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Contents	Volume 3,Issue 1 (April, 2016)	Page No.
Research Papers and Articles	Dual Secured Data Transmission using Armstrong Number and Color Coding Vaibhav Kant Singh	01 - 09
	Nano Technology in Food Processing: An Overview Onu John Chigbo	10 - 24
	Implications of Non-Financial Performance Measures in Indian Banks Chand Tandon, Sonali Agarwal	25 - 40
	Support of International Accounting Standard in Business Management Dr. Mona Tanna, Vipin Thareja	41 - 50
	Effect of Credit Risk on the Performance of Nepalese Commercial Banks Yuga Raj Bhattarai	51 - 70
	A Study of the Prevalent Employee Engagement Models in the Industry Nidhi Arora, Dr. Vijay Dhole	71 - 83
	Changing Consumer Trends in Rural India: Perspectives, Practices and Prospects Jyoti Kukreja	84 - 92
Cases	Winds of Change: A Case Study Dr.B .N. Balaji Singh,Ravi.K.R, Brijesh Singh	93 - 107
Index of Articles	Based on PIMR Library	108 - 159

Editorial Board

Technical Board

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DUAL SECURED DATA TRANSMISSION USING ARMSTRONG NUMBER AND COLOR CODING

Vaibhav Kant Singh*

With the advent and evolution of Computing and Internet technology, there is a drastic change in the general manner communication between individuals. Today people use technology for doing almost all basic things. All individuals with the wide usage of mobile phones (Specifically Smart Phones) are able to communicate with each other. Smart phones enable user to use internet facility very easily, also with the facility of hotspot connection which could be made with laptop, the usage is easy and useful. Internet gave platform for the user to do a variety of actions like shopping, getting information about various aspects, booking tickets, chatting etc. While doing all these actions using internet, various personal information of the sender is exposed to the intruders sitting in the internetwork. These intruders use the private pieces of information like internet banking password of Individuals (which might be exposed during internet shopping) for taking advantage. There are several approaches which are currently running to have protection against these intruders. New mechanisms for making the internet communication secure are always a potential area for research. In this paper the author proposed a dual secured data transmission mechanism for protecting the data from being identified by the intruder. In the proposed method, at first level a color code is used by the sender for authentication and in the second level Armstrong number is used for encryption. Armstrong number used for encryption is a nice technique for providing security. How encryption using Armstrong number is going to take place is discussed in the paper by the author. The data received at the receiver end whether by the intruder or by the authorized receiver, could be retrieved only if the receiver is able to enter the password to the application which the sender has set. The password is a combination of color, set from the color palette available in the communication application. The cracking of the color code set as password for reading data is a tough task. Application for performing the task is implemented and discussed in the paper.

Keywords: Armstrong Number, Intruder, Security, Encryption, Decryption.

*Department of Computer Science and Engineering, Institute of Technology, Guru Ghasidas Vishwavidyalaya, Central University Bilaspur, Chhattisgarh, India,

INTRODUCTION

With the advent of computing technology the processing of data and data communication has reached a great level. The cost of hardware in terms of capability to perform tasks is decreasing day by day. This has aroused a situation where more and more people are involved in adopting computing technology as a medium to deliver their useful data processing task. In computing technology, software development is a very major field. To meet the competitive demands of the users the software developers are engaged in making good quality software that can satisfy the user. The Software that is delivered to the customer should satisfy some set of quality measures like:-

1. Integrity
2. Correctness
3. Portability
4. Openness and Interoperability
5. Security
6. Maintainability
7. Reusability etc.

Software which is going to be delivered to the customer is going to be checked for the above evaluation measures. In the paper, the author is making a focus on security a very important aspect in the current scenario.

Problem Statement

The software that is delivered to the customer must meet the security constraint. Thus providing security to the software from unauthorized access is the motive of the work. In this paper we will lay focus on the way that could be adopted by the developer to ensure security in the internet for the application developed by them.

REVIEW OF LITERATURE

Singh et al. (2015) had discussed fraud detection in cloud framework. Singh et al. (2010) had proposed data-mining a step in the KDD process as an efficient technique for detecting fraud in the digital data on the basis of the survey made on the subject. Singh and Singh (2010) proposed a dual digital marking system for providing security in data transmission. Singh and Singh (2015a) proposed color coding mechanism for providing security over the Internet. Singh and Singh (2015b) proposed dual level digital signature for providing security.

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Proposed Work

The method proposed is going to provide two level security to the transmitted data. In the first level we will implement the use of color code for authentication purpose. If the person in the destination machine is having the information of the color code set as password then only he will be able to open the documentation. Beside to the first level security implemented by means of authentication the second level security may be implemented by means of encryption through ARMSTRONG color coding technique.

Encryption Process [Source Machine]
PHASE-1

The person who is sending message is going to set a password i.e. color oriented a combination of red, green and blue. The values of each are going to range in between 0-255. A number of color combinations could be made of this. Only the Person who is sending and who is going to receive the message is going to have knowledge about the combination. Thus, it is hard to crack.

PHASE-2
Suppose the message to be encrypted is “VAIBHAV SINGH”

The procedure to be adopted is as follows:-

Step1:-MESSAGE:”V A I B H A V S I N G H”   **ARMSTRONG number:** 371

Message	V	A	I	B	H	A	V	S	I	N	G	H
ASCII Code (x)	86	65	73	66	72	65	86	83	73	78	71	72
Armstrong Number (y)	3	7	1	9	49	1	27	343	1	3	7	1

First Step Encrypted Message W =(x+ y)	89	72	74	75	121	66	113	426	74	81	78	73

Step2:-The encrypted message is put into 3x4 matrix named “A” as represented below:-

$$A = \begin{bmatrix} 89 & 75 & 113 & 81 \\ 72 & 121 & 426 & 78 \\ 74 & 66 & 74 & 73 \end{bmatrix}$$

Step3:- ARMSTRONG number taken represented in form of MATRIX “B” of 3x3 form

$$B = \begin{bmatrix} 3 & 7 & 1 \\ 9 & 49 & 1 \\ 27 & 343 & 1 \end{bmatrix}$$

Step4:- Cipher text produced in the source machine to be sent to the destination machine is represented by Matrix “C” $Cipher\ Text\ (C) = B \times A$

$$C = \begin{bmatrix} 845 & 1138 & 3395 & 862 \\ 4403 & 6670 & 21965 & 4624 \\ 27173 & 43594 & 149243 & 29014 \end{bmatrix}$$

Step5:- Final Encrypted Message is:

$$[845 \quad 4403 \quad 27173 \quad 1138 \quad 6670 \quad 43594 \quad 3395 \quad 21965 \quad 149243 \quad 862 \quad 4624 \quad 29014]$$

Decryption Process [Destination Machine]:

Phase1:

Phase2:

Step1: Generate of Matrix “D” as Follows

$$D = B^{-1}$$

Since,

$$B^{-1} = \frac{Adj\ of\ (B)}{|B|}$$

$$Adj\ of\ (B) = [Cofactor\ of\ (B)]^T$$

$$Cofactor\ of\ (B) = \begin{bmatrix} +\begin{vmatrix} 49 & 1 \\ 343 & 1 \end{vmatrix} & -\begin{vmatrix} 9 & 1 \\ 27 & 1 \end{vmatrix} & +\begin{vmatrix} 9 & 49 \\ 27 & 343 \end{vmatrix} \\ -\begin{vmatrix} 7 & 1 \\ 343 & 1 \end{vmatrix} & +\begin{vmatrix} 3 & 1 \\ 27 & 1 \end{vmatrix} & -\begin{vmatrix} 3 & 7 \\ 27 & 343 \end{vmatrix} \\ +\begin{vmatrix} 7 & 1 \\ 49 & 1 \end{vmatrix} & -\begin{vmatrix} 3 & 1 \\ 9 & 1 \end{vmatrix} & +\begin{vmatrix} 3 & 7 \\ 9 & 49 \end{vmatrix} \end{bmatrix}$$

$$Cofactor\ of\ (B) = \begin{bmatrix} -294 & +18 & +1764 \\ +336 & -24 & -840 \\ -42 & +6 & +84 \end{bmatrix}$$

$$[Cofactor\ of\ (B)]^T = \begin{bmatrix} -294 & 336 & -42 \\ +18 & -24 & +6 \\ 1764 & -840 & +84 \end{bmatrix}$$

$$Adj\ of\ (B) = [Cofactor\ of\ (B)]^T$$

$$B^{-1} = \frac{Adj\ of\ (B)}{|B|}$$

Now Since,

$$B = \begin{bmatrix} 3 & 7 & 1 \\ 9 & 49 & 1 \\ 27 & 343 & 1 \end{bmatrix}$$

Therefore,

$$|B| = 1008$$

Putting the value of $|B|$ and $Adj\ of\ (B)$in the Equation for B^{-1}we get

$$B^{-1} = \frac{1}{1008}\begin{bmatrix} -294 & 336 & -42 \\ +18 & -24 & +6 \\ 1764 & -840 & +84 \end{bmatrix}$$

Therefore Matrix D is a Follows

$$D = B^{-1} = \begin{bmatrix} \frac{-7}{24} & \frac{1}{3} & \frac{-1}{24} \\ \frac{1}{56} & \frac{-1}{42} & \frac{1}{168} \\ \frac{7}{4} & \frac{-5}{6} & \frac{1}{12} \end{bmatrix}$$

Step2:- Decrypted message will evaluated for the Matrix D as Follows:

$$Decrypted\ Message = D \times C$$

$$\boldsymbol{D} \times \boldsymbol{C} = \begin{bmatrix} \frac{-7}{24} & \frac{1}{3} & \frac{-1}{24} \\ \frac{1}{56} & \frac{-1}{42} & \frac{1}{168} \\ \frac{7}{4} & \frac{-5}{6} & \frac{1}{12} \end{bmatrix} \times \begin{bmatrix} 845 & 1138 & 3395 & 862 \\ 4403 & 6670 & 21965 & 4624 \\ 27173 & 43594 & 149243 & 29014 \end{bmatrix}$$

$$Decrypted\ Matrix\ X^C = \begin{bmatrix} 89 & 75 & 113 & 81 \\ 72 & 121 & 426 & 78 \\ 74 & 66 & 74 & 73 \end{bmatrix}$$

Step3: Converting the value of Matrix X^C in decrypted message

Decrypted Code from Matrix X^C	89	72	74	75`	121	66	113	426	74	81	78	73
Armstrong Number (y)	3	7	1	9	49	1	27	343	1	3	7	1
Decrypted Original Message W=(x^c-y)	86	65	73	66	72	65	86	83	73	78	71	72
Equivalent ASCII Code	V	A	I	B	H	A	V	S	I	N	G	H

IMPLEMENTATION

In Phase-1 the palette of colors is used to select a password for the document/message to be sent. The combination of Red, Green and Blue makes up a color which will be used for authentication. The first level security is enabled through this mechanism. Each color is going to have a numeric value that ranges from 0 to 255. The combination of values of Red, Green and Blue is going to generate a value which will be password for the destination computer. Thus in Phase-1 security is provided through password which is a strong mechanism hard to crack. The palette scheme used for selection of color is represented below. Phase-1 will be followed by Phase-2 of encryption.

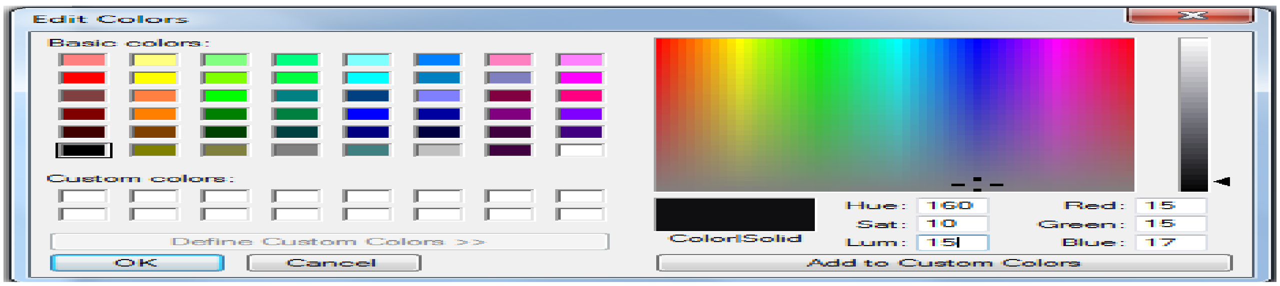

Figure1: Palette Scheme for Selecting Color Password

The implementation of Phase-2 i.e. ARMSTRONG number implementation is made in Java. The screen shot of Java implementation and output of the code is shown in figure 2.

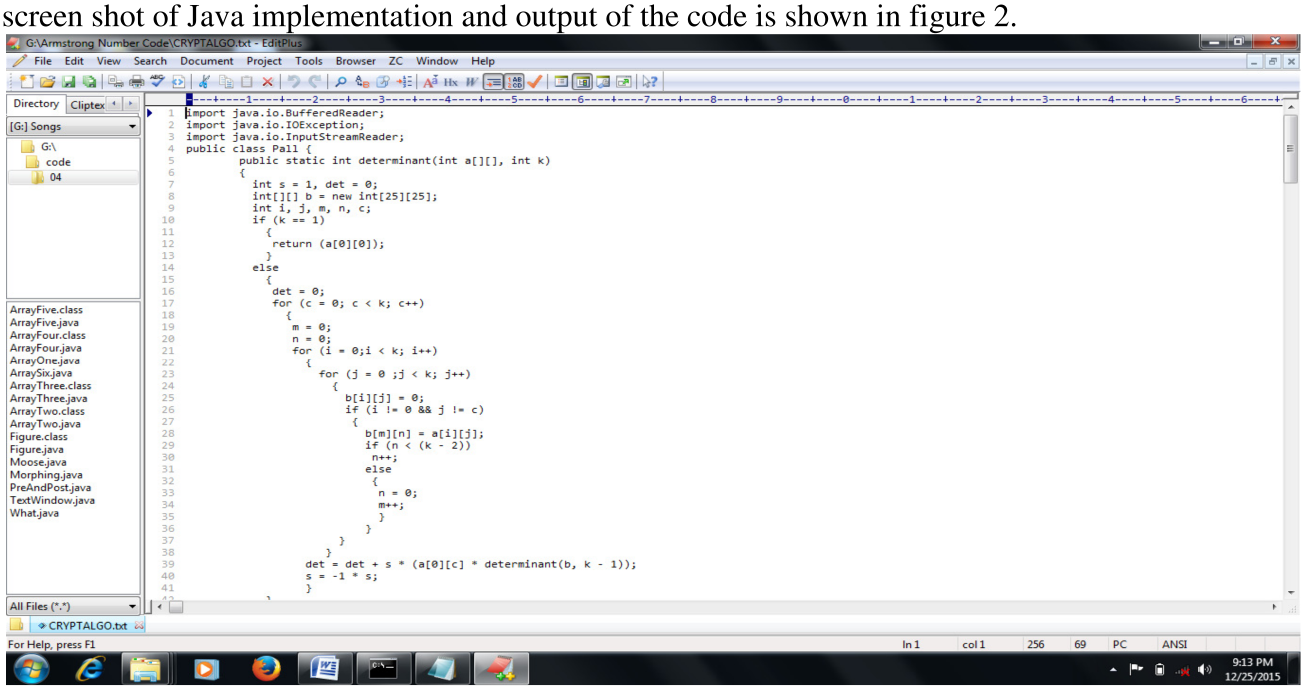

Figure 2: Implementation of ARMSTRONG Number Code

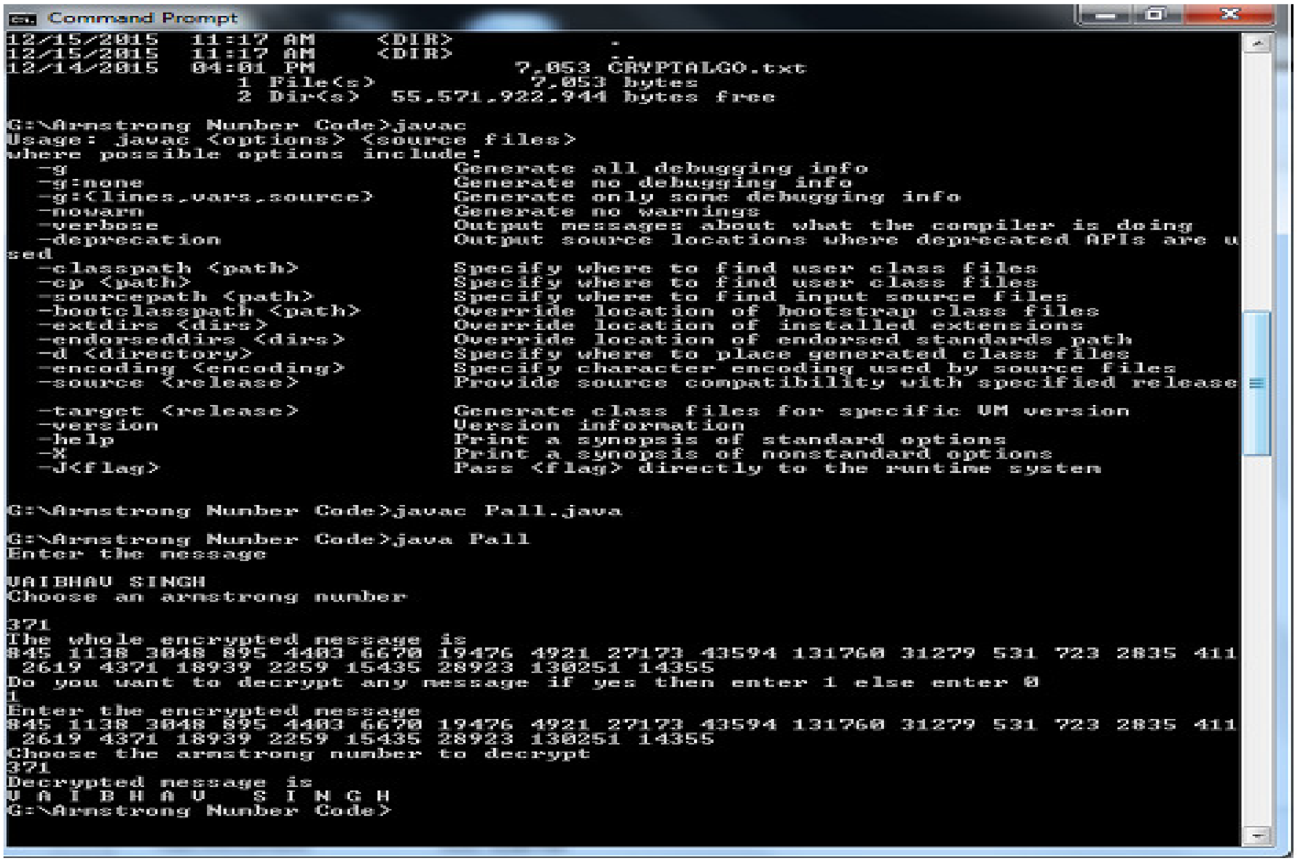

Figure 3: ARMSTRONG Code output implemented in Java

CONCLUSION

The proposed algorithm is a useful method to enable security for the data being transmitted over the network. The color coding technique used as password for providing authentication in Phase-1 is a useful method for providing first level security. Color coding technique is a good mechanism for setting password. Also, the second level security provided through ARMSTRONG number is also a very useful method for finding security to the network data. ARMSTRONG number of Phase-2 suffers from various limitations like there are some cases where the value becomes zero during the process of the calculation and leads to undeterminable result. Also password setting of color also has a range of values which can be cracked by an efficient hacker, who is able to identify that color values are taken as password.

