also learn

How the qualities such as entrepreneurial mind-set, creative problem solving, cross functional expertise, risk taking, a multi-tasking helped him to nurture talent and imbibe leadership traits by inculcating core humane values. Develop relationships with all stakeholders for seamless performance. Understand various strategies employed by start-ups.

Teaching Strategy

The case can be used in the introductory classes of entrepreneurship to help motivate students and appreciate the conversion of idea into a real time product create a brand/reputation.

How the qualities of Ramesh helped him to build a company out of his taught (ideas).

Use Triggering questions to help the students brainstorm and arrive at decisions about business development strategies, strategies for sustainability and combating competition.

Group Task

Divide the class into groups and give each group a task of applying a specific leadership style such as autocratic, participative, laissez faire and discuss what kind of outcomes are possible under each type of leadership style.

Analysis of data

The case does not offer data for quantitative analysis. However, there is sufficient data for Qualitative analysis and for using the tools and techniques like Concept Map and SWOT analysis.

Background Reading

Books

1. Start a Business, Grow a Business, Sell a Business by Stephen Hawley Martin
2. The \$100 Startup: Reinvent the Way You Make a Living, Do What You Love, and Create a New Future by Chris Guillebeau
3. The Entrepreneur Mind: 100 Essential Beliefs, Characteristics, and Habits of Elite Entrepreneurs by Kevin D Johnson
4. Cases in Entrepreneurship. Morse. E. A., Mitchell. R. K, Sage Publications
5. Entrepreneurship: New Venture Creation. David H. Hott by PHI.

Case Study 07

A Banker Who Went that Extra Mile*

Background

The term Non-Performing Assets (NPA) has a draconian perception not limited to the borrower in question but does extend to the Bank from where the relationship is maintained. When a business tycoon's name is appended in a publicized media trial and labeled a willful defaulter, the 'voice of the nation' embarks on the route to compare, contrast, and analyze Public and Private Sector Banks from a wider perspective. While appreciation is recorded for the services of Private Sector Banks (PSB), this case attempts to narrate the incidents faced by Ananth from a Public Sector Bank, 'Vision Bank Ltd (VBL)'. Ananth has evidenced that passion in a chosen field could be seamless without limitations and banking services be extended to the customer, *albeit* with due diligence, till the case is resolved. For brevity, VBL was established in 1975 and operates from ten PAN-India Regional Circles. On an administrative record, the Bank has sixteen Zones and 2,147 branches with 73 Unique Customer Service Branches.

Ananth, academically a Post Graduate and professionally a certified associate of the Indian Institute of Bankers (CAIIB), was staffed as a Middle Management Functionary with about three decades of a good service record. During his tenure, he has led Non Performing Assets (NPA management team), Retail Banking Group (Liabilities & Assets), Corporate Credit, MSME Credit, Export Financing, chaired Audit Committees, discharged key functions as the Secretariat-Credit Committees, Trade Operations, Audit, and Agriculture Sector Operations. Ananth was an officer with the vision and passion to extend the Bank's services to yield customer delight and always went the extra mile to serve the Bank's loyal customers.

* This case was developed by R. Anita (St. Joseph's Degree & PG College, Hyderabad), Veenapani (Sarojini Naidu Vanita Maha Vidyalaya, Hyderabad), Monali Sharma (G.H. Raisonni Institute of Business Management, Jalgaon) and V. S. M. Srinivas (MVGR College of Engineering (A) VZM, AP) during the Online Case Writing Workshop organized by the Association of Indian Management Schools (AIMS) from April 21-23, 2021.

Handling Customer Repayment Issues

It all began when Ananth was staffed at the Retail Management Centre, Delhi, India where his team received, processed, disbursed, and monitored loan portfolios secured by the immovable mortgage. One customer, Rajesh applied for a Home Loan and the Turn Around Time (TAT) was five working days as per the bank policy. However, the loan was put in abeyance given a difference of valuation between the Contractor, Rajesh, and the Bank's panel valuer. Given Rajesh's loyalty evidenced by an earlier business banking relationship with VBL, this would be the second asset relationship if the loan could be processed.

The next day, Ananth arranged a meeting at 6:00 PM in the Bank premises with the Panel Valuer, and the valuation of the property details was sorted out. At the same time, the Bank was hosting a Home Loan Workshop with emphasis on Insurance. Ananth advised and guided Rajesh to take the opportunity and explore various facets of the Home Loan. He took up the opportunity, and due to lack of funds, Rajesh opted out of insurance. He could afford only Rs.1,00,000/- as against a premium of Rs.1,50,000/-. In a short period, Ananth facilitated an express personal loan, given the strong repayment capacity of Rajesh's firm. Rajesh repaid the Personal Loan within 120 days from sanction.

Bank Merger and Customer Repayment Issue

In another instance, Ananth was promoted as a Middle Management functionary for the district of Madurai, Tamil Nadu, India. He addressed multiple challenges during his tenure at Madurai, and one such experience was with a customer named Sam Willows, who was a valued customer, and approached Ananth for an SME loan principal of two crores. After verifying the customer's profile Ananth disbursed the loan at a competitive coupon as compared to normal market rate. During the same period, in lieu of a Central Government Order, VBL was merged with another large PSB. Due to this merger, there was a delay in repayment of the loan by many Customers. Sam too was one of them. When questioned on the same, Sam replied that since the bank was not following up, he was not making a repayment. Ananth intervened and with constant perusal, the repayment issues were sorted out. Ananth opined that the banker's personal touch with each customer was very vital and can influence them positively. Post-mergers bring in a lot of resistance to change by employees and customers do not adapt to new standards and changes quickly, and prefer old standards.

Banker's Journey with trouble creating Customers

During Ananth's tenure in Nagpur, Maharashtra, India, a customer named Kishore borrowed a housing loan of Rs.75 Lakhs. Kishore failed to pay back any amount to the bank for more than six months. Ananth studied his case and decided to engage with Kishore, who operated a very lucrative business in Wardha, selling cashews, paintings, and other products which attracted a lot of tourists to his outlet. Kishore earned a large quantum of money and duly invested in real estate hoping for a Bull-run. In the interim, Bank staff had already initiated recovery proceedings for the outstanding debt and accrued interest receivable. Kishore was already issued an arrest warrant from the local Police Station. Without delay, Ananth met and convinced Kishore to deposit Post Dated Cheques as per Bank's policy and negotiated a redressal route.

The bank staff though had the intention to help Kishore personally, they couldn't do much, as services to a defaulting borrower were out of the banking purview. It was observed that in the last six months, one of the Post Dated Cheques of Kishore bounced, with this incident, Kishore was unhappy with the bank and decided to trouble the bank and its staff, by not paying the EMI, and the same continued. Kishore had another outlet in the city run by his spouse and the loan was borrowed in both their names. His shop was about five km away from his spouse's shop. 'VBL' sent a letter to both of them informing them that there was an overdue loan amount that had to be repaid immediately. Given a neglected response, Ananth and his reporting staff went personally to the customer and handed over the letter to him. This annoyed Kishore, who tore the letter into pieces and flared on Ananth in front of his subordinates. Almost all the subordinates were shocked by the behavior of Kishore. They expected their superior Ananth to take some action, to which Ananth replied, "Don't worry I have Plan B with me."

Ananth studied the background of Kishore and after analyzing the CIBIL score, noticed that although he defaulted the loan, his CIBIL score was impacted only partially. Armed with the new-found information, Ananth enquired if Kishore had some other loan facility with some other bank and in the process found that Kishore had taken a loan from another bank too. In Lieu of a 1st charge holding on the mortgaged property, Ananth met the respective bank's branch manager and asked him to send the letter for repayment. When the bank was not supportive, Ananth intimated the latter's bank manager to tag Kishore as a willful defaulter and after a lot of persuasion, the latter bank held up with the customer and asked Kishore to honor the cheque immediately. Taking the latter bank's advice seriously, Kishore along with his elder brother

immediately rushed to meet Ananth the next morning, apologized for his earlier behavior, and agreed to repay immediately. However, Kishor was against a Time Settlement (Compromise Transaction) as he may not get any loan in the future. The bank agreed and the amount was settled accordingly.