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NANO TECHNOLOGY IN FOOD PROCESSING: AN OVERVIEW

Onu John Chigbo*

Over the past few decades, the evaluation of a number of science disciplines and technologies have revolutionized food and dairy processing sector. Most notable among these are biotechnology, information technology etc. Recently "Nanotechnology", an essentially modern scientific field that is constantly evolving as a broad area of research, with respect to dairy and food processing, preservation, packaging and development of functional foods. Food and dairy manufacturers, agricultural producers, and consumers could gain a more competitive position through nanotechnology. Furthermore, the delivery of bioactive compounds for nutritional as well as development of functional food are possible through this technology. Nanotechnology will replace many fields with tremendous application potential in the area of dairy and food sectors. Several critical challenges, including discovering of beneficial compounds, establishing optimal intake levels, developing adequate food delivering matrix and product formulation including the safety of the products need to be addressed. And, also the potential negative effects of nanotechnology- based delivery systems on human health need to be considered.

Key Words: Nanotechnology, Food processing, Challenges.

* Department of Agricultural Engineering, Federal Polytechnic Oko, Anambra State

INTRODUCTION

In today's competitive market new frontier technology is essential to keep leadership in the food and food processing industry. Consumers demand fresh, authentic, convenient and flavorful food products. The future belongs to new products and new processes, with the goal of enhancing the performance of the product, prolonging the shelf life, freshness, improving the safety and quality of food product. Nanotechnology has the potential to revolutionize the food and dairy processing sectors. Nanotechnology is based on the prefix "nano", a Greek word meaning "dwarf". According to Pehanich (2006), nanotechnology is the understanding and control of matter at dimensions of roughly 1 to 100 nanometers. To be more specific, nanotechnology is defined as the design, production and application of structures, devices, and systems through control of the size and shape of the material at the nanometer (10-9 of a meter) scale where unique phenomenon enable novel applications (Ravichandran et al., 2006; National Nanotechnology Initiative, 2006). This technology has already revolutionized the health care, textile, information technology, and energy sectors etc. and has been well publicized (Kumar and Rai, 2009). Several products enabled by nanotechnology are already in the market, such as antibacterial dressings, transparent sunscreen lotions, light-diffracting cosmetics, penetration enhanced moisturizers, stain and odour repellent fabrics, scratch free paints for cars, and self cleaning windows, dirt repellent coatings, long lasting paints and furniture varnishes, and even some food products (Miller, 2008).Nanotechnology has been described as the new industrial revolution and both developed and developing countries are investing more in this technology. Recently the Helmuth Kaiser Consultancy predicted that the nano food market will surge from 2.6 billion USD to 20.4billion USD by 2010 and is extended to grow to $30.4billion in 2015. The government of India established the Nano-science and technology initiative in the later part of the 2001 through Department of Science and Technology (DST), New Delhi and invested about Rs. 350 Crores (2002-06) and granted approval for the nano mission worth Rs. 1000 crores for next five years (Patra *et al.,* 2009). Nanotechnology can be applied by two different approaches either "bottom up" or "top down". in food and dairy processing (Ravichandran, 2010). The top down approach involves a physical processing of the food materials, such as dry-milling of wheat into fine flour that has a high water-binding capacity. The antioxidant activity in green tea powder is improved by when the size of the powder is reduced to 1000 nm, the digestion and absorption resulted in an increase in the activity of an oxygen-eliminating enzyme (Shibata, 2002). By contrast, self-assembly and self-organization are concepts derived from biology that have inspired a bottom-up food nanotechnology. For example, self-assembly structures through organization of casein micelles or starch and the folding of globular proteins and protein aggregates which create stable entities to form nanometer scale via self organization (Dickinson and Van Vliet, 2003).

In food and dairy industries, the applications of nanotechnology include nano particulate Delivery Systems (nano dispersions and nano capsules), Packaging (nano laminates, nano composites bottles, bins with silver nano particles), Food Safety and Biosecurity (nano sensors) etc. (Chen *et al.* 2006). The nano technology will play an vital role in the food and dairy processing in near future and would involve two forms of nano food applications viz, food additives (nano inside) and food packaging (nano outside). The nano scale food additives may be used to influence texture, flavour, nutritious improvement, provide functionally and even detect pathogens and food packaging involves extend food shelf life, edible, nano wrapper which will envelope foods, preventing gas and moisture exchange, ‘smart’ packaging (containing nano-sensors and anti-microbial activators) for detecting food spoilage and releasing nano-anti-microbes to extend food shelf life (Richardson and Piehowski, 2008; Miller, 2008).

Nanotechnology in Food and Dairy Processing

Cell membranes, harmones, DNA etc. that exist in nature are example of nano structures and the food molecules, proteins, fats, carbohydrates etc. are not exceptional and the results of nano scale level murges between sugars, fatty acids and amino acids (Powell and Colin, 2008).'Nano foods' from the Helmut Kaiser Consultancy (2009) estimates an increasing growth in the development of food and dairy related nano products and patent applications. Nanotechnology can be applied to develop nano scale materials, controlled delivery systems, contaminant detection and to create nano devices for molecular and cellular biology from how food is grown to how it is packaged. The application of nano technology with respect to food and dairy industry will be covered under two major heads viz. food additives (nano inside)and food and dairy packaging (nano outside).

Food Additives (Nano Inside): Nano-dispersions and Nano-capsules

Functional ingredients (for example, drugs, vitamins, antimicrobials, antioxidants, flavorings, colorants, and preservatives etc.) comes in different molecular and physical forms such as polarities (polar, non polar, amphiphilic), molecular weights (low to high), and physical states (solid, liquid, gas). These ingredients are rarely utilized directly in their pure form; instead, they are often incorporated into some form of delivery system. Weiss *et al.* (2006) examined that a delivery system must perform a number of different roles. First, it serves as a vehicle for carrying the functional ingredient to the desired site of action. Second, it may have to protect the functional ingredient from chemical or biological degradation (for example, oxidation) during processing, storage, and utilization; this maintains the functional ingredient in its active state. Third, it may have to be capable of controlling the release of the functional ingredient, such as the release rate or the specific environmental conditions that trigger release (for example, pH, ionic strength, or temperature). Fourth, the delivery system has to be compatible with the other components in the system, as well as being compatible with the physicochemical and qualitative attributes (appearance, texture, taste, and shelf-life) of the final product. In order to achieve above said objectives, a number of potential delivery systems based on nanotechnology could be used as association colloids, bio-polymeric nano-particles and nano-emulsion.

Association colloids

A colloid is a stable system of a substance containing small particles dispersed throughout. An association colloid is a colloid whose particles are made up of even smaller molecules. Surfactant micelles, vesicles, bilayers, reverse micelles, and liquid crystals are some examples of association colloids which have been used to encapsulate and deliver polar, non polar, and amphiphilic functional ingredients (Flanagan and Singh, 2006; Golding and Sein, 2004). The dimensions of many association colloids are in the range of 5 to 100 nm, and these structures are therefore considered to be nano particles.

Nano fibers

Nano fibers with diameters from 10 to 1000 nm, makes them ideal for serving as a platform for bacterial cultures as well as structural matrix for artificial foods. Since nano fibers are usually not composed of food grade substances, they have only a few potentialapplications in the food industry (Weiss *et al.*, 2006).Electro-spinning is a manufacturing technology capable of producing thin, solid polymer strands (nanofiberes) from solution by applying a strong electric field to a spinneret with a small capillary orifice. The food industry can use electro spun microfibers in several ways such as a building/reinforcement element of composite green (that is, environmentally friendly) food packaging material, as building elements of the food matrix for imitation/artificial foods, and as nano structured and micro structured scaffolding for bacterial cultures.

Though the electro spun fibers application is increasing, its use in food and dairy processing are relatively few and are made primarily from synthetic polymers. As progress in the production of nano fibers from food biopolymers is made, the use of biopolymeric nano fibers in the food industry will increase(Ravichandran, 2010).

Nano-tubes

Carbon nano-tubes have been used nonfood application. The structures have been used as low resistance conductors or catalytic reaction vessels among other uses. Graveland-Bikker and Kruif (2006), have reported that certain globular proteins from milk (such ashydrolyzed α-lactalbumin) can be made to self assemble to form nano-tubes under appropriate conditions. This technique is applicable to other proteins as well and has been explored to assist in the immobilization of enzymes or to build analogues to muscle-fiber structures. Nano-tubes made of the milk protein α -lactalbumin are formed by self-assembly of the partially hydrolysed molecule (Graveland-Bikker *et al.* 2006). Otte *et al*.(2005) examined that at neutral pH and in presence of an appropriate cation, these building blocks self-assemble to form micro meter long tubes with a diameter of only 20nm. The minimum concentration to form nanotubes of α-lactalbumin is 20 g/l. The α-lactalbumin nano-tubes could withstand conditions similar to a pasteurization step(72ºC/40s). According to Gouin (2004), the features of the α-lactalbumin nano-tube makes it an interesting potential encapsulating agent. Because α-lactalbumin is a milk protein it will be fairly easy to apply the nano-tubes in foods or pharmaceutics. These nanostructures promise various applications in food, nano medicine etc.(Rajagopal and Schneider, 2004). In general protein hydrolysis increases the digestibility of protein. Furthermore α -lactalbumin has important nutritional value. A nanotube made by food /dairy proteins or their derivatives have so far only been reported for α lactalbumin.

Nano-capsules

A number of new processes and materials derived from nanotechnology have the potential to provide new solutions to dairy and food processing fronts. In recent years, there has been considerableinterest in exploring the potential of nanotechnology in encapsulation and delivery of biologically active substances into targeted tissues, enhance the flavour andother sensory characteristics of food and dairy products. Casein micelle (CM) plays a role as natural nano-capsular vehicle for nutraceuticals. The CM is important due to their biological activity, good digestibility. The micelles are very stable to processing and retain their basic structural identity through most of these processes(Gouin, 2004).Uricanu *et al.* (2004) reported that casein micelles (CM) are in effect nano-capsules created by nature to deliver nutrients such as calcium phosphate and protein to the neonate. A novel approach is to harness CM for nano-encapsulation and stabilization of hydrophobic nutraceutical substances for enrichment of non-fat or low-fat food products. Such nano-capsules may be incorporated in dairy products without modifying their sensory properties. The general approach is to develop nano sized carriers or nano sized materials, in order to improve the absorption and, hence, potentially the bioavailability of added materials such as vitamins, phytochemicals, nutrients, or minerals. The materials can be incorporated into solid foods, delivered as liquids in drinks, or even sprayed directly on to mucosal surfaces.

Food 'fortification' through Nanotechnology

Nanotech companies are trying to fortify processed dairy and food products with nano encapsulated nutrients, their appearance and taste boosted by nano-developed colours, their fat and sugar content removed or disabled by nano-modification, and 'mouthfeel' improved. Food 'fortification' will be used to increase the nutritional claims for example the inclusion of 'medically beneficial' nano-capsules will soon enable chocolate chip cookies or hot chips to be marketed as health promoting or artery cleansing. Nano technology will also enable junk foods like ice cream and chocolate to be modified to reduce the amount of fats and sugars that the body can absorb. This is possible by using nano particles to prevent the body from digesting or absorbing these components of the food. In this way, the nano industry could market vitamin and fibre-fortified, fat and sugar-blocked junk food as health promoting and weight reducing (Miller, 2008).

Nanostructures and Nanoparticals in Food

Most polysaccharides and lipids are linear polymers with thicknesses less than nanometers, while food proteins are often globular structures (1-10 nm) in size. The functionality of many raw materials and the processing of foods arise from the presence, modification, and generation of forms of self-assembled nano structures (Chen *et al.* 2006). The crystalline structures in starch, and processed starch-based foods that determine gelatinization and influence the nutritional benefits during digestion, the fibrous structures that control the melting, setting, and texture of gels, and the two dimensional(2D) nanostructure formed at oil-water and air-water interfaces that control the stability of food/dairy foams and emulsions (Rudolph, 2004).For example, the creation of foams (e.g., the head on a glass of beer) or emulsions (e.g., sauces, creams, yoghurts, butter, and margarine) involves generating gas bubbles, or droplets of fat or oil, in a liquid medium. This requires the production of air water or oil-water interface and the molecules present at this interface determine its stability. These structures are one molecule thick and are examples of two dimensional nanostructures. A source of instability in most foods is the presence of mixtures of proteins and other small molecules such as surfactants (soap-like molecules or lipids) at the interface (Morris, 2005). Atomic Force Microscopy has allowed to visualized and understand these interactions and to improve the stability of the protein networks that can be simultaneously applied widely in the dairy, baking and brewing industries. The knowledge gained in the nanotechnology in the field of medicine , electronics etc. could be adapted in the field of food and dairy processing, more specifically in food safety (e.g., detecting pesticides and microorganisms), in environmental protection (e.g., water purification), and in delivery of nutrients (Roco, 2003;Chau, 2007) The area that has led to most debate on nanotechnology and food is the incidental or deliberate introduction of manufactured nano particles into food materials.

Food Packaging (Nano Outside)

Customers today demand a lot more from packaging in terms of protecting the quality, freshness and safety of foods and the nanotechnology, which uses microscopic particles, is effective and affordable and will bring out suitable food and dairy packaging in the near future (El Amin, 2006).Food packaging is considered to be one of the earliest commercial applications of nanotechnology in the food sector. Reynolds (2007) reported that about 400-500nano-packaging products are estimated to be in commercial use, while nanotechnology is predicted to be used in the manufacture of 25% of all food packaging within the next decade. The significant purpose of nano-packaging is to set longer shelf life by improving the barrier properties of food packaging to reduce gas and moisture exchange and UV light exposure (Sorrentino *et al.* 2007). For example, Du Pont has announced the release of a nano-titanium dioxide plastic additive namely "DuPont lightstabilizer210", which could reduce UV damage of foods in transparent packaging (El Amin, 2007).By 2003, over 90% of nano-packaging was based on nano composites, in which nano materials were used to improve the barrier properties of plastic wrapping for foods and dairy products. Nano-packaging can also bedesigned to release antimicrobials, antioxidants, enzymes, flavours and nutra cuticles to extend shelf life (Cha and Chinnan, 2004). El Amin (2005) reported that exciting new nanotechnology products for food packaging are in the pipeline and some anti-microbial films, have already entered the market to improve the shelf life of food and dairy products. Furthermore, nano materials are being developed with enhanced mechanical and thermal properties to ensure better protection of foods from external mechanical, thermal, chemical or micro biological effects with an addition level of safety and functionality. A scientific group at the Norwegian Institute of Technology is using nanotechnology to create tiny particles in the film, to improve the transportation of some gases through the plastic films to pump out unwanted carbon dioxide that would shorten the shelf life of the foods. They are also looking at whether the film could also provide barrier protection and prevent gases such as oxygen and ethylene from deteriorating foods (SINTEF, 2004).

Nano-Coatings

Waxy coating is used widely for some foods such as apples and cheeses. Recently, nanotechnology has enabled the development of nano scale edible coatings as thin as 5 nm wide, which are invisible to the human eye. Edible coatings and films are currently used on a wide variety of foods, including fruits, vegetables, meats, chocolate, cheese, candies, bakery products, and French fries (Morillon *et al.* 2002; Cagri *et al.* 2004; Rhim 2004).These coatings or films could serve as moisture, lipid, and gas barriers. Alternatively, they could improve the textural properties of foods or serve as carriers of functional agents such as colors, flavors, antioxidants, nutrients, and antimicrobials and could also increase the shelf life of manufactured foods, even after the packaging is opened. The U.S. Company Sono-Tec Corporation announced in early 2007 that it has developed an edible antibacterial nano-coating, which can be applied directly to bakery goods (El Amin, 2007).

Nanolaminates

Nanotechnology provides food scientists with a number of ways to create novel laminate films suitable for use in the food and dairy industry. A nano laminate consists of 2 or more layers of materials with nano meter dimensions that are physically or chemically bonded to each other. According to Decher and Schlenoff (2003), one of the most powerful methods is based on the LbL deposition technique, in which the charged surfaces are coated with interfacial films consisting of multiple nanolayers of different materials. Weiss *et al.* (2006) reported that nanolaminates offer some advantages for the preparation of edible coatings and films over conventional technologies and may thus have a number of important applications within the food and dairy industry. A variety of different adsorbing substances could be used to create the different layers, including natural polyelectrolytes (proteins, polysaccharides), charged lipids (phospholipids, surfactants), and colloidal particles (micelles, vesicles, droplets). It would be possible to incorporate active functional agents such as antimicrobials, antibrowning agents, antioxidants, enzymes, flavors, and colors into the films. These functional agents would increase the shelf life and quality of coated foods. These nano laminated coatings could be created entirely from food-grade ingredients (proteins, polysaccharides, lipids) by using simple processing operations such as dipping and washing.

Nanotechnology and food safety

Food safety means that all food products must be protected from chemical, biological, physical and radiation contamination through processing, handling and distribution. So far the present review has focused on the application of nanotechnology in the dairy and food processing including packaging.

The nanotechnology has brought revolution in the non-food sectors; however, it is slowly gaining popularity in the dairy and food processing. Although consumers are thrilled at the exciting food and dairy products emerging through the application of nanotechnology, there is a serious question about safety and will requiring attention by the industry as well as the policy makers. It is important to note that nanomaterials (increased contact surface area), might have toxic effects in the body that are not apparent in the bulk materials (Dowling, 2004). Despite the lack of regulation and risk knowledge, a wide variety of food and nutrition products containing nano scale additives arealready in the market (e.g. iron in nutritional drink mixes, micelles that carry vitamins, minerals, and phytochemicals in oil, and zinc oxide in breakfast cereals etc.) and nanoclays incorporated in plastic beer bottles. The additives universally accepted as GRAS will have to be reexamined when used at nanoscale level. The nanoparticles are more reactive, more mobile, and likely to be more toxic. This toxicity is one of the important issues must be addressed. There is strong possibility that nanoparticles in the body can result in increased oxidative stress that, in turn, can generate free radicals, leading to DNA mutation, cancer, and possible fatality. It is also not fully understood whether enhancing the bioavailability of certain nutrients or food additives might negatively affect human health (Moraru *etal.*,2003). The ingredients in these nanoparticles must undergo a full safety assessment by the relevant scientific advisory association before these are permitted to be used in the dairy and food products including packaging(U.K.RS/RAE, 2004).

Regulation of nanotechnologies to ensure food safety

The health implications of food processing techniques that produce nanoparticles and nano scale emulsions also warrant the attention of food regulations. The potential for such foods to pose new health risks must be investigated in order to determine whether or not related new food safety standards are required (Bowmanand Hodge, 2007). The European Union regulations for food and food packaging have recommended that for the introduction of new nanotechnology, specific safety standards and testing procedures are required (Halliday,2007). In the United States, nanofoods and most of the food packaging are regulated by the United States Food and Drug Administration (US FDA) (Badgley *et al.*2007), while in Australia, nanofood additives and ingredients are regulated by Food Standards Australia and New Zealand (FSANZ), under the Food Standards Code(Bowman and Hodge, 2006).There is an urgent need for a common regulatory system capable of managing any risks associated with nano foods and the use of nanotechnologies in dairy and food industry. Governments must also respond to nanotechnology's broader social, economic, civil liberties and ethical challenges. To ensure democratic control of these new technologies in the important area of food and dairy, public involvement in nanotechnology decision making is essential (U.K.RS/RAE, 2004).

CONCLUSION

The prediction is that nanotechnology will transform the entire food and dairy industry near future. Nanotechnology has already entered into food and dairy industries, research facilities are established, potential applications are under study. Although only a handful of nano food products are now available in the market, the tremendous potential will attract more and more competitors in this field. However, there are few issues, particularly regarding the accidental or deliberate use of nano particles in food, or food-contact materials, that consumers are concerned about the potential negative effects of nanotechnology-based delivery systems on human health and also regulatory stands. Several critical challenges, including discovering of beneficial compounds, establishing optimal intake levels, developing adequate food delivering matrix, product formulations and safety of the products need to bead dressed. Irradiation technology took more than 5decades of research and safety assessment for its acceptance in food and dairy processing. Nanotechnology also will have to wait till all safety issues are resolved. There is an urgent need for regulation of nanomaterials before their incorporation into food and dairy processing including packaging. Nanomaterials must not cause any health risks for consumers or to the environment. More research studies are required to investigate the hazards of nanomaterials, taking the size as a main factor even though some of the chemical materials in the form of large particles are safer than when they are in the nano state.

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IMPLICATIONS OF NON-FINANCIAL PERFORMANCE MEASURES IN INDIAN BANKS

Chand Tandon*

Sonali Agarwal**

The inadequacies of conventional management accounting (MA) information point out a need for management to locate correct measuring gear for budding non-financial performance (NFP) in the exceedingly aggressive financial services, as well as in the manufacturing industry. Thus, the conduct of MA in measuring the performances of budding NFP has been in receipt of augmented emphasis in the increasingly important service industries. Bearing in mind the shortcoming of the conventional MA information system, predominantly the measurement of novel emerging NFPs, this empirical research is an effort in the direction of investigating the role of MA in non-financial as well as financial performance measurement (PM) in chosen banks and financial institutions (BFIs) in India. The study demonstrates that the function of MA in non-financial PM is not important. However; management is paying more notice to its measurement. This study identifies three different aspects of NFP: profit-driven NFP; NFP for long-term spirited advantage; and independent NFP (those not linked with the profitability of an organization).

Key Words: Service Industries; Performance Measurement; Management Accounting; Banking.

*Associate professor, New Delhi Institute of Management, Delhi
** Research Scholar, Jamia Hamdard University, Delhi

INTRODUCTION

The shortcomings of conventional management accounting (MA) information, and the need for further study of its practical role in both manufacturing and services, have been talked and researched by many well-known scholars (Scapens, 1990; Kaplan, 1984 among others). A call for multi-dimensional performance measurement (PM) has been established as a result of several studies by contemporary MA scholars (Kaplan and Norton, 1992, 1996; Fitzgerald *et al*., 1991; Nanni *et al*., 1990; Govindarajan and Shank, 1992; Otley, 1999).

In recent years, non-financial PM has received substantial consideration from MA scholars, and there have been quite a few studies with the intention to deal with NFP measures. Prominent among these studies have been those of Scapens (1997), Simons (1990), Hoque and James (2000), Abernethy and Lillis (1995), Ittner *et al*. (1997), Armitage and Atkinson (1990), Ezzamel (1992), and Turney (1991). A lot of of these researchers talked about the subject of performance measures in manufacturing industries, but a small number of studies have been dedicated to service industries. Distinguished exceptions include Smith (1998), Fitzgerald *et al*. (1991), Ballantine *et al*. (1998), Brignall (1997), Evans *et al*. (1997), and Silvestro *et al*. (1992).

Fitzgerald *et al*. (1991) have argued that PM is an input issue in ensuring the winning completion of a company's strategies and techniques in chase of its goals, and in ensuring the achievement of a business organization in both the short term and the long term. In the short term, financial performance measures unswervingly connected to profitability (such as return on investment and earning per share). However, in terms of long-term profitability, the intangibles that guide to profit over time assume better importance – counting such non-financial factors as customer approval quality, and so on. In lots of cases, such factors might be measured "non-financial" in the short term, but are taken to be "financial" in the longer term. From the normative point of view, it might be said that they are "non-financial", but if so-called "non-financial" performance factors are scrutinized absolutely over a dissimilar time horizon, by way of few exceptions they are seen to be important in overall long-term profitability.

Kaplan and Norton (1996) recognized this realism by giving an example:One organization now considers its scorecard measures to contact the collision of each possible investment. A relative weighting is recognized for the measures, giving important stress to financial measures, such as return-on-capital and profitability, but also to the drivers of future financial performance, such as quality, service, and customer retention. They exposed an entire succession of linkage in overall financial performance. For example, employee morale increases customer satisfaction and this, in turn, leads to elevated return on capital because such employees produce pleased and loyal customers, and having such customers, in turn, drives financial performance. In this case, the elements in the service profit chain can thus be articulated. To appreciate the position of MA in measuring NFP, it is essential to recognize and classify NFP according to the wider objectives, strategies, and techniques of a business organization. Management must believe performance measurement in terms of long-term competitive advantages (LTCA) and not necessarily in terms of the short-term profitability of the organization.

OBJECTIVES

Performance measurement is in receipt of a higher emphasis in service organizations as well as in manufacturing organizations. Though a great deal has been written about the requirement for correct performance measures, and there have been quite a few studies dealing with NFP measures, reasonably little is known about the role of MA in the measurement of NFP in practice. Against that background, this paper investigated the role of MA in measuring NFP in the competitive Indian financial market. In this study of how MA systems are used to measure performance in the financial sector, answers to the following questions were investigated:

- What methods or systems of MA are used to calculate financial and non-financial performances in banks and financial institutions (BFIs)?
- Whether BFIs are in fact measuring non-financial factors and indicators, and if so, to what level is this being done?
- Which factors of NFP are being measured, and which methods or apparatus of MA are useful in measuring them?

- What are the difficulties being practiced by management, what are the causes of these difficulties, and how they might be conquered using the existing MA performance measures?

RESEARCH AND METHODOLOGY

This study involved the collection of data from primary and secondary (annual reports, booklets, and special publications on related issues) sources and literature survey. Data was collected by semi-structured interviews with chief executive officers (CEOs) of four BFIs during the year 2013-2014. The questions covered an introduction to the institution, MA practices in the institutions, and performance measures – both financial and non-financial.

The present study was able to make a meaningful comparison of the role of MA in different types of financial institutions. The purpose of the study was not to contrast like with like, but to study the role of MA in non-financial PM in dissimilar types of financial institutions. Even though the study attempts to draw some comprehensive conclusions, the authors are aware that generalizing from only four BFIs must be treated with care. For practical reasons it was not likely to expand the study population. The secondary sources of information were useful for comparing the objectives of CEOs with actual MA practice.

Management accounting in performance measurement in BFIs

Based on the analysis of the data collected, this part discusses performance measurement in banks and financial institutions.

Bank A

Bank A is the largest commercial bank, and has branches throughout. Its crest management emphasizes the measurement of performance as being "very important", and financial performance of every section in the bank is often measured. The methods and models that are taken to measure performance are activity-based cost management (ABCM), benchmarking, and performance pyramid. Bank management reports no difficulties with measuring performance by means of the present methods, apart from deference with risk-adjustment matters. The call for correct risk-analysis and customer and product profitability is very important for the chief executive. Customer and product profitability are also vital factors in which management feels a need to develop its present practice of PM. The views of Bank A on the subject of PM are presented in Table 1.

Although the CEO accorded only some significance to NFP, the bank does measure NFP regularly. In doing so, Bank A uses the same models and methods for measuring NFP as it does for measuring financial performance. The management of bank A is well content with the present methods, and would like to carry on the present practice in future, assuming no considerable change in the bank's internal and external circumstances.

The executives of A recognize the worth and importance of MA systems in PM, but measurement of NFP is moderately less emphasized than that of financial performance. This is reflected in the planning of MA systems and the measurement process itself. Declining production costs, control of profit centers, and financial planning are all significant in the view of top management, and are relatively more important than certain non-financial aspects (such as environmental issues). The CEO pays a lot of concentration to the measurement of a variety of risks and to the profitability of customers and products, and less attention to the measurement of non-financial indicators. Nevertheless, several important aspects of NFP are measured – including customer satisfaction, quality, on-time service, promise to customers, and so on. Of these, on-time delivery of services and commitment to customers may be considered a part of the attempt to make sure customer satisfaction.

The business procedure has already been re-engineered, and ABCM and life cycle are used to measure performance (as well as for other aspects, such as costing). Though, in view of the chaos in the banking sector, management feels a need to utilize life-cycle theory – which seems to be a useful and timely approach as long as economic conditions remain uncertain, total quality management (TQM) is progressively being implemented, and management feels that TQM is also likely to be supportive in measuring both financial and NFP accurately. However, since non-financial PM is not receiving a high priority from management, it is likely that TQM will be used to drive the financial performance.

In this case, the CEOs are not so much worried about whether the cost-accounting system is modern or not. Rather, they are paying more attention in seeing that MA systems help to reduce service costs. They are also keen to make correct decisions in civilizing the allocation mechanism of indirect costs. Whatever the rights and wrongs of this report, there is no significant problem in this bank with accumulating data on costs, and the cost-accounting system do fit with the actuality of the business.

Bank B

Bank B is a financing house under the sunshade of a large commercial bank. Its growth rate in the past five years has been about 10 per cent per annum, with a 15 per cent average rate of return. The management of Bank B does not accord much importance to measuring performance. Indeed, Bank B measures performance only in terms of the activities of the sales and promotion departments. In spite of this apparent unresponsiveness to general performance measurement, it is interesting to note that management does utilize balanced scorecard (BSC).

The CEO expects that target-costing and BSC, taken together, can resolve their problems in this regard. It is obvious that the organisation does not have a clear conception of how this might be achieved, but the firm believes that the two methods can be merged to make a practical tool for accurate measurement of performance. The role of PM in Bank B is presented in Table 2.

The top management of Bank B believes strongly in the importance of non-financial PM in the organization, but they practice it only “sometimes”. The targeted aspects of non-financial PM are customer pleasure, quality, quick response, and one-time service. These are measured using the idea of process-type theory and benchmarking. In this look management is “somewhat” content with the accuracy of present NFP measures, and they are bearing in mind the development of a completely new model of NFP measures. According to an executive, none of the obtainable models of performance measures is suitable for measuring NFP in the organization. This executive believes that the traditional approach of sending a questionnaire to customers does not give a realistic picture of customer anticipation. He notes that since Bank B works under the patronage of a large bank, it receives direct support (and sometimes also pressure) to measure overall activity properly. Bank B has few products and a limited number of customers, and management therefore focuses its efforts on assisting these customers as they are "the future" of this organization. Concerning the ability to reduce service costs to make the organisation more competitive, he is rather doubtful. He is concerned about the need to do "more" to decrease service costs.

Top management says that when they feel the need to measure customer satisfaction they do so by using questionnaires, after which customer satisfaction is benchmarked against some other financial institutions. However, benchmarking does not have an effective role because of the narrowly defined range. Moreover, since Bank B's products are few and distinctive, their service-process type of theory is also not effective – because, as Fitzgerald *et al*. (1991) have noted, process-type theory emphasizes the individuality of a service shop.

Bank B has re-engineered its business process, but this has not helped in establishing non-financial PM in the organisation. Total costing (TC) is used for costing purposes, and is even helpful for financial performance measures, but is apparently not deemed to be useful in measuring NFP. A top manager is of the opinion that the methods used to measure financial performance are hard to put into practice in this organization. It is observed that, in practice, when management considers activity-based costing (ABC) and TC, they rather think of making them helpful for financial performance measures and not the measurement of NFP. They do not even regard that there is any need to measure NFP in the organization.

A CEO advises that BSC be practiced in Bank B. However, internal performance (such as employee performance) is not measured. Bank B measures the financial performance of only two departments – sales and production. Therefore, it can be said that Bank B incompletely practices so-called BSC.

Bank C

Bank C is one of the largest co-operative banks, with an average growth rate in the past five years of about 1 per cent. The top management of Bank C does not attach much significance to measuring performance, although management does measure the performance of every section of the organisation. Their major concern is now to make the organisation profitable in the chaos of the banking sector in Finland. The methods and models that are used to measure performance in the organisation are benchmarking and customer survey. When asked whether there was any problem in measuring performance in the organisation, management referred to "some problem". However, management believes that by using some other model the problem can be solved. In this regard, the CEO told of his efforts to use balanced scorecard. Table 3 summarizes the vision of Bank C.

Management is not content with the methods currently being practiced and is therefore thinking of a modification of benchmarking and customer survey, which they believe would be a better way to measure NFP. It is known that benchmarking should be a comparison with the best-practicing organisation if the benefits of benchmarking are to be achieved (Govindarajan and Shank, 1992). However, it was observed that managements in different cooperative banks compare their performance with each other. In practice, they do not compare different financial and non-financial performance measures among other financial institutions (such as commercial or savings banks), and thus the competence and competitive position is under question.

Management does feel the need for one more model to be developed. Management's opinion of ABC and BSC is not very positive because they believe that ABC is good for cost accounting purpose and not for measuring general business performance. According to management, however, it is not possible to achieve everything at the same time as Kaplan and Norton (1996) prescribed. The CEO believes that benchmarking is less useful for measuring NFP. As a result, customer survey is the only method that management prefers to practise. The CEO acknowledges the present system as being "very problematic" in fitting with the reality. The reasons given for not implementing other systems were the reluctance of personnel to change to new systems and the costs of accumulating data. The key behavior and activity drivers were not a problem to find, it is because of the dimension of a self-governing unit and the line of products that Bank C produced.

Though, management does feel the need to modify and improve the present practice of PM, it does not consider the ABC system to be a useful method to measure NFP because it is "very problematic" to implement and from time to time creates misinterpretation and displeasure among personnel. Since the want for FPM is not great, BSC can correctly be used. However, as mentioned earlier, management thinks that "it is not possible to attain the whole thing at the same time".

Bank D

Bank D is a cooperative bank, and its operating function is quite alike to that of a commercial bank. Its top management gives far above the ground precedence to measuring financial performance, and this is measured in every section of the organization. CEO said that he does not have much idea about the integrated PM model, but that he had been informed through an additional source that bank management is using an integrated PM model to measure financial performance. However, benchmarking practice does exist in the organisation. Some troubles are reported with the present PM and top management feels the need for an alternative model of performance measures. Table 4 indicates the perception of Bank D.

Top management of Bank D measure NFP regularly and it is “very important” to them. Many aspects like customer satisfaction and excellence of services are a higher priority. Obligation to customers and on-time service are also significant factors to top management. Being a co-operative bank, social well-being receives a high priority from management, and the welfare of stakeholders is especially important to top management. The management used to measure NFP by using an integrated PM model (mixture of business strategy and performance measures in diverse levels of the organization) and benchmark NFP with similar organizations. They are somewhat satisfied with the accuracy of this present non-financial PM method. The use of an integrated PM model is meant to integrate the strategic objectives into the operation, and therefore, from a normative point of view, but the model is not adept the same way as Nanni *et al*. (1990) suggested. It should chiefly be pointed out that many of Bank D’s units are independent and in many cases they are entitled to decide the cost and MA systems for their own betterment and competence.

FINDINGS AND CONCLUSION

Management Accounting(MA) systems have had a function in measuring performances in diverse banks, but their function in measuring NFP is not as much of significance. The financial PM is a regular and a vital practice but in many BFIs, non-financial performance measures (PM)is less significant and not proficient on a regular basis. From the normative point of view, there is need for precise measurement of different performances and contemporary management accounting scholars are promoting a number of MA methods and techniques to measure performance. Though, in practice, MA performance measurement is dominated by traditional MA techniques (Bromwich and Bhimani,1989).

We observed that benchmarking is the most extensively used PM technique in banks. Two of the four BFIs measured both financial and NFP by benchmarking against other similar kinds of organizations. The idea of benchmarking with top practice organization is not found, but management is somewhat aware of judging their organization's performance at least with like kind of organizations' performance that is not best but better than others. BFIs are rather concerned about their domestic market. Therefore, they do not see the need for benchmarking their performance against non-Indian banks.

Customer satisfaction is the most significant feature of non-financial PM in the BFIs studied. Many of them find that customer approval has a direct impact on improving financial performance, and they are therefore very much conscious about it. The second most vital aspect is quality service in BFIs. Three banks consider quality aspects to be vital, but in one bank quality service is considered as part of the customer satisfaction agenda. Obligation to clients and stakeholders and on-time service is the third most important aspect of non-financial PM in BFIs. In this case, two other banks believe in on-time service and commitment as part of customer satisfaction efforts. Cooperative banks try to maintain commitment with clients and, therefore, they rather consider commitment as an independent aspect rather than part of customer satisfaction.

According to the objectives and strategy of the business, the nature of NFP differs. This can also modify with different micro and macro environments. Under substantial scrutiny, the NFP and its measurement is to guarantee profit for competitive advantages. Most of the NFP measures that are emphasized and measured by management in BFIs are for profit, and we can call them "profit-driven NFP measures". However, efforts are being made by the management of some BFIs to ensure profit in the longer term. These gains can be characterized as "long-term competitive advantages (LTCA)". However, a few activities and performances of BFIs, which are not linked to improving profitability such as work for society, environmental consciousness, and so on, can be called "independent" NFP. The remainder of the efforts is aimed at making profit in the longer term and the achievement of competitive advantage in future markets.