Based on the various customer issues faced by the bank, it was decided by the competent authority that in the future especially NPA accounts, drawing the CIBIL report was made mandatory. This was to understand the default behavior and track record of bounced payments post-sanction of the loan. This can assist the Bank to obtain the contact coordinates (Address & Mobile Number) of, especially absconding borrowers. Hence it was evidenced that the CIBIL report should be generated as and when the account becomes an NPA. The process of drawing the CIBIL report is done only at the time of the sanction. VBL since then has convened a high-level committee to deal with willful defaulters. The credit monitoring group was set up on Regional and Branch wise. Dispatch of multiple loan default notices vide ordinary (30 days default), registered notice (60 days default), and a Legal Notice (90 days notice) were to be sent from the central office (Branch/Regional/Zonal) and follow up to take necessary action to recover the overdue loans. With the passing years and increasing defaulters in the bank, the Government has held many committees and eventually has come with many corrective and preventive measures like:

- The Debt Recovery Tribunals (DRTs) – 1993.
- Credit Information Bureau – 2000.
- Lok Adalats – 2001.
- Compromise Settlement – 2001.
- SARFAESI Act – 2002.
- ARC (Asset Reconstruction Companies)
- Corporate Debt Restructuring – 2005.
- 5:25 rule – 2014.

And many more, yet the defaulter numbers were not shrinking for various reasons. The above laws are mostly on paper and had varied results. However, several decisions and routes which were taken by the banking staff went unmentioned, though they saw some success. Ananth in another case enquired about a customer's profile and did a SWOT analysis and recovered the loan which was in default for over four years, along with compound interest, as the nonpayer was a willful defaulter.

Willful Defaulter

During his tenure in Goa (India), Ananth had negotiated with a borrower named Ashok, who was operating a travel agency and a snacks parlor. Ashok was very reluctant in honoring repayment advice from the Bank and was evading for more than 48 months and was absconding. Ananth with his previous experience of such issues, assimilated the facts, and inquired in-depth about Ashok's profile. In the process, Ananth came across twelve addresses of Ashok to which the Bank dashed off letters. With this action, he could obtain access to his phone number through a CIBIL report. Without wasting time any further, Ananth called Ashok and intimated him of initiating recovery under section 138 of Negotiable Instruments Act 1881, (non-bailable cheque bounce proceedings) to which Ashok expressed regret and settled the loan immediately with compound interest as this was another case of willful default.

Official Liquidator

Ananth's banking experience is further illustrated in terms of ensuring that the borrower is hand-held to the last minute, the issue is resolved preferably as an out-of-court settlement. Ananth, in an official recovery head capacity, was to engage with the Official Liquidator (OL) wherein the interest of the Bank, his team liquidated the assets of a group of defaulter's amounting to approximately Rs.17 (Seventeen) Crores and routed the payables to six other banks, which as a consortium had extended the high-value credit facility. The OL had to follow a pro-rata basis in the settlement process, but was not delivering his responsibilities and was causing an unwanted delay for more than 24 months for disbursement of the sale proceeds to the participants of the syndicate. Ananth then insisted upon the council for recovery to file a legal suit claiming irresponsibility and causing delay leading to financial losses. The council then requested the Honorable Court (of financial disputes) to settle the liquidation.

The OL was following the instructions of the court but was inclined to pay only after the financial year-end. Ananth was expecting this move of OL and raised concern over late settlement already and quoted the historical loss in quantitative terms, and recorded that any additional delay could impact the banks' earnings and hence filed for a revision petition in the last week of March. Higher officials of the bank insisted upon Ananth not to exchange any conversation formally or informally with the OL, as this may trigger them to change their plans. On the day of the verdict when the Honorable Court asked the OL to pay all the six banks before the financial year ending, the OL and their legal counsel were shell shocked. Ultimately, it resulted in OL disbursing the sale proceeds to the consortium before 31st March of that year.

This is a “writing on the wall” that all recovery officers from any bank need to mandatorily be present in person before all proceedings in a court of law, viz, DRT, recovery officer DRT, Civil Courts, Local Courts, Special Benches, NCLT, and session courts along with the High Court and act as an “Advocate’s Advocate” and not completely rely on panel advocates.

Questions for Discussion

1. If you were in Ananth’s position how would you deal with the Debt recovery situations?
2. Can you identify the loopholes existing in the banking system through this case?
3. Keeping in mind customer satisfaction, what steps can be taken to improve it from a banker’s point of view?
4. Can you identify the traits of Ananth which made him resolve the customers’ issues?

Teaching Note

A Banker Who Went that Extra Mile

Synopsis of the case

Non-Performing Assets (NPA) in banks is a major problem in both Public and Private Banks. This case on “A Banker who went an extra Mile” focuses on how the banker resolved the various customer repayment issues/problems by making the customers understand and the way he rendered his support to them to settle their dues. The case deliberates on various incidents which the protagonist had faced during his tenure in Vision Bank at various branches, Pan India. While discussing the challenges faced by the Protagonist in making customers repay the loan amount, the series of incidents narrated introduces the different mindset of customers in repaying the loan. The Protagonist, Ananth has evidenced that passion in a chosen field could be seamless without limitations and banking services be extended to the customer, *albeit* with due diligence, till the case is resolved. This is a pivotal variable attested by the case study where Ananth recovered (Principal and Interest due) in several written-off cases and absconding borrowers across business verticals. This case study allows the participants to understand the loopholes of the banking system and the loosely formed procedures to handle the repayment issues. The case also makes the students/participants understand the importance of connecting with the customers for long-lasting

relationships and with a personal touch can lead to great benefit to the bank. The teaching note discusses and analyses the customer repayment issues and the process used to resolve them so that the Non-Performing Assets of the bank can be reduced.

The target learning group

This case can be discussed with Commerce and Management undergraduates, M.Com/MBA/PGDM Students, and Banking executives. This case can be used in the Banking, Customer Relationship Management, Management, and Organisational behavior and Marketing Management.

Learning/Teaching objectives

1. To understand who are willful defaulters
2. To study the process used to handle loan defaulters
3. To understand the concepts of Non-Performing assets, customer relationship management, and importance of Customer Service
4. To understand the managerial skills required for handling customers.

Key Issues

1. Tackling the loan defaulters/willful defaulters.
2. The right mechanism to be implemented to tackle any customer repayment issues.

The teaching strategy

- a. Students were asked to go through the banking sector reforms, various committees held responsible for reducing growing NPAs, and the guidelines of RBI to banks on handling Non-Performing Assets before the discussion of the case in the class.
- b. Before the actual classroom discussion, the students were encouraged to analyze all the questions given in the case individually to enable them to participate effectively and to enrich the learning outcomes.
- c. During the classroom discussion, initially, the class was divided into teams which were identified earlier. Each individual with their initial study before the class and now as a team (consisting of 5 each) were given time to discuss for 10 minutes.

- d. The case was effectively discussed in the classroom by asking an open question to the students - What are the loopholes in the case? And asked them to offer suggestions if they are in place of Ananth.
- e. Each team was allowed to speak for 1-2 minutes on the questions which were asked. They were not allowed to repeat the answers given by the previous teams. (20 minutes)
- f. The facilitator/ faculty recorded their answers under the following sub-headings (20 minutes)
 - i. Facts
 - ii. Issues/problems
 - iii. Assumptions
 - iv. Alternative solutions
 - v. The best solution
 - vi. Action plan for implementation
 - vii. Takeaways

Questions

- a. What are the facts and assumptions you can identify from the case?
- b. Identify the issues and possible solutions for the same.
- c. What is the role of a Banker/ Branch manager in the banking sector?
- d. What is the action plan you will take if you were the banker to minimize willful defaulters and NPA?
- e. What techniques can be used to give effective customer service?
- f. What are the software and applications that are available for calculating NPA and identifying the defaulters?
- g. How can we enhance customer relationships and what measures can be taken to increase customer satisfaction?
- h. Do you think effective training to the employees for working extra miles works?
- i. Do you agree with Ananth regarding the way he was handling the customer issues? If no, please give the method you would have used if you were in his place.