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ANNEXURES

Table 1: Performance measurement in Bank A

Description	Financial PM	Non-financial PM
Importance	Very important	Somewhat
Application of MA systems	Every section	Regularly
Model/method	ABCM, benchmarking, performance pyramid	ABCM, benchmarking, performance pyramid
Problem/contentment	No problem	Well contented
Opinion/suggestion for improvement	Implement raw-rock model	Present systems and methods are OK

Table 2 Measuring performance in Bank B

Description	Financial PM	Non-financial PM
Importance	Somewhat important	Very important
Application	Sales and production sections	Very seldom
Model/method	BSC	Process-type theory, benchmarking
Problem/contentment with	Somewhat problematic	Somewhat contented
Opinion/suggestion for	Target costing and BSC	Need to develop a completely

improvement	should be incorporated	new model

Table 3 Measuring performance in Bank C

Description	Financial PM	Non-financial PM
Importance	Somewhat important	Very important
Application	Every section	Seldom
Model/method	Benchmarking; customer survey (CS)	Customer survey (CS)
Problem/contentment with	Somewhat problematic	Somewhat contented
Opinion/suggestion for improvement	Use some other model	Method to be modified based on benchmarking and CS

Table 4 Measuring performance in Bank D

Description	Financial PM	Non-financial PM
Planning process with MA systems	Process easy, but plans unsuccessful	No plan at all
Usefulness/importance of existing MA systems (benchmarking, integrated PM model)	Somewhat useful and important	Somewhat useful/very important
Fulfillment of the objectives set of using/implementing MA systems	Somehow fulfilled	Fully fulfilled
Difficulties with using MA systems	No difficulty	No difficulty

Table 5 Summary of MA systems in Indian banks and other financial institutions

	Bank A	Bank B	Bank C	Bank D
Description	(commercial bank)	(investment bank)	(co-operative bank)	(co-operative bank)
Number of employees	12000	102	700	1700
Average growth rate in last five years (%)	Information is not delivered	8	2	4
Importance of measuring performance	Very important	Somewhat important	Somewhat important	Very important
Practices of PM in the organization	Every section	Partly (sales and production)	Every section	Every section
Models/methods to measure performance in the organization	ABCM, benchmarking, performance pyramid	Balanced scorecard	Benchmarking, customer survey	Benchmarking, integrated PM model
Problems with PM	Not at all	Somehow problematic	Somehow problematic	Somehow problematic
Ways to overcome the problems with PM	Implement “raw-rock” model	TC and BSC should be incorporated	Use other model	Alternative models be found
Importance of measuring NFP	Somehow	Very important	Very important	Very important
Practice of	Regularly	Very seldom	Seldom	Regularly

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measuring NFP	measured			
Targeted aspects of NFP in organization	Customer satisfaction, quality, commitment, on-time service, etc.	Customer satisfaction, quality, quick response, on-time service	Customer satisfaction, quality, commitment	Customer satisfaction, quality, commitment, social well-being, on-time service
Models/methods to measure NFP	ABCM, benchmarking, performance pyramid	Process type theory and benchmarking	Customer survey	Benchmarking, integrated PM model
Contentment with the accuracy of measuring NFP	Well contented	Somehow contented	Somehow contented	Well contented
Opinion/suggestion on improving non-financial PM method	Present methods are OK to practice	Need to develop a complete new method/model	Model to be modified, based on customer survey and benchmarking	New model should be developed (preferably with software)

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SUPPORT OF INTERNATIONAL ACCOUNTING STANDARD IN BUSINESS MANAGEMENT

Dr. Mona Tanna*

Vipin Thareja**

The paper traces the benefits of international accounting standards and their contribution to harmonization in business practice. In this review, the goal is to describe and summarize how the accounting standards promote management decisions and influence the business environment in a global scale. It is expected that the unified, standardized accounting information system will lead to new types of analysis and data, with the possible integration of new indicators from the business management practice of certain countries. The author analyzed and valued the effects of international standards on the business economic environments. It was shown that uniform management accounting standards will increase market liquidity, decrease transaction costs for investors, lower cost of capital, and facilitate international capital formation and flow. Reduced costs will also result in more cross-listings and cross-border investments. The global accounting standards would enable the world's stock markets to become more closely integrated. The more closely world's stock markets approach a single market, therefore, the lower should be the transaction costs for investors and the cost of capital for firms in that market. The differences in international reporting practice prior to IFRS constituted a palpable barrier to efficient international investment, monitoring and contracting.

Keywords: Management Information System, International Accounting Standards, Economics of Standards, Business Effects, Value Based Management.

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*Asst. Professor, MKHS Gujrati Girls College, Indore (M.P.)

** Research scholar, Devi Ahilya Vishwavidhyalaya, Indore (M.P.)

INTRODUCTION

In today's business environment, companies need to take every advantage they can to remain competitive. Global competition, rapid innovation, entrepreneurial competitors, and increasingly demanding customers have altered the nature of competition in the marketplace.

This new competitive environment requires companies' ability to create value for their customers and to differentiate themselves from their competitors through the formulation of a clear business strategy. Business strategy must be supported by appropriate organizational factors such as effective manufacturing process, organizational design and accounting information systems too. Modern business environments are increasingly competitive and dynamic. International competition through e-commerce and demand-based supply chain management dominate business. It is important for companies to develop coherent and consistent business strategies and to utilize management accounting tools to support strategic planning, decision-making and control. To integrate business strategies with various management accounting tools, companies first need to identify which business they are in. It is essential to identify products and services, customer types, geographical markets, and delivery channels. It is useful to match the strategic business unit (SBU) with the related business unit strategy. An SBU is a company's department or sub-section which has a distinct external market for goods or services that differ from another SBU. A business unit strategy is about how to compete successfully in particular market. It is important to focus on a certain segment, such as environmentally friendly cars, in the automobile industry or internet and phone banking in the retail banking industry. To be successful in this cut-throat competition, business world is very tough, particularly, if you are not too familiar with the diverse strategies, which are needed to make a business successful. If you cannot make a success story out of your business, there is no use of operating a business. You must have to undertake some strategies to run your business successful. These strategies are accounting, bookkeeping, marketing, promotion, production and manufacturing. Now, what a business owner needs to do is prioritize work - what need to be done on priority basis. And, this will vary greatly from business to business. Accounting help is something that any business requires to embark on, in particular, if you are operating a large scale business. If you are running a small or mid-size business, than you can easily handle the accounting work without obtaining professional assistance.

International Financial Reporting Standards (IFRS) are accounting principles, methods (standards) issued by the International Accounting Standards Board (IASB), an independent organization based in London. They purport to be a set of standards that ideally would apply equally to financial reporting by public companies worldwide. Between 1973 and 2000, international standards were issued by IASB's predecessor organization, the International Accounting Committee (IASC), a body established in 1973 by the professional accountancy bodies in Australia, Canada, France, Germany, Japan, Mexico, Netherlands, United Kingdom and Ireland, and the United States. During that period, the IASC's principles were described as 'International Accounting Standards' (IAS). Since April 2001, this rule-making function has been taken over by a newly-reconstituted IASB. From this time on, the IASB describes its rules under the new label 'IFRS', though it continue to recognize (accept as legitimate) the prior rules (IAS) issued by the old standard-setter (IASC).The IASB is better-funded, better-staffed and more independent than its predecessor, the IASC. Nevertheless, there has been substantial continuity across time in its viewpoint and in its accounting standards. Widespread international adoption of IFRS offers equity investors the next potential advantages (Ball et al., 2006).

IFRS promise more accurate, comprehensive and timely financial statement information, relative to the national standards they replace for public financial reporting in most of the countries adopting them, including continental Europe. Small investors are less likely than investment professionals to be able to anticipate financial statement information from other sources, improving financial reporting quality allows them to compete better with professionals, and hence reduces the risk they are trading with a better-informed professional. IFRS eliminate many of the adjustments analysts have made in order to make companies' financials more comparable internationally. Reducing the cost of processing financial information most likely increases the efficiency which the stock market incorporates it in prices. IFRS offer increased comparability and hence reduced information costs and information risk to investors.

Accounting regulation in the European Union introduced from 2005 obligated economic entities listed and traded on stock markets to apply IFRS on consolidated financial statements exerted a decisive influence on the accounting globalization. The draft – accepted by the US Securities and Exchange Commission (SEC) enables the acceptance of financial statements created on the basis of IFRS without converting it according to US General. Accounting Principles (GAAP) was a significant leap toward the convergence of IFRS and US GAAP. SEC is to examine the possibility for US economic entities to choose between US GAAP and IFRS for avoiding the necessity of revealing differences between the two systems and to conduct its comparison. Moreover on March 2007, SEC announced its intention to accept financial statements created in accordance with IFRS from January 1, 2009 beside the ones created according to US GAAP. Multinational companies like Daimler Chrysler owning more than 900 subsidiaries, operating on 5 continents in more than 60 counties, published financial results according to international standards which was 1.5 times of the one according to German accounting standards. If earning after taxation (EAT) – deducted actual tax burdens - according to US GAAP is taken as 100 percent, due to differences between national accounting standards, EAT would be 25% more in UK, 3% less in France, 23% less in Germany and 34% less in Japan (Barth et al. 2007). The European Commission's (EC) directives were aimed at making financial statements increasingly comparable in terms of format and general recording and measurement rules. The Fourth Directive, enacted in 1978, specifies "True and Fair View"(TFV) as an overriding principle of financial reporting. It defines the format and measurement of balance sheets and profit and loss accounts. The Seventh Directive, issued in 1983, addresses association with consolidations. The most important effects of both directives are the adoption of TFV and relaxation of book-tax conformity for consolidated accounts.

LITERATURE REVIEW

International accounting literature provides evidence that accounting quality has economic consequences, such as costs of capital (Leuz and Verrecchia, 2000), efficiency of capital allocation (Bushman and Piotroski, 2006) and international capital mobility (Guenther and Young, 2008). The accounting system is a complementary component of the country's overall institutional system (Ormrod et al., 2006) and is also determined by businesses' incentives for financial reporting. Li and

Meeks (2006) provide the first investigation of the legal system's effect on a country's financial system.

The financial reporting quality include the tax system (Schleifer and Vishny, 2003) ownership structure (Easton, 2006; Ball and Lakshmann, 2005), the political system (Radebaugh and Gray, 2007), capital structure (Daske et al., 2006) and capital market development (Botsari and Meeks, 2008). Therefore, controlling for these institutional and firm-level factors becomes an important task in the empirical research design too.

A study by Meeks and Swamm (2009) characterises of accounting amounts for businesses that adopted international standards to a matched sample of companies that did not, and found that the former evidenced less earnings management, more timely loss recognition, and more value relevance of accounting amount than did the latter. They found, that international standards adopters had a higher frequency of large negative net income and generally exhibited higher accounting quality in the post-adoption period than they did in the pre-adoption period. The results suggested an improvement in accounting quality associated with using international standards.

Another study by Jermakowicz et al. (2007) found that first time mandatory adopters experience statistically significant increases in market liquidity and value after international standards reporting become mandatory. The effects were found to range in magnitude from 3 % to 6 % for market liquidity and from 2 % to 4 % for businesses by market capitalization to the value of its assets by their replacement value.

The role of International Accounting Standards in Business Planning

The first priority of the Financial Accounting Standards Board (FASB) is to improve financial reporting for the benefit of investors and other users of financial information in U.S. capital markets. We do that by striving to set the highest-quality standards, which collectively are known as Generally Accepted Accounting Principles (GAAP).

The FASB believes that seeking more comparable global accounting standards—improving the quality of accounting standards used around the world while reducing differences among those standards—is consistent with its core mission. Investors,companies, auditors, and other participants in the U.S. financial reporting system benefit from the increased comparability that can result from the closer alignment of standards used internationally. More comparable standards have the potential to reduce costs for both users and preparers of financial statements and make worldwide capital markets more efficient. The Securities and Exchange Commission (SEC) expects the FASB to consider, in developing standards, the extent to which international comparability is necessary or appropriate in the public interest and for the protection of investors.

The bilateral convergence program begun in 2002 by the FASB and the International Accounting Standards Board (IASB), the FASB has implemented a three-part strategy for seeking greater comparability in accounting standards internationally:

- Developing high quality GAAP standards
- Actively participating in the development of International Financial Reporting Standards (IFRS)
- Enhancing relationships and communications with other national standards setters.

Developing High Quality GAAP Standards

The FASB continually strives to meet the needs of investors and other users of GAAP-based financial reports, both within and outside the United States, by improving the quality of GAAP. The FASB believes that the high-quality standards it develops will continue to influence the shape and future direction of international standards, as they have for more than 40 years. As it undertakes standard-setting projects, the FASB carefully evaluates whether U.S. financial reporting would be improved by implementing approaches consistent with particular IFRS standards. This also would enhance international comparability for the benefit of investors and other capital market participants. This evaluation happens on a standard basis.

Actively Participating in the Development of IFRS

The FASB participates actively in the development of IFRS, providing input on IASB projects through the IASB’s Accounting Standards Advisory Forum (ASAF) and through other means. The FASB contributes to the development of IFRS by sharing views based on its past experience or developed through the FASB's due process, stakeholder outreach, analysis, and deliberations. We believe our efforts to improve GAAP benefit from the international perspectives gained through our interactions with the IASB.

Enhancing Relationships and Communications with Other National Standard Setters

The FASB works to maintain and strengthen its existing cooperative relationships with other national standard setters. The broader flow of information and ideas resulting from these relationships mutually informs each organization's thinking and contributes to the shared understanding of perspectives and circumstances that can reduce or avoid unnecessary differences among standards used internationally. In some cases, however, the FASB (or other national standard setters) may conclude that the best interests of its own capital markets outweigh the goal of completely converged accounting standards. Since 2000, significant progress has been made toward achieving greater comparability in accounting standards on an international level. The increasing number of countries around the world has decided to require the use of IFRS, which increased the comparability of reporting internationally.

But increasing the comparability of standards is not easy. It cannot be accomplished by the FASB alone; it requires cooperation and agreement among standard setters around the world. Different starting points, different business cultures, different regulatory environments, different financial reporting objectives, and different legal systems can make it difficult for standard setters around the world to agree on the same accounting alternative. Moreover, an alternative that is perceived as an improvement in one country may not be perceived as an improvement by another country.

The FASB is developing the current expected credit loss (CECL) approach to accounting for impairment of financial instruments in response to feedback that the complex "three-bucket approach" developed with the IASB would be difficult to apply and would likely have decreased loan loss reserves of U.S. financial institutions. That result is counterintuitive to the lessons learned during the recent financial crisis. The FASB has made an initial decision to retain the straight-line approach of expense recognition for certain leases owing to a different conclusion about the benefits and costs of the IASB's proposed front-loaded approach. Dramatically different starting points affected the approach to the insurance contracts project. GAAP long has had standards while IFRS has not. In response to feedback from investors and others that GAAP was largely meeting their needs, the FASB abandoned the fundamental revisions necessary for full convergence to focus on more targeted improvements. Early in their bi-lateral convergence program, the FASB and IASB concluded that international comparability would be enhanced if GAAP and IFRS used the same words and phrases. Recent experiences raise questions about that conclusion. The FASB is considering whether international comparability may sometimes require the use of different words or additional guidance tailored to the U.S. reporting environment. For example, the FASB has been told that the definition of a business in the jointly developed business combination standard is being interpreted differently in the U.S. than elsewhere, notwithstanding the use of identical descriptions.

CONCLUSION

International accounting standards create more transparency on the financial market. This provides investors more accurate information on company profiles. This way, even small investors (and not only professionals) will be able to get the information needed for their investment choices, thus they will be able to better compete on the market. More transparency will result in more international transactions that will have reduced costs because of the clear information provided by companies' reports. In case of consolidated accounts, (when the company has foreign subsidiaries) book-keeping will be facilitated and will also result in reduced transaction costs. No more adjustments will be needed in order to make financial reports of companies internationally comparable. Reduced costs will also result in more cross-listings and cross-border investments. International accounting standards also have a good effect on the division of labour. Thus, these standards and the less transaction costs will enable companies to be able to trade easier between each other. This will let them specialize in the field of their strengths and rather rely on suppliers that are also specialists in another field of their own than trying to produce the same product in-house, which will create a division of labour on the market. Accounting standards also provide information on company's disclosure. Better transparency, by providing more information, and providing the accurate and understandable information will reduce the risk perceived by investors. The risk in question is the accounting risk that comes from the difficulties in understanding the accounting principles and standards applied by the firm, and also the inability of investors to process the information provided.

International accounting standards are also becoming more popular and tend towards integration as the global economy. The global standards have many benefits that are supported by many factors. However, there exist some restraining factors. Due to the globalization of the markets, international investors need access to financial information of companies that is easier by harmonized accounting standards. Many economic choices are done when investors realize their activities. These economic factors mostly favour international harmonization. Clear information is needed in order to facilitate investments in all the sectors. It seems to be apparent that the appropriate international accounting standards contribute to the division of labour, to financial innovation and to the reduction of the transactional costs, the cost of capital and even to the increase of the enterprises' earnings. The first argument for the harmonization of accounting standards is the existence of the multinational companies, who invest enormous efforts into the preparation of their financial statements in order to comply with the national standards. For these companies life would be much easier if the same rules would apply to their subsidiaries all round the world. On the other hand, this would be profitable for the investors as well, as they could compare the enterprises' results without difficulties, which would spare both money and other resources for them. This would also lead to the reduction of the information asymmetry between managers and investors. The information asymmetry is a costly thing which can be blamed for the increase of the equity's cost and the inaccuracy of the economical and the financial forecasts. So the aim of the international accounting standards is that similar transactions are treated the same way all around the globe, which enables the creation of unified financial statements.

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EFFECT OF CREDIT RISK ONTHE PERFORMANCE OF NEPALESE COMMERCIAL BANKS

Yuga Raj Bhattarai*

This study has examined the effect of credit risk on performance of Nepalese commercial banks. The descriptive and causal comparative research designs have been adopted for the study. The pooled data of 10 commercial banks for the period 2010 to 2015 have been analyzed using regression model. The regression results revealed that non-performing loan ratio has negative effect on bank performance whereas 'cost per loan assets' has positive effect on bank performance. Capital adequacy ratio has negative but statistically insignificant relationship with bank performance. This study concludes that there is significant relationship between bank performance and credit risk indicators. This study recommends that commercial banks in Nepal should enhance their capacity in credit analysis and loan administration while the regulatory authority should pay more attention to the banks' supervision, focusing on the compliance of relevant provisions and directives towards the banking activities.

Keywords: Bank, Credit, Nepalese, Performance, Regression, Risk.
JEL Classification: C88, G32, H81, M38, N25, O16.

Associate Professor , Faculty of Management Patan Multiple Campus, Lalitpur Tribhuvan University, Nepal.

INTRODUCTION

Credit risk is by far the most significant risk faced by banks and the success of their business depends on accurate measurement and efficient management of this risk to a greater extent than any other risk (Gieseche, 2004). It is a risk of financial loss if a borrower or counterparty fails to honor commitments under an agreement and any such failure has an adverse effect on the financial performance of the bank.

Coyle (2000) defines credit risk as losses from the refusal or inability of credit customers to pay what is owed in full and on time. It arises mainly from direct lending and certain off-balance sheet products such as guarantees, letters of credits, foreign exchange, forward contracts and derivatives and also from the bank's holding of assets in the form of debt securities. It may take the form of delivery or settlement risk. It is critical to bank survival or failure because banks traditionally earn their huge profits from interest on their risk exposures. The management of credit risk is a critical component of a comprehensive approach to risk management and is essential to the long-term success of a commercial bank.

The importance of credit risk management to commercial banks cannot be over emphasized and it forms an integral part of the loan process. Loan and advances provided to borrowers may be at the risk of default, whereas banks extend the credit on the understanding that borrowers will repay their loans. Some borrowers usually default, and as a result, the bank's income decreases due to the need to increase loan loss provisions for such loans. Where commercial banks do not have an indication of what proportion of their borrowers will default, earnings will vary thus exposing the banks to an additional risk of variability of their profits (Onyiriuba, 2009). Effective management of credit risk can enhance banks' goodwill and depositors' confidence. Thus, good credit risk policy is an essential condition for banks' performance and capital adequacy protection.

This study provides empirical evidence in confirming the validity of the theories to assist the bank's management in determining the best credit risk strategies that enhance bank performance. Moreover, the fact that the banking industry in Nepal is still growing and it should ensure that effective strategies are put in place to minimize risk and maximize loan performance at any particular point while in operation. Thus, this study aims to analyze the effect of credit risk on bank performance of commercial banks listed in the Nepalese Stock Exchange. The findings of this study may enable bank executives understand how credit risk affect the bank performance and they may then adopt the appropriate credit risk strategies.

THEORETICAL REVIEW

Granting credit is one of the main sources of income (interest income) in commercial banks and also a source of credit risk. Therefore, the management of the risk related to that credit affects the profitability of the banks (Li and Zou, 2014). A bank exists not only to accept deposits but also to grant credit facilities, therefore inevitably exposed to credit risk. According to Chen and Pan (2012), credit risk is the degree of value fluctuations in debt instruments and derivatives due to changes in the underlying credit quality of borrowers and counterparties. Credit risk management maximizes bank's risk adjusted rate of return by maintaining credit risk exposure within acceptable limit in order to provide framework for understanding the impact of credit risk management on banks' profitability (Kargi, 2011). Demirguc-Kunt and Huzinga (1999) opined that credit risk management is in two-fold which includes, the realization that after losses have occurred, the losses becomes unbearable and the developments in the field of financing commercial paper, securitization, and other non-bank competition which pushed banks to find viable loan borrowers. The main source of credit risk include, limited institutional capacity, inappropriate credit policies, volatile interest rates, poor management, inappropriate laws, low capital and liquidity levels, direct lending, massive licensing of banks, poor loan underwriting, laxity in credit assessment, poor lending practices, government interference and inadequate supervision by the central bank (Kithinji, 2010).An increase in bank credit risk gradually leads to liquidity and solvency problems.

A sound credit risk management framework is crucial for banks so as to enhance profitability and guarantee survival. According to Lindergren (1987), the key principles in credit risk management process are sequenced as follows: establishment of a clear structure, allocation of responsibility, processes have to be prioritized and disciplined, responsibilities should be clearly communicated and accountability assigned. Brownbridge (1998) concluded that effective quantitative models make it possible to numerically establish the factors that are important in explaining default risk, evaluating the relative degree of importance of the factors, improving the pricing of default risk, screening out bad loan applicants and calculating any reserve needed to meet expected future loan losses. Margrabe (2007) postulates that even though credit risk remains the largest risk facing most commercial banks, the practice of applying modern portfolio theory to credit risk has lagged.

LITERATURE REVIEW

Credit risk plays an important role on banks' profitability since a large chunk of banks' revenue accrues from loans from which interest is derived. However, credit risk may be a serious threat to the performance of banks. Therefore various researchers have examined the impact of credit risk on banks in varying dimensions. The major studies related to the issue of credit risk and bank performance have reviewed as follows:

Ahmed, Takeda and Shawn (1998) have found that loan loss provision has a significant positive influence on non-performing loans. Therefore, an increase in loan loss provision indicates an increase in credit risk and deterioration in the quality of loans consequently affecting bank performance adversely. Mekasha (2001) has investigated credit risk management and its impact performance on Ethiopian Commercial Banks. The researcher used 10 years panel data from the selected commercial banks for the study to examine the relationship between ROA and loan provision, non-performing loans and total assets. The study revealed that there is a significant relationship between bank performance and credit risk management.

Ahmad and Ariff (2007) have examined the key determinants of credit risk of commercial banks on emerging economy banking systems compared with the developed economies. The authors found that regulation is important for banking systems that offer multi-products and services; management quality is critical in the cases of loan-dominant banks in emerging economies. An increase in loan loss provision is also considered to be a significant determinant of potential credit risk. The authors further asserted that credit risk in emerging economy banks is higher than that in developed economies.

Ben-Naceur and Omran (2008) in an attempt to examine the influence of bank regulations, concentration, financial and institutional development on commercial banks' margin and profitability in Middle East and North Africa (MENA) countries from 1989-2005 have found that bank capitalization and credit risk have positive and significant impact on banks' net interest margin, cost efficiency and profitability. Felix and Claudine (2008) have investigated the relationship between bank performance and credit risk management. It could be inferred from their findings that return on equity (ROE) and return on assets (ROA) both measuring profitability were inversely related to the ratio of non-performing loan to total loan of financial institutions thereby leading to a decline in profitability.

Kithinji (2010) has assessed the effect of credit risk management on the profitability of commercial banks in Kenya. Data on the amount of credit, level of non-performing loans and profits were collected for the period 2004 to 2008. The findings revealed that the bulk of the profits of commercial banks are not influenced by the amount of credit and non-performing loans, therefore suggesting that other variables other than credit and non-performing loans impact on profits.

Al-Khouri (2011) has examined the impact of bank's specific risk characteristics, and the overall banking environment on the performance of 43 commercial banks operating in 6 of the Gulf Cooperation Council (GCC) countries over the period 1998-2008. Using fixed effect regression analysis, results showed that credit risk, liquidity risk and capital risk are the major factors that affect bank performance when profitability is measured by return on assets while the only risk that affects profitability when measured by return on equity is liquidity risk.

Kargi (2011) has evaluated the impact of credit risk on the profitability of Nigerian banks. Financial ratios as measures of bank performance and credit risk were collected from the annual reports and accounts of sampled banks from 2004-2008 and analyzed using descriptive, correlation and regression techniques. The findings revealed that credit risk management has a significant impact on the profitability of Nigerian banks. It concluded that banks' profitability is inversely influenced by the levels of loans and advances, non-performing loans and deposits thereby exposing them to great risk of illiquidity and distress.

Epure and Lafuente (2012) have assessed bank performance in the presence of risk for Costa-Rican banking industry during 1998-2007. The results showed that performance improvements follow regulatory changes and that risk explains differences in banks and non-performing loans negatively affect efficiency and return on assets while the capital adequacy ratio has a positive impact on the net interest margin. Paudel (2012) also examined the impact of credit risk management on the financial performance of commercial banks in Nepal using the financial report of 31 banks for eleven years (2001-2011). The methods of data analysis in the study were descriptive, correlation and multiple regressions. The financial performance indicator used in the study was return on assets (ROA). The predictors of the banks' financial performance used in the study were: default rate, cost per loan assets and capital adequacy ratio. The author asserts that all these parameters have an inverse impact on banks' financial performance.

Abiola and Olausi (2014) have investigated the impact of credit risk management on the performance of commercial banks in Nigeria. Financial reports of seven commercial banking firms were used to analyze for seven years (2005–2011). Panel regression model was employed for the estimation of the model. In the model, return on equity (ROE) and return on assets (ROA) were used as the performance indicators while non-performing loans (NPL) and capital adequacy ratio (CAR) as credit risk management indicators. The study revealed that credit risk management has a significant impact on the profitability of commercial banks' in Nigeria.

Alshatti (2015) has examined the effect of credit risk management on financial performance of the Jordanian commercial banks during the period 2005-2013 using capital adequacy ratio, credit interest/credit facilities ratio, provision for facilities loss/ net facilities ratio, leverage ratio and non-performing loans/gross loans ratio as independent variables. The dependent variables represent the profitability measured by ROA and ROE. The author concludes that all the credit risk management indicators used in the study have significant effect on the financial performance of the Jordanian commercial banks.

Kodithuwakku (2015) has analyzed the impact of credit risk management on the performance of the commercial banks in Sri Lanka by using both primary and secondary data. The return on assets (ROA) is used as performance indicator and loan provision to total loan (LP/TL), loan provision to non-performing loans (LP/NPL), loan provision to total assets (LP/TA) and non-performing loans/

total loans (NPL/TL) were used as indicators of credit risk. The result shows that non-performing loans and provisions have an adverse impact on the profitability.

Ugoani (2015) has examined the relationship of poor credit risk management and bank failures in Nigeria using survey research design. The results from the Chi-square statistics revealed that weak corporate governance accelerates bank failures and the credit risk management function is to the greatest extent the most diverse and complex activity in banking business. The author concludes that poor credit risk management influences bank failures.

CONCEPTUAL FRAMEWORK

Commercial banks are exposed to high risk loans. The higher is the accumulation of unpaid loans implying that these loan losses have produced lower returns to many commercial banks. Basel Committee on Banking Supervision (1999) asserts that loans are the largest and most obvious source of credit risk, while other are found on the various activities that the bank involved itself with. The indicators to measure the credit risk management: capital adequacy ratio (CAR) and non-performing loans ratio (NPLR), which are the main indicators used to assess the soundness of the banking system (Bhawani and Bhanumurthy, 2012). Kurawa and Garba (2014) have pointed out the credit risk management (CRM) indicators such as: default rate (DR), cost per loan assets (CLA), and capital adequacy ratio (CAR) which influence banks' profitability (ROA). However, every bank needs to identify measure, monitor and control credit risk and also determining how credit risks could be lowered. This means that a bank should hold adequate capital, control the non-performing loan and maintain the appropriate cost per loan assets. The most of the related empirical studies reported that firm performance is affected by capital adequacy ratio, non-performing loan and cost per loan assets. Thus, in order to test the effect of these variables on the performance of Nepalese commercial banks, this study develops the following conceptual framework.

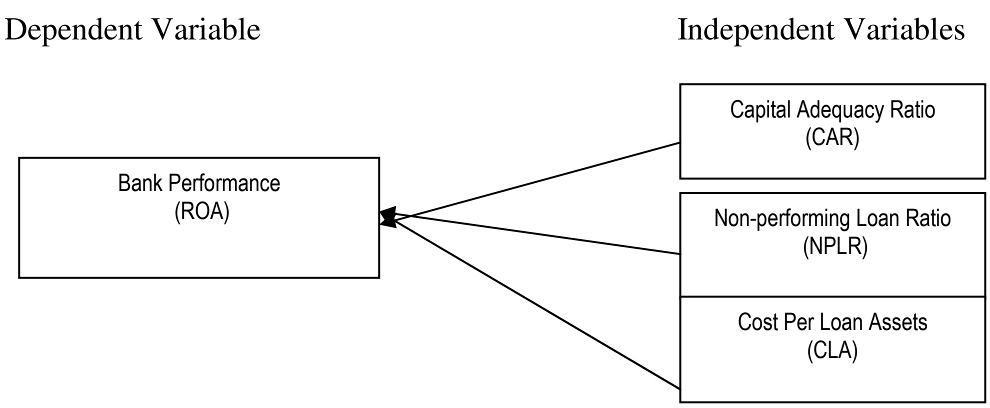

Figure 1: Conceptual framework

RESEARCH METHODOLOGY

The sample

This study examines the effect of credit risk on the performance of commercial banks in Nepal over the period of 6 years (2010-2015).The reason behind choosing of the latest five year period is to include the afresh data in the analysis and as the data are from pooling of cross-sectional and time series, thus it seems sufficient to generate data for the analysis. This study has adopted descriptive and causal comparative research design.

The selection of sample size is important for any study and should depend on the purpose of the analysis. Hair, Anderson, Tatham and Black (2006) argue that there should be five observations for each independent variable (multivariate analysis). Further, they assert that although the minimum ratio is 5 to 1, the desire level is between 15 to 20 observations for each independent variable. When this level is reached, the results should be generalized if the sample is representative. In view of Hair, Anderson, Tatham and Black (2006), the 53 observations chosen for this study seem adequate sample size because there are three independent variables used in the estimated regression model. Thus, the selected sample size for the study justifies the minimum sample size required to run the regression model.

The convenience sampling method was used in choosing the banks for the study. Moreover, in selecting the 10 banks for the study, due care is given to include banks such as: joint venture, domestic, best performer, average performer and comparatively week performer in the sample.The banks selected for the study are:Bank of Kathmandu Ltd., Everest Bank Ltd., Machhapuchchhre Bank Ltd., Nabil Bank Ltd., Nepal Bangladesh Bank Ltd., Nepal Investment Bank Ltd., Nepal SBI Bank Ltd., Sanima Bank Ltd., Siddarth Bank Ltd., and Sunrise Bank Ltd. Data were sourced from the annual reports of the banks in the sample. The data include time-series and cross-sectional data, i.e. pooled data set and estimated the effect of credit risk on the performance of commercial banks using pooled data regression. Data analysis was done using the Statistical Package for Social Sciences (SPSS)-16.

DEVELOPMENT OF HYPOTHESIS

Bank performance is the dependent variables used in this study. The explanatory variables included in this study are: capital adequacy, non-performing loan and cost per loan assets.

Bank Performance

The measures of bank performance may be varied and the choice of the specific performance measure depends on the objective of the study. In theoretical literature the performance measures could be found such as: traditional measures of performance (ROA - return on assets, ROE - return on equity, cost to income ratio, net interest margin), economic measure of performance (EVA-economic value added, RAROC- risk adjusted return on capital) and market based measure of performance (total share return, price-earnings ratio, price-to-book value, credit default swap). Thus, choice of the best measure of performance is tedious task. Moreover, studying the bank performance concept may generate different results depending on the nature of the stakeholders which analyze the term. If they are depositors, the capacity of banks to manage their savings is the measure of performance; if they are equity holders, then the performance is reflected in obtaining the satisfied levels of divisible profit and if they are banks' managers, then the performance is considered from profit point of view and also taking into considerations employees' requests. Such multitude of opinions opens new directions in banking performance research, but this study points out only to classical performance indicator ROA that express the banks capacity to obtain profitability.

ROA measures the profit earned per dollar of assets and reflect how well bank management uses the bank's real investments resources to generate profits (Naceur, 2003 and Alkassim, 2005). For banks with similar business risk profiles, ROA is a useful statistic for comparing the profitability of banks because it avoids distortions that are introduced by differences in financial leverage. Return on assets (ROA) is a comprehensive measure of overall bank performance from an accounting perspective (Sinkey and Joseph, 1992).It seems more suitable for comparing the banks in the same industry than other measures of performance. Thus, return on assets (ROA) is chosen as single performance measure for this study. It shows the effectiveness of management in the utilization of the assets of a commercial bank. It is hypothesized that bank performance is influenced by the credit risk indicators like: capital adequacy ratio, non-performing loan and cost per loan assets.

Capital Adequacy Ratio

This is an independent variable for the determination of the performance and is considered as the core measure of a bank's financial strength from a regulator's point of view. Capital requirement (also known or capital adequacy) is the amount of capital a bank or other financial institution has to hold as required by its financial regulator. This helps to ensure that institutions are not involving in or holding investments that amplify the risk of default. In addition, to guarantee that financial institutions have enough capital to sustain operating losses while honoring withdrawals.

Basel Committee on banking supervision (1988) has introduced a capital measurement system which is generally referred to as the Basel Accord. This framework has been replaced by new and significantly more complex capital adequacy framework known as Basel II. Whilst Basel II considerably changes the calculation of the risk weights, it sets aside the calculation of capital alone. Basel II is based on a three pillars concept, which helps in boosting stability in the financial system: First pillar-minimum capital requirements (addressing risk), Second pillar- supervisory review and Third pillar- market discipline.It is a measure of the amount of bank's capital expressed as a percentage of its risk weighted exposure. It consists of the types of financial capital considered the most reliable, primarily shareholders' equity. Theoretically, banks with good capital adequacy ratio have a good profitability. A bank with a strong capital adequacy is also able to absorb possible loan losses and thus avoids bank 'run', insolvency and failure.

Bank capital increases the capacity to raise non-insured debt and thus banks' ability to limit the effect of a drop in deposits on lending (Ashcraft, 2001).Since higher capital reduces bank risk and creates a buffer against losses, it makes funding with non-insured debt less information sensitive (Admati *et al.*, 2010). Thus, capital adequacy can enhance bank performance. However, empirical studies on the relationship between firms' performance and capital adequacy ratio have shown mixed results.

Jha and Hui (2012) have found negative association between capital adequacy ratio and ROA and the coefficient was statistically significant ($p< 0.05$). Gizaw, Kebede and Selvaraj (2015) find that CAR has a significant negative effect on ROE, but not on ROA. Ezike and Oke (2013) mentioned that holding capital beyond the optimal level would inversely affect the efficiency and profitability of commercial banks. Aruwa and Musa (2012), Kurawa and Garba (2014) found significant positive relationship between capital adequacy variable and financial performance of banks. However, Alshatti (2015) found no effect of the capital adequacy ratio on the financial performance of banks. On this basis a positive relationship between capital adequacy ratio and firm's performance is expected and the coefficients to be positive ($\beta_1>0$).

H_1: Capital adequacy ratio has a significant and positive effect on bank performance.

Non-Performing Loan Ratio

Non-performing loans ratio (NPLR) reflects the bank's credit quality and is considered as an indicator of credit risk management. NPLR, in particular, indicates how banks manage their credit risk because it defines the proportion of loan losses amount in relation to total loan amount (Hosna *et al,* 2009). NPLR has been used as the default rate on total loan and advances. Gizaw, Kebede and Selvaraj (2015) assert that non-performing loan ratio (NPLR) is the major indicator of commercial banks' credit risk. They finds that NPLR which measures the extent of credit default risk sustained by the banks showed a statistically significant large negative effect on profitability measured by ROA. Since it measures the default rate, a negative relationship could be expected between non-performing loan ratio and financial performance of commercial banks. However, empirical studies produce mixed results. Li and Zou (2014) and Alshatti (2015) found the positive effect of non-performing/ gross loans ratio on the financial performance of banks. Contrary to these findings, Felix and Claudine (2008), Kargi (2011) and Kodithuwakku (2015) found an adverse impact of non-performing loans on the profitability. However, Kithinji (2010) asserted that the bulk of the profits of commercial banks are not influenced by the amount of non-performing loans. Jha and Hui (2012) found negative association between NPL ratio and ROA but the coefficient is statistically insignificant. Although there are conflicting evidences on this issue, in view of the theory and

majority of the empirical literature, a negative relationship is expected between non-performing loan and bank's performance ($\beta_2<0$).
H_2:Non-performing loan ratio has a significant and negative effect on bank performance.