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9. www.rbi.org.in

Experience in using the case

When the case was administered to MBA Finance students, the students were focusing on the following aspects:

1. Stages how the debtor is converted into NPA
2. The role of the advisor/banker of the bank
3. Identifying willful defaulters and the process of declaring as willful defaulter

When the case was administered to MBA Marketing students, the students were focusing on the following aspects:

1. CRM Process in the banking industry
2. Customers' psychology and handling the customers' issues

3. Highlighted the ways the customers' loyalty can be enhanced
4. Doing a SWOT analysis of customer profiles before solving any issues
5. Bridging gap between customer requirements and expectations

Case Study 08

Testing Waters without Oars*

Background

Achintya University was a progressive University established in the year 2013 in the city of Nagpur, Maharashtra (Central India). The University was headed by the Vice Chancellor Dr Sadashiva Sharma. Dr Sharma was a renowned academician, researcher, and a fine leader. The efforts put in by Dr Sharma made Achintya University a well-known name in the city of Nagpur, even though the University was quite young. The University was comprised of number of departments headed by different senior and experienced faculty members. However, the Department of Science needed a Head. The Department of Science had nine full time faculty members and 90 students on roll. The University wanted to recruit a senior person as the Head of the Department for the Department of Science. An advertisement was published for the same in a national daily on 15th April 2017. The University received several applications for the post, out of which 15 applicants were short-listed for personal interaction.

After interaction, two candidates were found suitable for the said position. The first candidate Dr Rudrapratap Rastogi was an academician and Head of the Department of Science of Vishwakarma College of Engineering and Science, Amravati. Dr Rastogi had a long experience of heading the department at various Institutions across Maharashtra. He had around 25 Research Publications to his credit. However, his biodata revealed that he changed jobs frequently and did not stay in any organization for more than 3-4 years.

The second candidate was Dr Sohanlal Das. Dr Das had just retired from the position of Senior Manager from a reputed steel company named Barron Steel Ltd., Rourkela after a glorious and a stable career of 35 years. He was now looking forward to having a second career in the field of academics. He had pursued his Ph.D. from IIT Kharagpur around 25 years back by availing study leave. Prior to joining Barron Steel Ltd., he

* This case was developed by Upinder Dhar, Santosh Dhar, Namrata Jain (Shri Vaishnav Vidyapeeth Vishwavidyalaya) and Prajaktta Deshpande (Vikrant Institute of Management) during 12th National Case Writing and Teaching with Cases Workshop organized by Shri Vaishnav Vidyapeeth Vishwavidyalaya, Indore from June 21 - 25, 2021.

had worked in a Technical Training Institute, run by the Association of Industries at Baroda for 3 years.

The panel at the Achintya University found Dr Das as a promising candidate on the pretext of his doctorate from the prestigious Indian Institute of Technology Kharagpur and his long as well as stable work experience. He seemed quite confident, having passion for academics and the one who was looking forward to a good opportunity at the University. The panel believed that his exposure to industry and academic background of having studied in a reputed institution could enrich the students and at the same time facilitate the career advancement of the young faculty members in the department. Moreover, during the interview, he also assured the panel to have a good number of publications under his mentorship.

A good professional experience and an academic orientation was the essential blend that the University was looking for in a candidate. Thus, Dr Das seemed to be the right fit for the position of Head, if his poor publication record was ignored. The selection committee finally recommended the candidature of two candidates wherein Dr Das was kept as a first choice while Dr Rastogi was kept as a second choice. The university offered the position of Head of the Department to Dr Das, which he joined on 1st July 2017.

Lack of Initiative to Learn

Dr Sohanlal Das had family in Rourkela. After two months of receiving the appointment letter, he shifted alone to Nagpur. The University provided him residential accommodation. During the interview, he had assured the panel that his family would move to Nagpur as soon as he would settle down in the new accommodation. His wife was a homemaker and was taking care of the children in his absence. His son was pursuing B.Tech. and daughter B.Sc. from Rourkela. His daughter had plans of pursuing M.Sc. from Nagpur.

During the initial phase, everything went on smoothly. He was given free hand in developing the department the way he wanted to and was advised by the University to develop rapport with the faculty members working in the department. With his good social behaviour and strong interpersonal skills, he was quickly accepted by faculty members as Head of the Department.

Dr Das started travelling to Rourkela every month as his family had not shifted to Nagpur yet. He took leave on Fridays and returned on Mondays. Observing his frequent leave applications for travel, the Vice Chancellor Dr Sharma advised him to move his family to the University campus. Moreover, this would allow him to focus on his work and would not cause unnecessary hindrance in discharging his duties as Head of the Department. Also, the young faculty members would not feel directionless due to absence of his leadership from time to time. The Vice Chancellor came to know that his wife had full time regular employment at Rourkela which he had not divulged at the time of interaction.

Dr Das did not find any of his nine faculty members competent or bright, despite the fact that one faculty member Dr Shivani Saxena (Assistant Professor) had completed her Ph.D. from IIT Madras. Dr Saxena was appointed on the basis of merit three years back and was known for having a good command over her subject. When the Vice Chancellor asked for routine feedback about the faculty members of his department, Dr Das gave a bad report about everyone including Dr Saxena. Dr Sadashiva Sharma advised him to develop the faculty and assured him full support of the university administration.

Incident 1: Over the period of time, the Vice Chancellor asked Dr Das to share the recommendations of the board of studies regarding revision in the syllabus, and justification for new programs proposed by the board. Dr Das shared the recommendations but was unable to satisfactorily respond to the Vice Chancellor's queries. It was observed by the Vice Chancellor that Dr Das merely read out the reports prepared by faculty members of his department. He never involved himself in the preparation of the minutes of meetings of the statutory body. On the contrary, he assigned the task to the faculty members only without providing any guidance to them. Every time the Vice Chancellor asked for clarification on a particular recommendation, Dr Das made an excuse by saying that he would check and get back to him.

Incident 2: Once he came up with the proposal that all the instruments and equipments which were non-functional and unused in the laboratory should be repaired and, if required, replaced. He received the nod from the Vice Chancellor following which all the instruments were repaired. However, after a lapse of three months, the Vice Chancellor noticed that the repaired instruments were still not used and thus the situation remained unchanged.

Incident 3: Another time, he proposed to organize a National Conference wherein he wanted to publish a conference book comprising of research papers. As he was new to the task of editing, he requested the Vice Chancellor for providing him some help. Finding his request genuine, Dr Sharma asked Dr Parth Batra who was a senior professor and Head of Chemical Engineering Department to help Dr Das in the editing work. Despite his hectic schedule, Dr Batra devoted lot of time and completed the editing work single handed. Finally, the conference book was released during the conference on 10th September 2018.

Incident 4: Later for the second National Conference in June 2019, Dr Das again requested Dr Batra to help him. But this time, Dr Batra declined his request and suggested that he should do the work himself now. Dr Das approached Heads of other departments one after the other, pleading them to do the editing work for him. Instead of developing skills and immersing himself in the academic environment, he kept depending on others for completing his work. Although he had a good grasping power, he did not use it to his full potential. He chaired many sessions in different conferences from time to time. Due to his good oratory skills, he was often invited by other departmental heads for chairing the sessions. But he failed to develop technical nitty-gritties required to edit the conference book.