Cost Per Loan Assets
Cost per loan asset (CLA) is the average cost per loan advanced to customer in monetary term. Cost per loan asset is calculated dividing total operating costs by total amount of loans. The function of this is to point out efficiency in distributing loans to customers (Appa, 1996; Ahmed *et al*., 1998; Kolapo *et al*., 2012). Thus, cost per loan assets is considered as a determinant of the bank`s performance and is viewed as an indicator of credit risk. Banks that are efficient in managing their expenses (costs), holding other factors constant, earn high profits. Therefore, it is expected that cost per loan assets and bank performance to be negatively associated. This may not always be true because in cases where there are high expenditures due to a lot of businesses done, the bank can still increase the returns. However, the empirical studies show the mixed results on this issue. In Nepalese context, Paudel (2012) has found negative but statistically insignificant association between cost per loan assets (CLA) and bank performance (ROA) but in the Nigerian perspective, Kurawa and Garba (2014) have found significant positive association between cost per loan assets (CLA) ratio and bank's profitability (ROA). In view of theoretical perspective and empirical evidences, a negative relationship is expected between cost per loan assets and bank's performance ($\beta_3<0$).

H_3: Cost per loan assets has a significant and negative effect on firm performance.

The model
Pooled data regression model has been used in the analysis. The technique of pooled data estimation takes care of the problem of heterogeneity in the 10 banks selected for the study. The econometric model employed in the study is given as:
$Y = \beta_0 + \beta X_{it} + \varepsilon_{it}$

Where Y is the dependent variable; β_0 is constant; β is the coefficient of explanatory variables; X_{it} is the vector of explanatory variables; and ε_{it} is the error term (assumed to have zero mean and independent across the time period). By adopting the prescribed econometric model, particularly to this study, the impact of credit risk on the performance of the commercial banks has been estimated with the following regression equation:
$ROA_{it} = \beta_0 + \beta_1 CAR_{it} + \beta_2 NPLR_{it} + \beta_3 CLA_{it} + e_{it}$

Where:
ROA_{it} = Return on assets (ratio of earnings after taxes to total assets) of bank *i* in year *t*

CAR_{it} = Capital adequacy ratio of i^{th} bank in year t
$NPLR_{it}$ = Non-performing loan ratio of i^{th} bank in year t
CLA_{it} = Cost per loan assetsof i^{th} bank in year t
B_0 = Intercept (constant)
β_1, β_2, β_3 = The slope which represents the degree with which bank performance changes as the independent variable changes by one unit variable.
e_{it} = Error component
The selected study variables, their definition, basis of measurement and priori expected sign have been depicted in Table 1.

Table 1:Variables definition, measurement and expected sign

No.	Abbreviation Variables	Description	Measurement	Expected Sign
1	CAR	Capital adequacy ratio	Tier 1 capital + Tier 2 capital/ Risk weighted Assets	+
2	NPLR	Non-performing loan ratio	Non-performing loan/Gross loans and advances	_
3	CLA	Cost per loan assets	Operating cost/ Total loans assets	_

RESULTS AND DISCUSSION

Descriptive statistics

The summary of the descriptive statistics for all variables used in the study is presented in Table 2.The table reports single bank performance indicator (ROA) and three credit risk indicators which are the capital adequacy ratio, non-performing loan ratio, and cost per loan assets. The result shows that the average value of the bank performance (ROA*)* is 1.625% indicating that during the period 2010-2015, on average, the total assets of sample commercial banks in Nepal generate 1.625% return. The standard deviation of the ROA is 0.886, which shows the lack of substantial variation. The minimum capital adequacy ratio is 10.04% that is slightly higher than regulatory requirement of 10% which is the evidence of the compliance of sample banks regarding Nepal Rastra Bank's Directives 2015 and Basel II requirements.

Table 2 Descriptive statistics of variables (n=53)

Variable	Scale	Mean	Std. Deviation	Minimum	Maximum	Percentiles		
						25	50	75
Return on Assets	Percent	1.625	0.886	0.000	4.010	1.045	1.510	2.250
Capital Adequacy Ratio	Percent	12.101	2.860	10.040	28.410	11.015	11.370	11.830
Non-performing Loan Ratio	Percent	1.957	2.552	0.004	17.990	0.645	1.500	2.360
Cost Per Loan Assets	Ratio	0.074	0.039	0.020	0.152	0.035	0.075	0.107

Source: Annual report of sample banks and results are drawn from SPSS-16.

The nonperforming loan ratio among the commercial banks in Nepali is varied from 0.004% to 17.990% with the mean and standard deviation 1.957% and 2.552% respectively which indicates a high volatility among the banks' ability in credit risk management. There is also low variation among the banks in cost per loan assets which is evident from low standard deviation of the cost per loan assets which is 0.039.

Correlation analysis

In an effort to analyze the nature of the correlation between the dependent and the independent variables and also to ascertain whether or not multicollinearity exists as a result of the correlation among variables, Pearson correlation analysis have been computed. The correlation matrix that is shown in Table 3 provides some insights into the independent variables that are significantly correlated to the dependent variable *ROA*. The results indicate that bank performance (ROA) is significantly negatively correlated with non-performing loan ratio. The result implies that as the value of non-performing loan ratio increases, the performance of banks will decrease. As expected, the bank performance (ROA) is significantly positively correlated with cost per loan assets which implies that as the value of cost per loan assets increases, the performance of banks will also increase. However there is negative but insignificant correlation between return on assets and capital adequacy ratio which indicates that the relationship is not strong.

Table 3: Pearson correlation analysis of variables (n=53)

Variable	Return on Assets	Capital Adequacy Ratio	Non-performing Loan Ratio	Cost Per Loan Assets
Return on Assets	1			
Capital Adequacy Ratio	-.135	1		
Non-performing Loan Ratio	-.277*	-.194	1	
Cost Per Loan Assets	.448**	-.317*	.147	1

*. Correlation is significant at the 0.05 level (2-tailed).

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

Source: Annual report of sample companies and results are drawn from SPSS-16.

The correlation matrix of the variables presented Table 3 reveals that all correlations coefficients among the independent variables are less than 0.4, implying the absence of multicollinearity. Thus, there is no evidence of presence of multicollinearity among the independent variables.

Regression results

The Table 4 presents the regression results of effect of credit risk on bank performance. The value of R^2 and adjusted R^2 are 0.324; 0.282 respectively. The overall explanatory power of the regression model is fair with R^2 of 0.324. This indicates that 32.4% of the variation in bank performance can be explained by the variation in the explanatory variables. The p-value for F statistics in the model represent that the model is fairly fitted well statistically. As a test of the presence of multicollinearity among independent variables in the model, the tolerance value (TV) and variance inflation factor (VIF) have been computed. The variance inflation factor (VIF) shows a value less than 1.15 for each variable. The larger the value of VIF, the more troublesome or collinear the variables and as a rule of thumb a VIF greater than 10 is unacceptable (Gujarati, 2004). Thus, VIF less than 1.15 for each variable indicates the non-presence of multicollinearity. The independent variables chosen for the model are best suited for regression analysis.

The result indicates that, capital adequacy ratio is negative and statistically insignificant. Surprisingly, this finding is unusual because, theoretically CAR was expected to have a positive relationship with a bank's performance.

Table 4: Regression results of effect of credit risk on bank performance

Predictors	Coefficients	Std. Error	t-value	P-value	Collinearity Statistics	
					Tolerance	VIF
Constant	1.236	.592	2.088	.042		
Capital Adequacy Ratio	-.016	.039	-.406	.687	.877	1.140
Non-performing Loan Ratio	-.125	.042	-2.983	.004	.954	1.048
Cost Per Loan Assets	11.145	2.858	3.899	.000	.892	1.121
R^2 = 0.324	Adj.R^2 =.282	F = 7.821		F(sig) = .000		

Source: Annual report of sample companies and results are drawn from SPSS-16.

$ROA_{it} = \beta_0 + \beta_1\ CAR_{it} + \beta_2\ NPLR_{it} + \beta_3\ CLA_{it} + \varepsilon_{it}$

As expected, there is a strong negative association between non-performing loans (a measure of the default rate) and banks performance. The result is contrary to the findings of Li and Zou (2014) and Alshatti (2015) who found the positive effect of non-performing / gross loans ratio on the financial performance of banks. However, this result is similar to the findings of Chou and Tenguh (2008); Felix and Claudine (2008); Kargi (2011); Epure and Lafuente (2012); and Kodithuwakku (2015) where they found negative association between non-performing loans and banks performance.

However, cost per loan assets has positive and statistically significant impact on bank performance at 1% level of significance. The result is contrary to priori expectation but is consistent with Kurawa and Garba (2014)who found significant and positive relationship between cost per loan assets and bank performance. The result documented different evidence in Nepalese perspective which was not expected but this evidence indicates that cost per loan assets is the influencing credit risk variable that determines bank performance.

The Table 5 summarizes and compares the relationship between expected sign and actual sign with significant level of variables. The results of the regression model reveal that the coefficients of non-performing loan ratio is similar to that of expected signs. However, the coefficient of cost per loan assets is positive which is contrary to priori expectation. The possible cause of such result is that there may be high expenditures due to a lot of businesses done but higher level of prevailing lending interest rates may produce positive effect to the bank performance (ROA) in Nepalese context. The coefficient of capital adequacy ratio is insignificant meaning that it cannot explain the variation of dependent variable (ROA).

Table 5 Relationship between expected sign and actual sign with significant level

Independent variables	Expected sign	Actual sign	Level of significance
Capital adequacy ratio	+	_	NS
Non-performing loan ratio	_	_	**
Cost per loan assets	_	+	**

***. Significant at the 0.01 level (2-tailed).*
**. Significant at the 0.05 level (2-tailed).*
NS indicates not significant

CONCLUSION

The main purpose of this study is to investigate the impact of credit risk on performance of Nepalese commercial banks. An unbalance panel data of ten commercial banks with 53 observations for the period of 2010 to 2015 have been used for the analysis. The regression model revealed that NPL has negative and statistically significant impact on bank performance. Cost per loan assets has positive and statistically significant impact on bank performance. However, capital adequacy ratio has a negative but statistically insignificant relationship with bank performance.

The findings of this study indicate that the sampled commercial have poor credit risk management practices. This is evidenced by the insignificant result of 'capital adequacy ratio' and the negative coefficient of 'non-performing loan ratio'. The insignificant result of 'capital adequacy ratio' indicates that capital adequacy ratio could not be regarded as the influencing variable for bank performance. The study reject the hypothesis that Nepalese commercial banks with higher capital adequacy ratio can advance more loans and absorb credit losses whenever they crop up and record better performance because coefficient is negative and insignificant. This finding does not support the regulators' re-capitalization policy for commercial banks. Moreover, the negative coefficient of 'non-performing loan ratio' confirms the negative effect on bank performance. NPLR, in particular, indicates how banks manage their credit risk because it defines the proportion of loan losses amount in relation to total loan amount. All these evidences support that Nepalese commercial banks have poor credit risk management.

This study has found the significant relationship between bank performance and credit risk indicators. The study concludes that 'non-performing loan ratio' has negative effect on bank performance whereas 'cost per loan assets' has positive effect on bank performance. The positive coefficient of cost per loan assets indicates the bank's efficiency in distributing loans to customers and collecting higher level of interest revenue as compare to interest expense and other operating costs. Cost per loan assets is considered to be the influencing variable to enhance banks' performance .As a whole, Nepalese commercial banks have poor credit risk management. Thus, these banks need to follow prudent credit risk management and safeguarding the assets of the banks and protect the interests of the stakeholders.

POLICY IMPLICATIONS AND RESEARCH AVENUES

Based on the findings from the empirical analysis, the study offers the following recommendations through which they can work to improve credit risk management and to have an effective role in achieving better performance (ROA). The negative coefficient of 'non-performing loan ratio' with bank performance indicates that there is higher level of loan loss provision charged against profit and eventually leads to reduce performance (ROA). Thus, Nepalese commercial banks should strictly follow the prevailing NRB Directive as well as Basel II Accord while managing credit risk. Compliance with the Basel II Accord means a sound approach to tackling credit risk and this ultimately improves bank performance.

Cost per loan assets (CLA) coefficient exerts most significant positive effect on the performance across the banking firms. Based on the findings of this study, it is recommended that banks in Nepal should enhance their capacity in credit analysis and loan administration while the regulatory authority should pay more attention to banks' compliance to relevant directives and prevailing rules and regulations. Banks need to place and devise strategies that will not only limit the banks exposition to credit risk but will develop performance and competitiveness of the banks, and banks should establish a proper credit risk management strategies by conducting sound credit evaluation before granting loans to customers. It is recommended that bank's credit-granting activities conform to the established strategy that written procedures should be developed and implemented, and that loan approval and review responsibilities are clearly and properly assigned. Senior management must also ensure that there is a periodic independent internal assessment of the bank credit-granting and management functions. The result in this study therefore, suggested the need for strong credit risk and loan service process management must be adopted to keep the level of NPL as low as possible which will enable to maintain the high performance (profitability) of commercial banks in Nepal.

Further, this study is also hoped to be useful to academicians as a source of knowledge for further research. The study is concentrated on only three factors and thus, further study should be carried out on the topic to point out the other factors that enhance mitigation of credit risk to improve performance of Nepalese commercial banks.

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A STUDY OF THE PREVALENT EMPLOYEE ENGAGEMENT MODELS IN THE INDUSTRY

Nidhi Arora*

Dr.Vijay Dhole**

Engagement is about creating opportunities for employees to connect with their colleagues, managers and wider organization. It is also about creating an environment where employees are motivated to want to connect with their work and really care about doing a good job. It is a concept that places flexibility, change and continuous improvement at the heart of what it means to be an employee and an employer in a twenty-first century workplace. The demographics of the workplace has vastly changed in the 21st century; with strong aspects of multi-generational workforce, dominating work values and characteristics through their specific attitudes, perceptions and learning processes. The expectations and expressions of the diverse workforce differ significantly resulting at times in organizational conflicts; challenging both management styles and practices related to managing generational differences across organizations. The short supply and huge demand for talent globally necessitate corporate leadership to better connect with and engage all members of the workforce. Organisations are making efforts to choose the right model suitable for their industry. The present work is an effort to study the employee engagement model prevalent in the industry and develop the structure of approach to employee engagement practices and drivers, to achieve HR advantage in dynamic environment of globalization on fact finding process. The research, guidelines, examples provided in this report—as well as the annotated bibliography—can help to weigh the options and to craft an investment plan that will best suit organization's unique circumstances.

Keywords: Employee Engagement, Human resource, Environment.

* Faculty, Sinhgad Institute of Business Administration and Research, Pune

** Dean, Sinhgad Institute of Business Administration and Research, Pune

INTRODUCTION

Employees are entities, each unique as snowflakes or grains of sand. But, then again employees are persons, possessing common desires in unique proportion. People want to get things done, with others they like, and they want to gain respect, influence and control of their lives. They also want to be able to turn off the cell phone from time to time. Engagement drivers have been the subject of exhaustive research. Opinions differ and diverge, but the drivers distil into four distinct elements:

- Achievement - Getting things done
- Affiliation - Associate with others
- Affluence - Power, respect, control, influence
- Autonomy - Work-life balance, freedom

There are many employee engagement models in the market and each provider claims that their model is based on empirical research. For this, however for each organization that undertakes this, they appear to arrive at different conclusions. It is a known fact, that no two organizations are the same and that the prevailing culture makes a great deal of difference in the results. This study is an effort to collect various models prevalent and prepare a literature review for the convenience of the HR practitioners to analyse the drivers and derive a suitable model for their own organisation. The motive is that this study should be a preliminary document and information resource for a potential future researcher, who may be interested in understanding Indian generation Y employees and employee engagement model which is most suitable in engaging them across Indian organizations.

RESEARCH OBJECTIVES

1. To study literature related to employee engagement models.
2. To analyze the employee engagement drivers prevalent in the Industry.
3. To find out the most prevalent driver’s for today’s environment.
4. To find out the most suitable and prevalent model for today’s environment.

RESEARCH METHODOLOGY

Good research design will anticipate competing explanations before collecting data so that relevant information for evaluating the relative merits of these competing explanations is obtained. In this research the literature related to the topic will be studied and analysed to understand the approach of various organizations worldwide and the information collected will be the basis of generalizing the hypotheses. It will be a descriptive or analytical research design as this research approach is to study the prevalent employee engagement models in today's Industry.

LITERATURE REVIEW

Concept of Employee Engagement

The extent to which employees commit to something or someone in their organization, how hard employees work and how long they stay as a result of their commitment is known as employee engagement. Employers want employees who do their best work or 'go the extra mile'. Employees want jobs that are worthwhile and that inspire them. More and more organizations are looking for a win-win solution that meets their needs and those of their employees. What they increasingly say they are looking for is an engaged workforce.

It goes beyond job satisfaction and is not simply motivation. Engagement is something the employee has to offer: it cannot be 'required' as part of the employment contract. Engagement is distinctively different from employee satisfaction, motivation and organizational culture. Employee engagement was described in the academic literature by Schmidt et al. (1993). A modernized version of job satisfaction, Schmidt et al.'s influential definition of engagement was "an employee's involvement with, commitment to, and satisfaction with work. Employee engagement is a part of employee retention." This integrates the classic constructs of job satisfaction (Smith et al., 1969), and organizational commitment (Meyer & Allen, 1991).

Engaged employees care about the future of the company and are willing to invest discretionary effort. Engaged employees feel a strong emotional bond to the organization that employs them (Robinson,2004), which results in higher retention levels and productivity levels and lower absenteeism. When reliably measured, positive employee engagement can be causally related or correlated to specific positive business outcomes by workgroup and job type. Scarlett Surveys 2011, refers to these statistical relationships as engageonomics.

Employee Engagement Drivers

The top 10 employee engagement drivers that leaders must focus on are:

1. Confidence in the organization's future
2. A promising future for oneself
3. Organization supports work- life balance
4. Contribution is valid
5. Excited about one's work
6. Opportunity for growth and development
7. Safety is a priority
8. Leadership has communicated a motivating vision
9. Organization 's corporate social responsibility efforts increase overall satisfaction
10. Quality and improvement are top priorities

The four overall factors that consistently drive employee engagement are:

- Leaders who inspire confidence in the future
- Managers who recognize employees and emphasize quality improvement
- Exciting work with the opportunity for growth and development
- Organizations that demonstrate a genuine responsibility to their employees and communities

The Top Tens of Employee Engagement

The top10 ways to engage Gen X and Gen Y employees are:

1. **Recruiting.** Be straightforward and honest. Don't over promise and under deliver. Set clear expectations, clearly define goals, implement management development programs, and share organizational values and beliefs from day one.

2. **Meritocracy not hierarchy.** Consider changing the structure of your organization to a flatter model with less hierarchy and more rewards based on merit and performance, not tenure and title.
3. **Corporate citizenship.** They seek careers that allow opportunity for social significance.
4. **Outside the box benefits.** Adopt a variety of wellness programs such as flexible spending, paternity leave, adoption assistance, or health club discounts.
5. **Work life Balance.** If work can be done at home, or a conference call can be held while at a soccer game for their children, allow that flexibility.
6. **Coaching and communication.** Add a structured coaching or mentoring program to your organization. Communication often leads to innovation, increased trust, and engagement.
7. **Tap into technology.** Don't shy away from new technologies that help contribute to work life balance**.**
8. **Connectedness.** Gen X and Y need to feel connected to the organization to remain engaged, allow access to and input from your Gen X and Y non executive employees as well.
9. **Comfort with diversity.** Implement affinity groups, put forth diversity initiatives, change up the organization chart and add diversity to your leadership mix.
10. **Make it fun.** Gen X and Y expect to bring their full selves to work. Create a fun "bring your full self and be who you are" culture.