For the second National Conference, Dr Das made his colleague Rakesh Chitnis the Conference Co-ordinator. Rakesh was working as Assistant Professor in the Department of Science. He performed all his duties as a co-ordinator with due diligence and efficiency. He did everything to make the conference a great success right from the promotion to review of research papers, approaching publishers, inviting quotations, etc. But to his dismay, his name was not included in the editorial team of the conference book by Dr Das. When the Vice Chancellor asked about the reason behind not including Rakesh in the editorial team, Dr Das gave excuses like Rakesh was novice and was learning the nuances. Dr Sadashiva Sharma felt that Rakesh was exploited by his Head of the department, as he was neither given due credit for his contribution nor an opportunity to develop the skills of editing.

Incident 5: After a while, the University assigned a Research Scholar to Dr Das. But the scholar too complained that the professor could not guide him properly. The scholar felt frustrated. Despite his willingness to put in hard work, he did not get anything in return from his guide. The scholar was many-a-times remarked as 'useless' by Dr Das. He could not clear the draft of the thesis for a long time as he lacked writing skills, thereby, adding uncertainty in the candidate.

Incident 6: After a few months, Dr Shivani Saxena was verbally abused by Prof S K Narayan who was Head of the department of Science before Dr Das joined the university. Narayan was a senior faculty member of the department who called Dr Saxena a fool and an idiot in front of Dr Das. Instead of putting things right and advising Narayan to apologize for the act, Dr Das kept silent and indirectly favoured Narayan who had worked in the department since its inception. Narayan was believed to be the right hand man and advisor of Dr Das by faculty members of the department. Dr Saxena was quite disappointed by this unjust and unfair treatment. She felt that her esteem was not protected by his head. Dr Saxena felt that Dr Das was biased.

Dr Saxena went ahead and complained about the same to Dr Parth Batra, Head-Chemical Engineering Department. While Dr Saxena was sharing her experience about the incident with Dr Batra, Dr Das entered Dr Batra's cabin. Dr Batra tried to initiate a friendly chat and asked Dr Das the reason behind favouring Narayan. Dr Das instead started blaming his junior colleague Dr Saxena for her behavioural tantrums and non-cooperation with other faculty members of the Department. Dr Saxena was disappointed once again and felt that her leader was partial. She looked at Dr Das as a father figure because of the age difference and did not expect such lapses in his judgement.

Shying Away from Challenges

Despite his good communication skills, Dr Das failed to communicate to the Vice Chancellor about the issues that he faced everyday in his department. Instead he engaged himself in grapevine telling the other department heads about his non-cooperative and inefficient faculty colleagues. Whenever Vice Chancellor asked him about the functioning of his department, he refrained from telling the truth and ended up painting a rosy picture. He would not actually share the truth which he used to do with others in the university. The enthusiasm which he had shown in initial meetings was proving wrong and he lacked the courage to accept his inability to keep his promises. He was unable to build the team in his own department and faculty had started to refuse his instructions at times. Vice Chancellor gathered this only after he left the University. The authority believed that something could have been done to resolve the issues, had he shared his problems at the right time.

Though Dr Das had voluntarily decided to transit from Industry to Academics, he could not develop the academic orientation. He never faced any issues related to students. He followed the Activity Calendar of the University, continued organizing events like Science fest, Science quizzes, Science club activities, etc., as advised by

Narayan to him. He was about to complete two years as Head but due to his frequent absence, the department was affected as everybody felt lack of direction. Dr Das was practically divided between Nagpur and Rourkela. The faculty members were not getting the required direction from the leader. They could not complete their Ph.D. on time, nor could they publish their research papers. When he joined the University, there were 90 students in the department. This number drastically dropped to 35 by the end of two years. The University was alarmed. Even though the University appointed him believing that his vast experience would enrich students as well as faculty members, Dr Das could not meet the expectations.

Dr Sohanlal Das finally decided to submit resignation, as he felt guilty of not delivering what was expected from him and made up his mind to go back to Rourkela. When he met the Vice Chancellor for submitting his resignation, Dr Sharma enquired if he had any other offer in hand from any other institution, which he simply denied. Dr Sharma advised him to continue unless he has some personal problems. Dr Das said that since his wife is working at Rourkela, he would like to join her there only. He was happy to have worked in the Achintya University for the period of about two years and had a good learning experience. He recommended that Narayan may be given the responsibility to head the department after he is relieved from the university, and till a new person joins as head. However, Dr Sharma - the Vice Chancellor relieved him and decided to give additional responsibility to Dr Amit Kumar, who was Head of the Department of Statistics.

Questions for Discussion

1. Should a degree from the premiere institutes like IITs and IIMs be the only and ultimate consideration while selecting a candidate for a job? Or competence should be considered more important criterion for selection?
2. Whether the decision of the panel to waive off the publication requirements for recommending Dr Sohanlal Das was justified?
3. Was it ethical on the part of Dr Sohanlal Das to keep Rakesh Chitnis out of editorial team? Support your answer with implications.
4. Dr Sohanlal Das was not able to evolve as a leader. In your opinion, what were the reasons for his non-performance?

Teaching Note

Testing Waters without Oars

Synopsis of the case

The case narrates the inability of head of the department to deliver in an academic institution who had a successful career in the industry for the last 35 years and doctoral degree from a well-known national institute. It throws light on the fact that premier institutions may create a *Halo Effect* during the selection process. The field of academics is not free from challenges and hence academics may not be considered as second career in case the person has not any keen interest in it. The competency and skill sets required to survive in academics are entirely different. It shows how the reluctance on the part of head in sharing the departmental problems with the Vice Chancellor affected the department and students.

The target learning group

- Management Students
- Participants of Faculty Development Programs

The learning/ teaching objectives and the key issues

- a. To highlight the importance of leadership skills and ethical practices.
- b. To make readers understand how the absence of good leaders in power positions can create an adverse impact in an organizational setting.
- c. To make students understand how important it is for a leader to share the problems with the higher authorities.

Key issues

Leadership skills, conflict management, trust, commitment, and ethical practices

Teaching strategy

Students should have a clear understanding about the concept of leadership in an organization and also about the professional ethics. The case should be discussed at individual as well as group levels. The number of participants in a group may be 4-5.

Questions

- a. Was it bad planning on the part of Dr Sohanlal Das that resulted in his resignation from the university?
- b. Do you think that the people who serve industry for a long period are not able to be effective as academic leaders in educational institutions? Comment.

Background Reading

The students should read about leadership and professional ethics at workplace by referring well known text books.

Case Study 09

Sadasukh Chemicals Ltd: Managing Challenges*

As the weekend came to an end Jigar Mehta, HR Manager at Sadasukh Chemicals Ltd sat back and evaluated his 7-year association with the company. Sadasukh Chemicals Ltd started in 1980 in Hyderabad, India, with R&D centre located in the same city. The company grew from strength to strength and in 2018, the company was ranked as one of the top 5 API manufacturers in India. Established by Yuvraj Singh, the organization's core competencies were in manufacturing and exporting of Active Pharmaceutical Ingredients (API) mainly Metformin HCl, Allopurinol, Fenofibrate, Divalproex Sodium, Phenobarbital/Phenobarbitone, Riboflavin Phosphate Sodium, Glycopyrrolate/Glycopyrronium bromide and more.

As HR Head, Mehta's focus areas were attracting, developing and retaining apt human resource. In 2018, the attrition rate was close to 17% in a market where employee turnover oscillates between 15-18%. As Jigar Mehta deliberated on this, his colleague Ms. Kumud walked in to discuss the HR impediments to the growth of the company. Growing competition and Hyderabad being the hub of pharmaceutical and allied companies was posing a big challenge for attracting the best candidates to this mid-size company.

As the company moved to multi locations, HR had to put arduous efforts through robust employee engagement initiatives. The company upped its game by providing quality housing to its employees. From mere flats, the company started offering well-appointed houses to its employees.

Kumud was a newly joined management trainee. Mr Mehta while discussing the status of the company took Kumud down the memory lane. After its inception in 1980, the company achieved its next milestone when Paracetamol production started. In 2006, the company received Generic Companies in USA, EU and Canada Site I, i.e., Subbunagar, Hyderabad, Telangana, India and for the first time Hyderabad site was

** This case was developed by Jyotinder Kaur Chaddah, Kuljit Kahlon, Ritu Tuli, Sameer Salunkhe and Subhash Yadav (Guru Nanak Institute of Management Studies, Mumbai) during the Case Writing Workshop organized by Guru Nanak Institute of Management Studies, Mumbai, India from December 2-4, 2019.*

inspected by US FDA. This was followed by achievements in 2008 where the company got accreditation from various internationally acclaimed bodies.

As both discussed the past laurels, they pondered on how their department will match the expansion objectives and requirements of the company. A specialized new R&D facility would be operational by Jan 2021 at Ahmedabad, Gujarat, India. The company was recognized as an 'Export House' by Ministry of Commerce, Government of India, optimizes its manufacturing processes and documents them as per GMP requirements.

Year	Milestones
1980	Inception of Sadasukh Chemicals Ltd
1990	Paracetamol Commercial Production Started
1994	Riboflavin Phosphate Sodium Commercial Production Started
1995	Metformin Hydrochloride Commercial Production Started
2003	Received Certificate of Suitability from EDQM for the product Metformin HCl
2004	Received Certificate of Suitability from EDQM for the product Allopurinol
2006	Received Generic Companies in USA, EU and Canada Site I in Telengana
2008	Accreditation of Health Canada, Korean FDA, WHO- GMP, Japanese health authorities
2009	TGA Approval
2010	Received Certificate of Suitability from EDQM for the product Fenofibrate
2012	Site II – Hyderabad Korean FDA inspected
2015	Received Certificate of Suitability from EDQM for the product Glycopyrrolate Received Certificate of Suitability from EDQM for the product Methadone HCl Received Certificate of Suitability from EDQM for the product Riboflavin Sodium phosphate
2017	Cofepris inspection for Hyderabad site for Divalproex Sodium
2018	Site I and Site II, Both inspected by USFDA
2021	New R&D facility coming up in Ahmedabad

API: Life line of Sadasukh Chemicals Ltd

The company was a market leader in API catering to Global client base only, namely pharma giants like Dr Reddy's and Novartis. The product portfolio of APIs includes thyroid, diabetes, relaxant, CO-PD., to name a few. It works on a 10-15% Margin in

this product line. The company had been at par with its peers in terms of technology. They invested time and resources for impurity profiling in which nitro chemical components are checked and the same was audited by US FDA and EUGMP. While this gave the company scale and recognition among their international clients it also brought home a challenge in terms of cost control.

Mastering API business by adhering into International norms and compliances helped them to survive the competition for over 35 years. Together India plus China accounts for 70% of API manufacturing market. Aligning with Make in India policies, the company reached a stage where it is exporting API to China which was previously supplying APIs. From being a market leader of API, it took steps towards formulation of drugs. The company focused on forward as well as backward integration. Backward integration was initiated with manifold advantages like cost control, reduction in over dependence on key intermediates curbing competition and exploiting new market opportunities.

Though Sadasukh Chemicals Ltd dabbled in API, the formulation segment with emphasis on lifestyle drugs, will have presence forever, which made the company immune to market and cyclical fluctuations. The management perceived that their revenues will be boosted as formulation segment had the potential to provide a profit margin of 50%. To tap this potential, the management invested in a new laboratory. This specialized new R&D facility was located at Ahmedabad, Gujarat, India, with operations to begin in Jan 2021. Non-infringing processes for APIs, Contract Research and Manufacturing System (CRAMS), and Turnkey basis projects will be developed here. The lab was equipped with latest computer-controlled reactors for all research applications. It will have complete characterization tools like NMR, IC MS/MS, GCMS, FTIR and XRD.

To give a push to forward integration, the company encouraged research in formulations segment. Around 3 to 4 niche products were researched in the segment of life style drugs, the clinical trials for which started in 2017. The fruits will be reaped in next 5 years' time giving a leap to the turnover from Rs.540 Crores in 2019 to Rs.790 crores by 2023. The company had 1200+ employees in 2019, of which 1000 employees were working on API business and the remaining 200 professionals were deployed on formulation segment.

In 2019, around 85% of APIs in the Indian pharmaceutical industry were imported from China due to the advantage of low cost of production. However, a report on India-China trade released in 2019 by the Ministry of Commerce and industry claimed

that the cost of production in India is highly competitive vis-à-vis China with a difference of only 3%, which was attributed to labour cost. As per the report, the material, depreciation and indirect personnel cost remained the same in China as in India. Contrary to the market scenario of overdependence on imported APIs, Sadasukh Chemicals Ltd turned this in its favor. API segment contributed around 14% profit margin. The company then started exporting API's to China.

In 2019, both India and China, together accounted for 70% of API manufacturing. There was a sudden hike in the price of APIs imported from China by 25 – 30% which reduced margins for the Indian drug makers. This was due to crackdown on polluting industries, primarily pharmaceutical and chemical industries. This worked in favour of Sadasukh Chemicals Ltd as it has moved to backward integration of manufacturing the pharma intermediates on its own. It reduced its dependence on imports and attracting more global clients to its portfolio.

Money matters

Pharma sector, being highly capital-intensive, due to pressing needs of large capital investment in R&D, the company was successful in running its business smoothly without any dependence on borrowed funds. No doubt it was positive in terms of no dependence; however it was somewhere a constraint in the growth due to rising demands of the sector. High technology development due to updating of regulatory norms every year, to survive it became mandatory for the company to upgrade. The company faced the dilemma of cost management; simultaneously there was a pressing need for more financial resources to upgrade.

As the conversation ended, both Jigar Mehta and Kumud left the room with unresolved issues.

Questions for Discussion

1. In your opinion, what are the challenges posed by upgradation of technology on the company?
2. What strategies should company adopt to meet the funds requirements for different initiatives?
3. While being cost effective, suggest retention initiatives to be taken by the company, to reduce the attrition below the industry average?

4. What should the company do differently to attract suitable employees to match the requirements of the business in a highly competitive market?
5. What challenges should the management keep in mind while initiating backward and forward integration?
6. Do you think the management right in its decision of expanding its focus from API segment to Formulation segment?

Teaching Note

Sadasukh Chemicals Ltd: Managing Challenges

Snapshot of the Case

Sadasukh Chemicals Limited is a leading Indian Pharmaceutical company that specializes in the manufacture and export of Active Pharmaceutical Ingredients (API). From being a market leader of API, it has taken steps towards formulation of drugs. What sets the company apart is its focus on forward as well as backward integration. As the company gears up to expand its business it aims to solve the challenge of how Human Resource department will match the expansion objectives and requirements of the company. The company is also facing the dilemma of cost management; simultaneously there is a pressing need for more financial resources to upgrade. Further, Pharma sector, being R&D oriented is highly capital-intensive. Even though the company upto now is successful in running its business smoothly without any dependence on borrowed funds, capital was somewhere a constraint in the growth due to rising demands of the sector. And finally, in its bid to grow should a company continue doing what it does best or is it prudent to shift its focus within the same line of business.

Target Learning Group

Management Postgraduate students across different programs like EMBA, PGDM and MMS (All Specializations).

Learning/Teaching Objectives

- ✓ To **identify** strategies that corporates should adopt to meet the funds requirements for different initiatives.

- ✓ Analyze HR department's innovative initiatives to attract suitable employees to match the requirements of the business in a highly competitive market.
- ✓ In its bid to grow should a company continue doing what it does best or is it prudent for it to shift its focus.
- ✓ As the regulated sector upgrades its technology, certain challenges are posed for companies like Sadasukh Chemicals.
- ✓ Understand the reason why the company went for backward and forward integration.