MODELS OF EMPLOYEE ENGAGEMENT:

1. **Kahn (1990)**

   Given the limited research on employee engagement, there has been little in the way of model or theory development. However, there are two streams of research that provide models of employee engagement. In his qualitative study on the psychological conditions of personal engagement and disengagement at work, Kahn (1990) interviewed summer camp counselors and organisational members of an architecture firm about their moments of engagement and disengagement at work. Kahn (1990) found that there were three psychological conditions associated with engagement or disengagement at work are meaningfulness, safety, and availability.

2. **Maslach et al.(2001)**

The other model of engagement comes from the burnout literature which describes job engagement as the positive antithesis of burnout noting that burnout involves the erosion of engagement with one's job (Maslach et al., 2001). According to Maslach et al.(2001), six areas of work-life that lead to burnout and engagement are workload, control , rewards and recognition, community and social support, perceived fairness, and values. Like burnout, engagement is expected to mediate the link between these six work-life factors and various work outcomes.

3. **Cropanzano and Mictchell, 2005**

A stronger theoretical rationale for explaining employee engagement can be found in Social Exchange Theory (SET). SET argues that obligations are generated through a series of interactions between parties who are in a state of reciprocal interdependence. A basic tenet of SET is that relationships evolve over time into trusting, loyal, and mutual commitments as long as the parties abide by certain "rules" of exchange (Cropanzano and Mictchell, 2005). Rules of exchange usually involve reciprocity or repayment rules such that the actions of one party lead to a response or actions by the other party. For example, when individuals receive economic and socio emotional resources from their organisation , they feel obliged to respond in kind and repay the organisation (Cropanzano and Mitchell, 2005).

4. **Black Box' model produced by Bath University**

The CIPD (Chartered Institute for Personnel and Development) report 'Creating an engaged workforce' considers some of the organisational issues that contribute to - or inhibit - employee engagement in different organisational settings. Employers want engaged employees because they deliver improved business performance. The high performance or 'black box' model produced by Bath University builds on the psychological contract but emphasises the role of line managers in creating conditions under which employees will offer 'discretionary behaviour'. The model recognises that employees have choices and can decide what level of engagement to offer to the employer.

5. **Employee Perception Survey (EPS) model**

   The EPS model of few companies is based on industry research (Corporate Leadership Council CLC Model of Employee engagement). EPS model, which is given below, measures the following:

Overall Engagement constitutes of six aspects

- Discretionary Effort
- Intent to Stay
- Advocacy
- Pride
- Good Company
- Emotional Commitment

16 Drivers which Impact Engagement

1. Manager Quality
2. Senior Executive Team
3. Day to Day Work – Resources
4. Role
5. Rewards
6. Work Life Balance
7. Org Culture
8. Innovation
9. Communication
10. Customer Focus
11. Diversity
12. Fairness
13. Team
14. Training & Development
15. Wipro Values
16. Health and Safety

Effect of Employee Engagement on Performance

An SHRM(Society for Human Resource Management) new global employee engagement study in 2006 surveyed 664,000 employees from around the world and found almost a 52% gap in the yearly performance improvement in operating income between organizations with highly engaged employees and organizations having employees with low engagement scores. Again, a meta analysis of over 7939 business units in 38 companies revealed the relationship between employee satisfaction, engagement and the business unit outcomes of customer satisfaction, profit, productivity, employee turnover and accidents (Nowack, 2006). Employee engagement has been linked to superior performance and higher levels of organizational commitment by a number of researchers (Woodruffe, 2006; Lockwood, 2006). Luthans and Peterson (2002) state that Gallup has empirically determined employee engagement to be a significant predictor of desirable organizational outcomes, such as customer satisfaction, retention, productivity and profitability. It was found that employees scoring high on engagement (top 25%) performed better in the areas of sales, customer complaints & turnover in comparison to the employees scoring low on engagement score (bottom 25%) (The Gallup Organisation, 2004).The Corporate Leadership Council (CLC) survey revealed that employee engagement leads to 57% improvement in discretionary efforts (Corporate Leadership Council, 2004). The CLC contends that emotional engagement has four times the power to affect performance as compared to rational commitment. In Japan, where only 9% of the workforce is engaged, the lost productivity is $232billion (The Gallup Organization , 2004). Engaged employees within an organization provide a competitive advantage to organizations (Joo& Mclean, 2006 Engaging employees especially by giving them participation, freedom, and trust is the most comprehensive response to the ascendant post industrial values of self realization and self actualization". Employee engagement has also been found to bring benefits at the individual level. A research was done by Britt, Adler and Bartone (2001). In a comprehensive review of literature on employee engagement, Stairs et al. (2006) point out that employee engagement has also been linked with higher employee retention (DDI, 2005; Harter, Schmidt and Keyes, 2003; Wright & McMahan, 1992), greater employee effort and productivity (Corporate Leadership Council, 2004), increased sales (HayGroup, 2001), greater income and turnover (Maitland, 2005; ISR, 2006; Harter et al.2003), greater profitability (Harter et al.2003), and faster business growth and higher likelihood of business success (Hewitt Associates, 2004).

CONCLUSION

HR need to become more dynamic and adaptive for unique category generation Y. Literature review and previous studies done in the context of Indian organisations highlight that while a lot of studies have been initiated and conducted in the cultural context, leadership and work values, almost minimal research has been initiated in the context of generational perspectives; whether multi-generational or with focus on a particular generational cohort. This is surprising given that with increase in life expectancy almost 3 generations (Baby Boomers 1945-1962, Generation X, 1963-1979 and Generation Y, 1980-2000)are working alongside in the work domain across major Indian organizations. Which means that if the majority population of a particular generation shares similar work values and preferences regarding work setting and characteristics, then it is bound to impact their expectations from the workplace in turn impacting organizational practices (specifically HRM practices) in managing and engaging such a new age workforce. HR need to become more dynamic and adaptive to reach all generations, but to identify ways to translate this into action, worldwide for unique category: Generation Y which is destined to dominate the work place in coming decade. The EPS model discussed in the study is based on industry research (CLC Model of Employee engagement). This EPS model, given is a very well researched and planned model of employee engagement and gives extensive drivers suitable to today's Gen Y to measure their expectations and engagement needs.

RECOMMENDATION

Engaged employees can help your organization achieve its mission, execute its strategy and generate important business results. This report has highlighted ways in which different HR practices, including job design, recruitment, selection, training, compensation and performance management can enhance employee engagement. These examples also show that employee engagement is more complex than it may appear on the surface. Organizations define and measure engagement in a variety of different ways, suggesting there is no one "right" or "best" way to define or stimulate engagement in your workforce. The decision to invest in strengthening engagement or commitment (or both) depends on an organization's strategy and the makeup of its workforce. For these reasons, it is vital to consider your own organization's view of engagement, as well as its strategy and workforce composition when deciding which HR practices will receive scarce investment dollars.

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ANNEXURE

Table 2: Generation Population World.

Generations	Population	% of World Population
Gen Y: 15-29 years old	1,723,911,077.00	25.47
Gen X: 30-44 years old	1,442951,791.00	21.32
Baby Booomers:45-64 years old	1,233,836.150.00	18.56
Traditionalists:65-74 years old	316,330,067.00	4.67

Source: U.S. Census Bureau, International Database, 2011

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CHANGING CONSUMER TRENDS IN RURAL INDIA: PERSPECTIVES, PRACTICES AND PROSPECTS

Jyoti Kukreja*

Rural sector which was once disdained by one and all due to the uncivilized and barbarian culture, amenities and demeanor has recently come into global limelight. It is consistently showing promising signs of shining in the near future. Once ignored, it is now receiving undivided attention and strong impetus from the government, various foreign and domestic companies. Right now, the urbane problem of work-life balance, home cooked food and cleanliness is a major concern that needs insightful solutions to be implemented. Foreign Brands like Maggi, Dairy-milk, Sunsilk, Fair-and-Lovely, etc. are coming to the rescue. They are becoming much needed. Rural Retail is vulnerable and thus, has abundant opportunities for the numerous market leaders. This paper shall seek to discuss the galore of opportunities to be explored in Rural India and challenges and roadblocks that calls for thoughtful answers

Keywords:

Ostensible Competition, Formatted Consumers, Labeled Customers, Aspirational Capability Challenges

*Assistant Professor, JIMS Kalkaji, New Delhi & Research Scholar, USMS, GGSIPU

INTRODUCTION

One fine evening as I was commuting via metro, an elderly man boarded from a station dressed in white Indian male attires. He wasn't clean shaved and smelled of cow dung. I observed that passengers could not bear the stink and started drifting away making him apparently isolated. This incidence draws my attention towards rural people. The literal meaning of 'Rural' stands to explain a market that is, under explored, less developed, where accessibility is scattered, where doubts and enquiries related to technology are plentiful, where people are more than means to an end, where existence is marked by both discomfort and inconvenience. Dictionary defines 'rural' as rustic, raw, unrefined, uncouth, hinterland. But the meaning of the word rural goes much beyond to what dictionary defines.

Adding to this twin perspective of political and economic, this is that part of the world where India's demographic dividend resides. These people have huge potential for development and contribute heavily to the GDP of the country. Their skills sets, if enhanced, can contribute phenomenally to the prowess of industries. This paper aims to establish both literal meaning of the word 'rural'; it is an attempt to make the readers and practitioners change their perspective by highlighting the promising prospects that this sector beholds. This is a thought- provoking piece of writing meant to orient new incumbents to embrace the concepts and fundamentals of this sector than to shun it.

From 'Bharat' to 'India'

Bharat is the Sanskrit name for the land of Mahabharata. The game of marketing is all about a war between the heart and mind. The crux of this amusement is the pocket share. It may be facile to influence but difficult to persuade, simpler to tell but hard to sell in the rural side of the country. The complexity in this multi-faceted world is constantly increasing. The opportunities exist in resolving confusions and facilitating decision-making amongst the copious brands that exist and throng the marketplace. The changes that are constant are paradoxical at times. The scope of development had been pioneered and sustained by the FMCG companies like HUL, Colgate-Palmolive, Philips, et al. With the execution of their developmental approach, the rural markets had been well nurtured by the agri-input marketers and government agencies.

The rural prosperity is the opportunity and an ethical onus for global marketers. The proposition is, 'Rural India as a growth driver for the future' rather than 'Rural India as an attractive market today'. The proposition also is, 'India as a separate unit for strategy development' in lieu of 'India as an extension market for global strategy deployment'. In conclusion, the objective is to leverage global competencies and knowledge of the company to create a winning 'Made for India Global Strategy' rather than leveraging a global strategy to create a new market. Inequality is increasing over time due to unequal distribution of resources in society.

Markets are seldom static. The total Indian market will reach a state of reasonable equilibrium where the difference between rural and urban markets will diminish. By the time such symmetry develops and stabilizes, marketers have two choices: to participate in the processes of change which means investment and proactive advancement of systems in tune with market response, or wait for changes to take place and then join the bandwagon when equanimity has been achieved. Rural markets will be playing a major role in company balance sheets whether in form of creditors or debtors to the company funds. The winners will emerge amongst early entrants who know the playing field best and have set the rules of the game during the evolution of rural markets.

Customer centric marketing for any brand means slicing and dicing the customer pie. This would mean that, the businesses needs to segment the customer population. This way, customers with the most potential of becoming buyers can be targeted. This way, the company can save on its resources and can aim its efforts only in the right direction. If someone were to sell a new high-end tractor in rural India, the target must not be the old farmer, but his son who has new thoughts and an open mind towards technology

Challenging development

Although rural India is filled with opportunities, tapping them is not an easy mission. There are various hurdles in the way of any corporate house that intends to bring its business into rural India. Much of the rural India remains a mystery. Communication is still an active trial with encountering about thirteen major languages and thirteen hundred dialects. Diversity in tradition and cultures surmount. Poor reach of mass media and shallow understanding of rural consumers is a challenge to be encountered.

- **Lack of effective education:** Rural educations benefits, although present and on an increase, are not exactly enough for the growth and development envisioned and desired by the nation's caretakers.
- **Not enough motivation:** Rural Indians, although becoming increasingly aware, are still not entirely in the light. They still have little to no faith in 'city products'. A trigger is enough to stimulate in them an aspiration to consume and once this is activated, the demand to climb and be at parity with the world is achieved.
- **Preferences:** Consumer demand in India is about a lot of people consuming a little and not about a small number consuming a lot. Though the wants and demands of the human race is uniform but the aspiration and preference pattern is dissimilar.
- **Aversion to technology:** A shift in mindset regarding the use of old technology to advanced technology with a local flavor promises a bright marketing strength. The objective of achieving efficiency by edifying low cost business model would deliver requisite business success.

GLOBAL OPPORTUNITIES @ GALORE

Although rural marketing is a tough cookie to crack, the opportunities and potential for growth is immense. Hence, with a mind to look at the positive side of things, we must remember what all we need to do, in order to work the rural market in just the right way.

- **Increase Consumer Perceived Value:** The idea is not to deploy low technology to deliver products with poor consumer perceived value at low prices. The objective is to use first rate consumer insight and sophisticated business process thinking, to innovate products which have high consumer perceived value, delivered via low-cost business system.
- **Consumerism:** It is the next big leap in this rural market owing to the expanding middle class.
- **Inculcate brand awareness and brand following:** The rural populace needs to be made aware about the brand, and how it will help them in developing their quality of life. The ease which can be brought to them with the help of the brand needs to be communicated to them.
- **Probe in and profile the consumers:** All customers are not the same and neither are their pressure points. Each and every person of the rural populace has different sets of needs and requirements. The company which intends to market its product in rural India, must segment the population and target the group that is most likely to buy its products.
- **Return on Investment:** Deliver 'value for money'. The Indian market is 'price sensitive' viz-a-viz 'quality conscious'. Therefore, the company must be very sure that the prices it has attached to its products and services are fair and genuine.
- **Visual Delight:** Visual Merchandising and store design must be kept in mind while working with Rural India. The customer is a highly visual creature. Without a pretty picture presented to him, he won't budge.
- **Growing Purchasing Power:** Commercial agriculture has revolutionized this sector. It has augmented productivity and income manifold. This is because contract for production of crops, livestock, fisheries, etc. is enclosed between the buyer and seller. The farmers are assured of markets for their harvest/products. Cereals production of rice, pulses, spices, juice, etc. is a growing market.
- **Processing of Honey making (Beekeeping):** Processing of fruits and vegetables has a wide market and skill that is elusive in urban areas now. Rural areas, where people still believe in seeing the process resulting into the final product right in front of their eyes can be the step-up this industry needs.
- **Flora and fauna:** For export markets, tea leaves, coir mats and artisan is a labor intensive job of rural entrepreneurs. Incense sticks, crackers, handlooms, wood carvings, iron and steel

manufacturing, leather goods and varnishes can all be some excellent ways of tapping rural India.

- **Restaurant & Catering Business:** With each working day now surmounting in the monetary value, the need and relevance for hygienic food is on the rise and in addition to the constraint of time to prepare food as increasing number of women are working outside the home. The segment is gradually set to follow the principle of division of labor that is specialists doing the job and outsourcing would be a norm soon. Aping the west due to foreign tourism has sown the seeds of booming of diversity. Other than that, the quality dimension has been added to the organization of festivities and special events.
- **Retail would now have strong hold on the buying phenomena.** This is due to paucity of time and unlimited aspirations to be met assortment under one roof would be a requirement. Packaging of the products is being paid greater attention.
- **Beauty care and Healthcare Clinics now indispensable.** The rural consumers are now gradually escalating the need hierarchy pattern. Self-esteem with looks has now become an integral part of the evolving society. For instance, young girls in rural area don't just rely on homemade coconut oil, but also on the serums and conditioners they buy from the nearest cities.
- **Increasing Aspiration Levels:** According to Nielson, the demand for personal care product in areas registered a higher growth rate than in urban areas. ASSOCHAM published a study titled 'The rise of Rural India' which guess-worked rural retail market at around US$112 billion.

Is the rural phenomenon temporary?

There definitely had been an upsurge in the income level of the rural households but is it a cause of inflation or the increased productivity, the facts needs to be further scrutinized. As per Adi Godrej, "The rural consumer is discerning and the rural market is vibrant. The market is not sleeping any longer. We are." 'The real India lives in the villages.' This sunrise sector is shinning. Rural markets are 'no-where' to rural markets are 'now-here'. New approaches, new strategic alternatives and new operational techniques are being evolved to gain competitive advantage. The urban markets have reached saturation and margins are under pressure. The export markets suffer from inadequate infrastructure back home and uncompetitive prices overseas. Thus, rural markets are going to turnaround the game of marketing.

Rural India is changing so is the rural populace. Noted scholar Lin Bao had said, "While North America and Western Europe have been titled the 'cities of the world', then Asia, Africa and Latin America together make up the rural areas of the world." Today if these emerging economies are the hope of the world, villages are drivers of their own economy. With saturation in demand in urban centers coupled with the impact of the global economic crisis on the urban middle class, marketers have been forced to relook at the hinterland pastures. Rural consumers are fundamentally different from their urban counterparts. Following are the aspects that differentiate the two:

Problems with rural marketing

Why is rural such a discounted reality? Why is it that even before we pry we decide not to try? Just the definition of rural, up until now has been enough to drive us away from Rural India. More and more people have migrated from rural to urban. As the years went by, urban has now become completely saturated and simply has no scope left. You can't expect to sell a smartphone in a city like Delhi, until and unless your product really has something special and unique to offer. Brands who are not innovators, but mere imitators won't get very far in such a market. This is where rural enters the picture. Rural is like an untouched goldmine simply sitting, and waiting for the right miner to see, realize and tap its core.

Opportunities abound and invite innovative strategies in the rural market. How global strategies are implemented and dovetailed in the marketing plans.

In a Wharton Study Report on rural consumption in India, Jagmohan Singh Raju, a Professor at Wharton, notes, "No consumer goods company today can afford to forget rural market. You can't build a presence for a brand in India unless you have a strategy for reaching the villages."

According to MART-the research firm which helps the corporate sector with rural strategies-says that today rural India is buying over 45% of all soft drink, 50% of motorcycles and 55% of durables and cigarettes. The current size of rural market for FMCGs, durables, auto is an estimated USD 2 trillion, overall rural accounts for half of India's income and spending.

In 2008, McKinsey survey suggested that by 2020, market in rural India with a population of 600 million will grow four times its sie of US $577 billion in 2007. With rural incomes now increasing rapidly and fast electrification of rural homes under 'Bharat Nirman' scheme, the opportunities for the marketers is immense.

Solutions and Suggestions

The solution to the jigsaw that is rural, involves looking beyond the lens of conventional Indian schemes. While we can say that business is all about communication, but transcending the same message effectively in an environment of low literacy and an archaic mindset has been slighted today with local recruitment and training sessions imparted.