This case is appropriate to a 90-minute teaching session as follows:

Carefully read the case study and refer to the Appendice/Appendix	20 Minutes
Identify the highlights and analyse the issues and challenges	15 Minutes
Final Analysis	15 Minutes
Discuss Answers to the Questions	10 Minutes
Summary and Conclusion	10 Minutes

Background Reading

1. Strategic Management – Thompson & Strickland McGraw Hill Irwin
2. Strategic Management – N Chandrasekaran & P.S Ananthanarayanan – Oxford Publications
3. Concepts in Strategic Management & Business Policy – Toward Global Sustainability – Thomas L Wheelen, J David Hunger – Pearson Publications
4. Exploring Corporate Strategy by Gerry Johnson and Kevin Scholes.-Prentice Hall India
5. Strategic Human Resource Management by Jeffrey Mello, Thomson South Western
6. Strategic Human Resource Management – Tanuja Agarwala – Oxford Publications
7. Reports of Pharmaceutical Industry
8. Videos link: What are APIs <https://youtube/SMi9J0eMy08>
9. API export restriction: https://youtube/SV_OMiOzJ5A

Case Study 10

The Quick Couriers Quandary*

How does it feel when a person gives twenty-five years of his life in the growth of a company and the company dishonours him? Should one continue to work or should one prioritise his self-respect? Should the company continue to have such an employee despite his few failures? Situations leading to such questions put the company as well as the employee in dilemmas. This case study of a courier company and one of its employees describe such situations and facts.

This is a case of a senior level manager in “Quick Couriers” company which was established in 1970 as a private limited company and which in 1995 became limited company, although its operations and ownership was still following the private limited model. By following the private limited model, most decisions were made by top management usually the CMD, ED, CEO, etc. As most decisions rested with top management, some kind of bureaucracy existed in the company structure. Bureaucracy requires a chain of command with perfect reporting structure within the organization. Although modern management does not consider bureaucracy as important, it can significantly affect the operations of a company. Although modern management does not consider bureaucracy as important, it can significantly affect the operations of a company.

J Kumar was a highly qualified senior level Manager, who joined the company on 6th August 1993 – holding a Bachelor’s degree in Engineering and MBA in Operations Management at the time of his appointment. He started his career in the north-eastern region of India and performed well despite the challenges presented by the region and rose from the rank and file of the company and became a zonal manager, Kolkata HUB, senior manager HUB operations and zonal operational manager. His performance history was found to be above average. During his journey, he was praised as well as rewarded by the company.

* This Case was developed by Nilendu Chatterjee, Nawneet Subba, Debolina Gupta, Jacob Lalango Oyugi and Mandira Roy Chodhury during the Case Writing Workshop Organized by Calcutta Business School, Kolkata and Bengal Chamber of Commerce and Industry (BCCI) from July 5-10, 2021.

The Company's reporting structure is dual in nature, that is, it has two components. Firstly, the administrative reporting is done to the director, head of customer care department and functional reporting is done to the head of operations, head office Mumbai. So, for any employee it was a tough ask to satisfy as well as maintain both forms of reporting structure. J Kumar had control over 42 permanent staff reporting to him across the eastern region. Also, his other accolades are speedy delivery and seamless operations especially during times of trouble and natural calamities like floods, etc. So, he was efficient in many aspects.

He is presently 50 years of age. During the time of his leadership development process his qualities and strengths began to flourish. He was found to have a sound domain knowledge; he was a person of innovative ideas and helped optimise the cost and operations of the business and he was a very people centric person and his dealings with people was generally above satisfactory. He had a few weaknesses as well; being a very simple and trusting person he was easily tricked by those more shrewd or cunning around him. Also his style of work was hard work and not smart work along with that his communication skills, both verbal and written, were adjudged to be poor in nature and lastly he was said to have more ego compared to the position he was holding.

Looking at the scope of the position in the company, his activities in the organisation, the following Key Result Areas (KRAs) can be prepared as follows: -

1. Delivery of consignment within schedule.
2. Ensuring smooth vehicular movement across branches/franchisees across the eastern region and the Kolkata hub.
3. Direct interaction with institutional clients.
4. Mitigation of customer complaints of high-value consignment.
5. Efficient allocation of manpower – both permanent and under contract for better optimisation of cost and consignment.
6. Coordination with security personnel for high-value consignment protection.
7. Implementation of digital tracking and monitoring system.
8. Resolution and closure of all consumer forum cases within a month.

Also, here it is to be noted the term consumer/customer pertains to both internal as well as external customers/beneficiaries. The internal beneficiaries being the customer

care executives, administrative personnel of- HR, finance, operations, IT team, even lower level staff. The external being – institutional customers like big corporations, local police stations, political leaders, outside agencies and vendors, etc.

In 2019 he faced a serious challenge at work as a result of service quality gap when there occurred an issue regarding delay of delivery in the Bihar region; escalating the problem was the fact that the customer as well as the consignment was deemed to be of high-value. Naturally, the customer voiced his grievance regarding the matter and looking at the nature of affairs it was released up to the regional management level. J Kumar instead of dealing with the matter personally had advised his friend, B Agarwal, a zonal operational manager to resolve the issue. His friend somehow eluded his responsibility thus, escalating the problem further by creating a time lag of 3 to 4 days.

The regional manager of Bihar issued a formal complaint to the head office in Mumbai. As a consequence of this, J Kumar was called for a review meeting where he got a proper dressing down from the higher authorities and was humiliated and threatened badly to the extent of even being possibly kicked out of the company. Bitter about his humiliation and heavily demoralised, almost to the brink of collapsing he came back with a heavy heart, went to Bihar, stayed there for about two weeks and solved the issue. But, the humiliation dented him so badly that he complained to the Assistant Manager Personnel and Administration about the treatment meted out to him and wished to quit.

The Head HR on receiving the complaint ordered the Assistant Manager Personnel and Administration to take stock of the matter and give a feedback. The assistant manager in turn spoke with the regional managers and other stakeholders discreetly in order to get to the root cause of the issue. What he found out was that this was not the first time such a case had occurred with J Kumar. A similar incident had occurred six months ago where he had failed to discharge his duties. At that time the assistant manager was able to solve the issue with some consolation. He was reported by the customer care executives that there were two separate cases that showed incompetence /failure of operations under J Kumar: The first case being the incident of a high-value demand draft being found in the scrap yard of a building, undelivered. The second one being a high-end mobile phone, again, undelivered and stolen by one of the operations staff, some people having been penalised in that matter. What he found out was that J Kumar had let the problem escalate without taking any proactive

measures and in his defence J Kumar told that the problem was procedural in nature which was no fault of his.

Therefore, under these conditions, the assistant manager checked with his peers and juniors in order to gather information about J Kumar as a person and a manager. The feedback that he got was that the aged employees and the staff close to him were supportive of him for his qualities. However, the newcomers were not satisfied with his performance; they opined that he was slow to react in many cases and was lacking managerial skills, also, his networking and inter-departmental collaboration skills along with his presentation skills were deemed to be poor. He could, at best, be groomed to become a leader but certainly not a manager.

The company, though in a dilemma, is of the mind that he should stay. Their reasoning behind such a decision was that he has good domain knowledge of operations, a good knowledge of the local demographics and good interpersonal relations with junior and outsourced or temporary staff. Also coming out from the rank and file of the company and being an old horse of the organisation, his experience is also taken into account. But, the humiliation to J Kumar has hurt his self-respect so badly that he wants to leave the company, although his positive contribution has outweighed his faults.

Questions for Discussion

1. Identify the job description and job specification required to handle the role of an Administrator /Operations manager in a courier company.
2. Point out and analyse the various failures that led to the debacle in Bihar. Who do you think was responsible for it?
3. "...He could, at best, be groomed to become a leader but certainly not a manager". As a student of management, give your informed view bringing out clearly the difference between being a leader and a manager.
4. If you were the CEO of the company and you had a similar situation whereby an old employee with good credentials was being criticized by your subordinates and your new colleagues and was stated to him be let go, what would you do?
5. How would you assess J. Kumar as a manager using SWOT analysis tool?

Teaching Note

The Quick Couriers Quandary

Synopsis

The narrative is presented by focusing on creating a sense of empathy for the protagonist (J Kumar). This can be done by accentuating J Kumar's qualities as both an employee and a person. Having joined the courier company in a very low position at a very distressful area, he rose to the managerial position of a capital city by his own capabilities. But, having served for 25 years, he faced few serious challenges and got harassed by the higher authority and wanted to leave but the company wants to have him. So, it is a case of trustworthiness versus ego from the main protagonist's point of view. From company's point of view it is a case of economic feasibility versus ethos versus emotional attachment.

Target Audience

MBA Students, Executives, Undergraduate (BBA Students)

Learning Objectives

- To understand working relationship of the employees at work place.
- To analyze the managerial dilemma to recognize the ethical issue regarding employee termination.
- To be able to measure the core leadership value using servqual model of the perception of services.

Teaching Strategy

The class should have 5 minutes to discuss and deliberate their stance per questions. Once the class voices opinion, the instructor should interject the ideas of past researchers and philosophers focusing on the concepts of servqual model and employees performance with the impact of the generation gap. Service quality in the SERVQUAL model consists of five dimensions: reliability, responsiveness, assurance, empathy, and tangibles. These dimensions are used in service quality gap, which implies that there is a difference between the expectations of customers and perception of services.

Questions

1. Identify the job description and job specification required to handle the role of an Administrator /Operations manager in a courier company.

Hint: One needs to have not only Management/Engineering degree as his/her academic degree but one needs to have good relations with employees of all levels starting from CEO of the company to the driver of the delivery car. He/should have good command over as well as relationship with both internal and external customers.

2. Point out and analyse the various failures that led to the debacle in Bihar. Who do you think was responsible for it?

Hint: Whether it was J Kumar's fault, or B Agarwal's fault or was it a Procedural fault. Even a combination of all these could be the answer.

3. "...He could, at best, be groomed to become a leader but certainly not a manager". As a student of management, give your informed view bringing out clearly the difference between being a leader and a manager.

Hint: The case suggests that there are differences between a leader and a manager. Points of discussion are as follows:

Leaders create a vision, managers create goals

Leaders paint a picture of what they see as possible and inspire and engage their people in turning that vision into reality. They think beyond what individuals do. They activate people to be part of something bigger. Managers focus on setting, measuring and achieving goals. They control situations to reach or exceed their objectives.

Leaders are change agents, managers maintain the status quo

Leaders are proud disrupters. Innovation is their pride. They embrace change and know that even if things are working, there could be a better way forward. And they understand and accept the fact that changes to the system often create waves. Managers stick with what works, refining systems, structures and processes to make them better in order to achieve organization goal.

Leaders are unique, managers copy

Leaders are willing to be themselves. They are self-aware and work actively to build their unique and differentiated personal brand. They are comfortable in their own shoes and willing to stand out. Managers tend to adopt best practices that make organizations succeed.

Leaders take risks, managers control risk

Leaders are willing to try new things even if they may fail. They know that failure is often a step on the path to success. Managers work to minimize risk. They seek to avoid or control problems rather than embrace them.

Leaders build relationships, managers build systems and processes

Leaders focus on people – all the stakeholders they need to influence in order to realize their vision. They know who their stakeholders are and spend most of their time with them. They build loyalty and trust by consistently delivering on their promise. Managers focus on the structures necessary to set and achieve goals. They focus on the analytical and ensure systems are in place to attain desired outcomes

4. If you were the CEO of the company and you had a similar situation whereby an old employee with good credentials was being criticized by your subordinates and your new colleagues and was stated to him be let go, what would you do?

Hint: What should a company do for an employee who has served for so long? Given the fact that he has performed above average and rose from a very low position, company can think of giving him trainings to improve his performance. Not to forget the fact that the old employees had supported him and his performances. So, there could be ego problems as well between the old and new employees.

5. How would you assess J Kumar as a manager using SWOC analysis tool?

Hint: Teacher has to point out the strengths, weaknesses of J Kumar along with the opportunities and challenges the company would have to face in future if they decide to have him.

Background Reading

Alan, J.R. (1991), "More to offer.", *Computerworld*, 25(36), 64–65.

Bitner, M.J. (1990), "Evaluating Service Encounters: The Effects of Physical Surroundings and Employee Responses", *Journal of Marketing*, Vol. 54, April, pp.69-82.

Bitner, M.J., Booms, B.H., & Tetreault, M.S. (1990), "The Service Encounter: Diagnosing Favorable and Unfavorable Incidents", *Journal of Marketing*, Vol. 54, January, pp. 71-84.

<https://www.businessmanagementideas.com/service-marketing/service-quality/20971>

<https://masonleads.gmu.edu/about-us/core-leadership-values/>

<http://www.hrhero.com/sample/trialdiscipline.pdf>

<http://www.businessmanagementdaily.com/10141/the-5-steps-of-progressive-discipline>

Books:

Marketing Management by Philip Kotler, Kevin Lane Keller, Mairead Brady, Malcolm Goodman, Torben Hansen

The 7 habits of Highly Effective People by Stephen R. Covey
Analysis of Service Quality using Servqual Model by A. Kumar

Experience

This is a new case which is yet to be discussed in classes.

Book Review 01

The Game of Digital Marketing

(Author: Shivam Singh. Chennai: Xpress Publishing, Year of Publication: 2020, ISBN: 9781648694592) Pages: 144, Price: Rs.170

*Ashish Kumar Biswas**

The digital presence has become the mainstay for any business to grow, flourish, and be the best-of-breed to have a competitive edge. To be coordinated with the new business needs, all the marketing managers must understand the game of digital marketing. This book enfolds the spectrum of digital marketing integrant and answers five Ws and one H (Who, What, When, Where, Why, and How). The book has seven thematic chapters about content marketing, email marketing, social media marketing, digital advertising, mobile marketing, automation in marketing, and measuring the campaign performance in digital marketing.

To accomplish the digital platform's business aspirations, marketers need to be specific about digital marketing objectives. The author focuses the attention on the objective setting as a steppingstone for any digital marketing strategy. An adequate goal will convoy the campaign and play a prominent role in summing up the campaign effectiveness and future roadmap. The author sows the seed of digital marketing concepts by explaining the importance of creating the persona, reflecting the customer's concerns, consumption patterns, and goals, which allows the marketer to develop engaging targeted content.

In this day and age, a potential buyer is drowned with more than 2900 solicitation marketing content per day, and 71% of customer trust companies that offer them reliable and qualitative information. So, it is indispensable for digital marketers to preserve the consensual relationship with the budding or existing customers. Hence the author advocates the importance of reaching the target audience with predefined objectives, the right mix of content in the form of eBooks, templates, infographics, blogs, case studies, and appealing presentations. The following chapter is about the rejuvenation of the first digital marketing communication tool, i.e., Email. 95% of the Indian internet users check their emails every day [SNCD Study 2016]; so the aura of

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Email is still far from dead. Email marketing is facing much defiance in the current era because of the change in the online usage pattern and introduction of alternate communication channels. The author propounds the concept of contemporary email marketing strategy, which emphasizes the shift from primary to a cross-channel conversation. And the communication content must target the audience's need and consistent in terms of timing, frequency, content, graphics, and email subject line.

"If a customer is unhappy with you in the real world, he can say no more than six people. But if a customer is unhappy with you on the internet, he can tell 6000 people," says Jeff Bezos. Social networks are no longer just tools to improve visibility; it is a kingpin of the digital marketing plan. This chapter delineates the edge of using new media like Facebook, Twitter, LinkedIn, Pinterest, Instagram, SlideShare, and YouTube in the cutthroat marketing competition. Also emphasizes on how to nurture a lead apart from building of social strategy and ways to calculate the RoI. One-to-one content, rich media, automated programs, and cross-channel interaction assists digital advertisements to connect with the intended audience with ease as it makes a relatable story, not just an advertisement. The principal goal of any marketing campaign is acquisitions, nurturing, and retaining potential buyers at low cost and at less time which can be done either by an in-house or external agency. The author discusses the pros n cons of both choices and re-emphasizes furnishing quality content with an appropriate call to action depending on the business need.

An IDC study states that people use their mobile devices throughout their operations daily. The rapid development of mobile has created many digital marketing opportunities like SMS, emails, applications, notification, and many more; still, it is in its infancy! Nevertheless, the victory of these new edge opportunities lies in the omnipresence of media. The author says all digital marketing campaigns should use the mobile platform as a fair amount of traffic comes from mobile and supports all responsive designs for a healthier outcome. All businesses have one common intent: the hanker to grow and raise the additional yields. Unfortunately, many grapple to align their resources, processes, and technologies to achieve these goals. The author's response to the issue is – marketing automation. This digital space advancement will streamline, automate, and measure marketing tasks and workflows to boost operational efficiency and increase faster turnover. The author shares insight about designing a successful strategy to improve the process essential to every modern marketing division also throws lights on some of the misconceptions coupled with marketing automation that it is only limited to sending automated emails to save time.

Is marketing an art or science? Can it be measured or not? If you surge the marketing budget, what is the effect on the revenue? These are some fundamental questions that are covered in the concluding chapter. Moulding measurable metrics is critical to govern the campaign and to set the actions after evaluation. Jim Lenskold says, *"It is important to periodically capture a glimpse high potential impact that constantly measures results less important simply for the glory alone to make a report."* The internet has changed companies' and marketers' situation: each year, an increasing share of their budgets is devoted to it. This book can be a quick guide to understand the game of digital marketing and the opportunities it creates for all.

Book Review 02

Marketing 4.0: Moving from Traditional to Digital

(Authors: Philip Kotler, Hermawan Kartajaya and Iwan Setiawan. New Jersey: John Wiley, Year of Publication: 2016, ISBN: 9781119341208) Pages: 208, Price: \$25.00

*Sarita T Aurangabadkar**

The Book is a sequel to Marketing 3.0, which highlighted a shift from product driven marketing (1.0) to customer-centric marketing (2.0), human-centric marketing (3.0). The book is about the trends that shape the knowledge economy and further broadens the human-centric marketing to uncover every aspect of the journey that the customer takes. Marketers need to adapt to the changing customer needs and modify their plans and programs. It is a well written book, backed by research for graduate, post-graduate students, teachers and marketing management professionals. It is also available in the e-format. The content is divided into eleven chapters and comprises of 208 pages. Each chapter consists of a summary and is followed by reflection questions. Towards the end of the book glossary index is included.

The authors begin by mentioning that technology convergence will ultimately lead to the convergence between digital and conventional marketing. The more social people become, the more they want custom-made products and services. The book has three parts. The first one deals with the marketing trends of the current times, and the second one is about how can companies be effective through new frameworks in the digital economy. The last part delves into the tactical applications in the digital economy. In the prologue, the authors state the role of marketers: to guide the customers from being aware to advocacy.

Part I on Fundamental Trends Shaping Marketing consists of four chapters. The first one discusses how power is shifting to connected customers. It illustrates beautifully, how inclusion is the new business mantra, and deliberates on shift of innovation flow from vertical to horizontal. Chapter two is about the paradoxes of marketing to connected customers. The first paradox is online vs. offline; customers' expectations will be personalized touch, when buying products and services. This is even though the

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customers are technology savvy and search information through an online mode. The second paradox mentioned is informed customer versus the distracted customer; the informed customers in spite of awareness are not in control of what they want to purchase and surprisingly, rely on the opinion of others. The third paradox is negative versus positive advocacy. Connectivity facilitates voicing of opinion for the customers. Thus, many a times customers believe in advice given by perfect strangers about a product or service, rather than recommendations through celebrity brand endorsements.

In the third chapter, three influential digital subcultures -youth, women and netizens (YWN) are highlighted as the key segments in the digital era. The chapter begins by the lines, "Youth for Mind share, Women for Market Share, and Netizens for Heart Share". The fourth chapter, "Marketing 4.0 in the Digital Economy" begins with opening statement, regarding a list by McKinsey of top innovations having the most significant economic impact; namely, mobile phones, internet, automation of knowledge work. These technologies shall soon see convergence. The traditional Marketing Mix (four p's) is redefined by the authors as four c's; co-creation, currency, communal activation and conversation.

Part II on New Frameworks for Marketing in the Digital Economy has three chapters. Chapter five is about the new customer path. The conventional route was about AIDA (Attention, Interest, Desire and Action) whereas, the modification suggested by Derek Rucker was four A's (Aware, Attitude, Act and Act again). The customer path in the connectivity era is of five A's (Aware, Appeal, Ask, Act, and Advocate). The next chapter deals with Marketing Productivity Metrics. A set of new metrics purchase action ratio (PAR) and brand advocacy ratio (BAR) have been introduced to measure productivity. These aim at finding out the moving of customers from one stage to another through increase in attraction of customers towards the brand, optimizing curiosity, increasing commitment and increasing affinity.

Chapter seven is titled, "Industry Archetypes and Best Practices". It discusses the path customers take towards purchase of a product or service. Commenting on the conversion rates of customers as they move from five A's, the authors have identified four patterns across industries. The first is, "door knob", for consumer goods, which typically have pre-determined preferences, low attachment and many competing offers. The second, "gold fish", which may be seen in B-to-B context, where standard buying process with multiple stakeholder involvement exists. "Trumpet", is the third

pattern, marked by high involvement of the customer in the purchase process, with reliance on word-of-mouth and need for confidence in the quality of the offering.

Part III on Tactical Marketing Applications in the Digital Economy has four chapters. The eighth chapter is about “Human Centric Marketing for Brand Attraction”. Marketers need to increasingly embrace human centered marketing. The chapter introduces readers to digital anthropology, i.e., how humans interact, behave and use technologies. Social listening; what is said, discussed about a brand on the social media. Netnography, developed by Robert Kozinets, aims to study humans through immersion into their own natural online communities in ways which do not obstruct others. Emphatic research, requires in-person observation, brain-storming and discussions among researchers to derive better insights into the research problem. Brands should be physically attractive, intellectually compelling, socially engaging, emotionally appealing and demonstrate strong personality and morality.

Chapter nine deals with, content marketing, production of useful messages that is of value to the consumers. Eight steps are detailed namely; setting goals, mapping of audience, content ideation and planning, content creation, distribution of the content, content amplification, evaluation of the content and improving the content as required. The next chapter is about integration of traditional and digital media and experiences. Companies should aim at having a good combination of online and offline channels and see to it that the customers have a seamless experience. Three steps for an effective omni-channel marketing are given, mapping of all possible customer touch-points, identify the most critical touch points in the channel, and keep on efforts towards improving and integrating the same. The final, eleventh chapter represents Engagement Marketing, for creating lasting brand affinity. Even after the first purchase is made by the customers, it requires a series of customer engagement activities. The chapter discusses techniques that will help companies to facilitate a better experience for their customers. The three techniques are, use of mobile applications, customer relationship management application and use of gamification.

The book provides valuable insights to students and professionals into the rapidly changing Marketing environment. It helps readers to understand how customers are undergoing a change and how to give them a better and improved experience.

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