- **Meager means to livelihood:** The subsistence culture of this part of the world is highly prominent. The opportunity exists in revolutionizing it with its charm of global prestige.
- **Focus on improving the quality of life of the rural folk:** Rural Indians, although advancing nicely, are still somewhat stuck to the archaic ways of life. Rural marketing can be an excellent solution to that.

- **Marketers must Research extensively.** The marketers must research on the consumer-buying behavior extensively which consist of qualitative and quantitative studies. For example: brand awareness, attitude, media habits, pricing strategies, usage and its impact in the rural market.
- **Diminish the urban-rural disparities by pocket- analysis.** With the increasing level of income of the rural population the income disparity level between the rural and urban population has narrowed down. One rupee and 50 paise shampoo sachets or five rupees soap of lux meets the essential requirement and an everyday used luxury becomes an unstated need thereafter. The four rupees cream 'fair and lovely' meets their need for fairness. The availability of the same set of product at both urban and rural area, diminish the divide and levels the disparity.
- **Target the Segment:** Villagers today are using Cinthol, etc and toothpaste even when they can use locally manufactured low price products. This depicts that Indian customer is not price sensitive, but wants value for money. They are ready to pay premium for the product if the product is offering some extra premium.
- **Understand Cultural Sensitivity and Social Values:** Cultural values and social pulse play a key role in deciding what to buy and when and from whom. Emotional links influence the rural people.
- **Acquiring Indian Brands:** Indian brands has led to penetrate the market easily and rapidly. e.g. Electrolux's acquisition of Indian brands Kelvinator, Allwyn, has leveraged with strng distribution system. 'Chouko nahin Chamko'.
- **Product differentiation and/or innovation aligned with geographical segmentation:** Different product categories for various usage patterns and literacy levels. For example, Nokia entry level handsets have features like torchlight and dust-resistant keypads cater to the rural needs. Moreover, it offers local language interface in nine Indian languages to facilitate non-English rural consumers.
- **Understand the rural realities and perceptions.** This is quintessential for the appreciation of diversity that is inevitably an inherent component of it. Untangling rural beliefs and value system that cause more of feud and harm to the society is a social onus on the glocal brands.
- **Seri-culture, horticulture and cleanliness drives:** All of these have a huge scope which can only be achieved in rural India.
- **Employment Assurance Schemes:** Rural Indians still have very little trust in city-centric companies. Such assurance schemes will go a long way in increasing their confidence levels.
- **Communication:** It is the vital element of rural marketing. It should serve to sort out social conflicts, encourage cooperation and build a competitive spirit during face offs between rural and urban, and also within rural areas. Another critical point for communication is the point of conversion of ruralite from an 'induced beneficiary' to an 'autonomous buyer'.
- **Brand Personification:** Building brand which are easy to memorize, understand and associate and distinguish.

- **The aim of buying a brand should be clear.** This is because brands ensure quantity and quality consistency with repeated purchase anytime, anywhere availability.

EFFECTIVE BRAND NAMES

Rural Indians who are largely simple and literal beings, won't be attracted to a brand name they can't even pronounce, much less understand. The company must keep it in mind while trying to market its product in rural India. Permutation and combination of Marketing Mix is under the IMC model must focus on re-engineering marketing communication must focus on mass consumption. Many of the foreign brands that target mass consumption have their tagline in local language. E.g. Coca-Cola: 'Aaj tu jashn mana le', or Cadbury's: 'Kuch meetha ho jaaye'.

Principle	Explanation	Example
Simple to memorize	Short, concise and facile to read, pronounce, and remember	Vim, Tide, Surf, Rin, Colgate, Pepsi
Easy to Associate	Understandable and implies features and functions of the product	Everyouth, Fair & Lovely, Hair & care, Head & Shoulders

CONCLUSION

From the study, it can lucidly be concluded that, Rural India represents a raw diamond that is simply in the need of a good, thorough clean. With some efforts from the government, along with various companies interested in tapping rural, this region can be a complete hit on all fronts. Up until now, it has not been deemed fit by companies, due to a very archaic view of rural, but now; various parties across the globe are realizing the potential of rural India. The rural consumer is also changing. It is now gradually getting over its apprehensions about "city brands". The rural consumer is becoming slowly modernized and ready to go digital in the near future. By facing some of the challenges this region presents, any company can easily reach new height, by using rural as its incubator.

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WINDS OF CHANGE: A CASE STUDY

Dr B N Balaji Singh*
Ravi.K.R**
Brijesh Singh**

Education entrepreneurs are a new breed of innovators whose characteristics and activities lead to the transformation—not merely the slight improvement—of the traditional education system. This case study captures the growth of PES Institute of Technology (PESIT), now PES University, a distinguished technical institute with humble beginnings in 1988. It ranks among the top engineering schools in India today. This case study is an attempt to capture the educational entrepreneurship of Prof. D. Jawahar (fondly known as DJ), Pro Chancellor PES University, which was instrumental in the growth of PESIT. The case study also attempts to dwell on the competencies that are demonstrated by the educational entrepreneur Prof. D. Jawahar in strategic problem solving; data-driven planning and decision making; effective leadership and motivation; identification of priorities; and techniques of persuasion, influence, and negotiation that has led to transformation of delivery of technical education. These competencies may act as guidelines for the scores of those institutions aspiring to be in the major league.

Keywords: Education, Entrepreneurs, Competencies, transformation, leadership, Delivery

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*Dean – Faculty of Management, Department of Management ,PES University, Bangalore, Karnataka, India .
**Assistant Professor, Department of Management Studies, PES University, Bangalore, Karnataka, India.

THE DAWN OF AN ACADEMIC INSTITUTION OF EXCELLENCE

Late afternoon on the 5th February, 2013, Prof. D. Jawahar, CEO, PES Institute of Technology, had just heard that the Honorable Governor of Karnataka, India had given assent to the PES University Act, 2012. Prof. D. Jawahar was jubilant to hear the news and quickly in his official chamber, began to look at the challenges ahead of him. PES Institute of Technology was affiliated to Visvesvaraya Technological University (VTU) and now had move away from being a constituent college, to a separate university. The responsibility was enormous; the credibility of the new university had to be established in a short span to satisfy all the stakeholders. Prof. D. Jawahar also knew that some stakeholders were critical of this new development. Prof. D. Jawahar understood the enormous responsibility he carried on his shoulders, but was not deterred because he had faced such challenges all along the process of building PES Institute of Technology from scratch.

PES institutions had a humble beginning in 1972, in a rented gymnasium in Bangalore, with just 40 students. Dr. M. R. Doreswamy, founder of PES institutions established the Pre-University College in 1972.With his untiring commitment and single minded dedication he made it a success in the local community. This was followed up with introduction of several other courses namely Bachelor of Commerce (1980), Diploma of Pharmacy (1982), Polytechnic (1983) & Bachelor of Science (1984). He started with Bachelor of Engineering (1988), Bachelor of Business Management (1994), Master of Computer Applications (1997), Master of Business Administration (1997) and the Master of Science – Microbiology (1998) under PES Institute of Technology.

THE WAY FORWARD

In 1991, Prof. D. Jawahar returned to India from US and started managing the performance of PESIT, an institution his father Dr. M. R. Doreswamy started in 1988. PESIT was far from being a favored destination for students. The student intake of PESIT was through a state government conducted entrance test known as Common Entrance Test (CET) and the ranking of PESIT was abysmal, out of the 56 Technical (engineering) Schools in Karnataka, PESIT was ranked 54!!

Prof. D. Jawahar looked at the how PESIT was ranked at the CET and decided that the only way forward was to move up the CET ranking. His first challenge was to attract quality faculty to teach at the PESIT. Prof. D. Jawahar realized that students were attracted to the institution on the basis of faculty who were teaching in the institution. He made of list of well known faculty in the field of engineering and technology and called on them to join PESIT. His efforts paid off and he was able attract some renowned faculty members to PESIT. Having got good faculty into PESIT was the first step in the process of institution building. The next step was the implementation of Student Academic Support Program (SASP). This program was initiated to improve results in the university exams of students enrolled. Teachers focused on teaching methodologies that help them to improve students' examination results. The results of the first few initiatives improved enrollment to 60%; results to 70%, but placements were 0%.

THE ACTION PLAN

The next step was to improve the teaching learning process. Prof. D. Jawahar realized the huge gap existing between the processes at PESIT and any top engineering school in the world. He knew that improved processes will enhance the teaching and learning experience, hence the student quality. He initiated CWQIP, Campus-wide Quality Improvement Program (akin to companywide quality improvement program). CWQIP's main purpose was to frame quality processes so as to increase the effectiveness of each of the stakeholders while rendering/receiving services. CWQIP had 6 pillars

1. Classroom Management
    a. Course Information: All the information on each of the courses to be made available to the students before the actual start of the classes.
    b. Teacher's evaluation: A formal feedback mechanism which involves appraisal of a teacher. Generally a teacher is appraised on ART (Administration: 20%, Research: 40% & Teaching: 40%) parameters. An important input in the teacher's appraisal was the students' feedback in which the students rated their teachers on various parameters like teaching effectiveness, clarifying doubts raised by the students, coverage of the syllabus etc.
    c. Progress report Services: Student and parents were provided with a consistent progress report of their wards through online monitoring system called e-sims later changed to GEMS.
2. Performance Incentives:
    a. Scholarship Awards: Deserving students were awarded with scholarships.

This initiative of PESIT has become a huge success today. Presently top 20% of the students are being awarded with Prof MRD scholarship, comprising 25% of their total tuition fee waiver. This year this amount was equivalent to INR 10.2 million. Few organizations have also instituted merit Scholarships at PES University, prominent among them are SAP Student Scholarship, Meritor Scholarship, Cognizant foundation Student Scholarship.

    b. Student Assistantships: Students were allowed assistantships under a professor at the Campus at a nominal incentive.

3. Industry Institute Interface: Objective was to provide practical exposure to students and enhance the quality and quantity of placements. Recently PESIT has established "Lean Manufacturing Consultancy cell" (Only one of its kind in India by a department, recognized by Ministry of MSME Govt. of India) and an incubation centre also recognized by the ministry.
4. Bridge Course and Technical activities
    a. Equipping student with soft skills through Personality Development Programs
    b. Imparting technical skill set including C++/VLSI/Advanced Microprocessor etc
    c. Technical Fests like Techniche, Vistas, Manitec
5. Student mentoring systems.
6. Audit Team: PESIT formulated Department of Strategic initiatives, headed by Dr. B. N. Balaji Singh, mainly for monitoring compliance in processes through regular audits.

The result of this initiative was that enrollment improved to 80%; results in the university exams to 75% and placements were up to 10%.

RESPONDING TO MARKET DEMAND

Indian economy was on an upswing and having laid the foundation of strong processes. Prof. D. Jawahar wanted to focus on enhancing the quality of students and placements. He knew that quality of students and placements are interdependent factors. Good placements will increase the quality of input student and with better student intake the placement scenario will improve further. Hence the next initiative was focused on improving placements and the quality of students through Total Student Development program (TSDP). He initiated this by consulting Dr B N Balaji Singh, then executive director NTTF. Both of them decided to meet the HR Managers of different organizations to understand the requirements of the industry. After having sufficient meetings with corporate leaders and HR managers they understood that the biggest challenge was employability skills i.e. graduate students lacked both the technical knowhow and soft skills required to excel at work. They knew that the employability skills can only be improved by imparting training and not more knowledge.

To make students more employable, Prof. D. Jawahar decided to launch PPR, Placement Process Reengineering (a term coined in line with BPR, Business process re-engineering, a very familiar term in Corporate India, revered by most of the HR managers). PPR was designed as an initiative to provide industry ready students to corporate India. The plan was to train the students of Bangalore

City (not only PESIT) in employability skills and then present them to the companies for a final recruitment and selection process. This was an astute decision, because the training, if successful, would generate a lot of positive Word of Mouth for PESIT in both corporate world and academia. To make PPR a success, Prof. D. Jawahar and Dr. B. N. Balaji Singh organized a get-together of HR Managers at a 5 star premium hotel property, ITC Windsor Manor, and presented their plan to them. The HR managers were supportive of the plan and assured recruitment of deserving candidates.

Prof. D. Jawahar decided to go ahead with this initiative with a controlled group of students. Dr V. Krishna, Professor of Mechanical Engineering Department, was selected as a coordinator for this program. 40 students were selected for the training after a brief aptitude test and an interview. They were imparted with C++ training by Mr Vijayan, a renowned authority on C++, and soft skills training by Dr. B. N. Balaji Singh. The training was conducted in line with the expectations of the corporate and at the end of the training different events like debates, declamations; group discussions were conducted to showcase the impact of training. Few HR managers readily accepted to be the part of the judge's panel for this event. The event was a mammoth success and HR managers, true to their promise, not only appreciated the skills of the students but also recruited the deserving students to their organizations. The event generated a lot of positive WoM for PESIT and proved to be a good brand building exercise.

This initiative improved enrollment to 100%; results to 80%; and placements to 50%.

Prof. D. Jawahar recognized the impact of good placements in a top engineering school. He designated Dr. K. S. Sridhar as the Head of Placements at PESIT. Dr.Sridhar is a man with excellent oratory skills and a charismatic personality. With Prof. D. Jawahar's help and guidance he transformed placement scenario at PESIT. The next initiative for the growth of PESIT is being characterized by continuous focus on placements and initiating "Industry on Campus Program". Industry on Campus Program (IOCP) involved engagement with industry so as to increase the Projects, internships, hands on learning experience of the students. As a part of IOCP, Prof. D. Jawahar and his team launched the following programmes:

1. ISD/T (Infrastructure for Software Development/Training)

In this scheme reputed organizations in Bangalore were encouraged to set up their main/extended offices in the state of the art PESIT campus at a nominal rent. In return the organizations were expected to expose PESIT students to their projects through seminars and hands on experience. Quite a few organizations showed keen interest in this initiative and some reputed organizations like Kshema Technologies, Edurite, Campus Logic, Televital etc signed an MOU with PESIT for ISD/T scheme. This opened new avenues for fruitful engagement with the industry.

As an extension Prof D. Jawahar has set up a R & D lab entitled CORI (Crucible of innovation and research) on the campus engaging the best of talent from leading labs in India where active research is being carried out. The multidisciplinary research focus at CORI includes:

- ✓ Satellite Technologies
- ✓ Signal Processing
- ✓ Center for Research and Engineering in Sensors Technologies
- ✓ Embedded Systems Engineering
- ✓ Advanced Composites Research Centre (ARC)
- ✓ Centre for Automobile Research & Engineering (CARE)

2. Projects/Internships/seminars/conferences/workshops

Students' engagement with the industry was crucial for the success of IOCP. Students were encouraged to intern with premier MNCs so as to improve on their practical exposure. Seminars, conferences and workshops from the industry regarding the latest trends were conducted on a regular basis and the gap between the academia and industry was bridged significantly. Further a centre called Ordell Ugo is set up on campus to encourage research by students during spare time wherein 100 projects can be taken up at a time. The students have produced world class projects which have been published /presented. These measures helped in improving enrollment to 100%; results to 85%; placements to 80%.

PESIT was growing and the management team was expanding. Prof. D. Jawahar was looking out for an academic stalwart who understands the processes and has a charisma to run the institution as a Principal of PESIT. Dr. K.N. Balasubramanya Murthy was selected for this position. Dr. Murthy has B.E. from Mysore University and M.E. from IISC, Bangalore. He finished his Ph.D. from IIT Madras and spent 6 months in US at New Mexico State University, Las Cruces on a project. His entry into the PESIT family further bolstered the strength of the management team. Later, Dr Murthy was chosen as first Vice Chancellor of PES University.

Dr. Murthy entry marked the next phase of initiatives focused on quality research. During this phase the number of Doctorates on the campus increased from 7 to 117. PESIT encouraged publications; this initiative helped faculty to publish in International Journals and National Journals. The number of publications in International Journals was 76 and National Journal was 101 by the end of 2012 and PESIT had applied for 5 patents. PESIT collaborated with leading Schools, universities and companies across the world and launched student exchange programs.

PESIT has introduced computer based on line tests, all lectures are captured live on video from each class room to be available to students (later on to general public).

As a result of these initiatives today:

- PESIT is ranked #1 in Karnataka by DataQuest
- PESIT is ranked 4th in Placements in India according to DataQuest
- PESIT is placed 7th on the list of India's most trusted educational institutes by TRA
- PESIT is in the list of top 25 M.Tech colleges in India by CareerIndia.

FUTURE DREAM TO BE A WORLD CLASS PLAYER IN THE EDUCATION FIELD

Prof. Jawahar aspired to make PES University among the top 10 Universities in India by 2020. He believed that this was possible by focusing on third intervention called SPIRIT which had 6 key parameters, namely:

- Students
- Process
- Identity
- Research
- Infrastructure
- Teachers

With all these initiatives PESU wants to be a global player in the education field.

ANNEXURES

ANNEXURE 1

PPR Framework

Identify students securing more than 60% in the first 3 semesters of engineering

↓

Conduct Aptitude test for 1000+ students along with the industry in their 4th semester

↓

Select 120 students through test scores and Interviews

↓

Shortlist 100 students – 20 for each of the 5 organizations in the beginning of their 5th semester

↓

Train for 10 months at PESIT

↓

Present for Recruitment at the end of the 6th semester

↓

Selected students do their project work in the companies for their 7th and 8th semester

↓

Students to join that organization after the course is over

ANNEXURE 2: STUDENT CLUBS AT PESIT

- ✓ Sequitur : Annual science fest organized by the students of Science and Humanities Department.
- ✓ Celesta : College cultural day.
- ✓ Vistas : National-level management fest.
- ✓ Conquiztador : The Annual High School Quizzing Championship for the Dr. M R Doreswamy Trophy for Quizzing Excellence.
- ✓ Ayana : A 24-hour hackathon organised by the students of Department of Computer Science.
- ✓ Aatmatrisha : The annual intercollegiate techno-cultural fest of PESIT
- ✓ Samarpana :An annual event dedicated to the martyrs of our nation.
- ✓ HashCode : A 24-hour hackathonorganised by Student Nokia Developer Community.
- ✓ DebSoc - The Debating Society of PES University.
- ✓ Nautanki - The college's official dramatics and film making team.
- ✓ PES Talkies - Pesit's exclusive club for intellectual discussions.
- ✓ Ninaada - Indian cultural forum
- ✓ Fantom - Western music band
- ✓Trance - Western Contemporary dance troupe.
- ✓ Ducks - Hiking and mountain climbing club
- ✓ The Quotient Quiz Club - The official quiz club of PESIT.
- ✓ Team Haya - Formula racing team.
- ✓ Team Aeolus - Aero-design team.
- ✓ Pixels - Photography Club.
- ✓ Eclat- Annual magazine by and for the students.
- ✓ Homebrew Club-A Club dedicated to helping bring people who love hardware and work on hardware together.
- ✓ PES Open Source community- The group working on promoting the use of Free and Open source software.
- ✓ Student Nokia Developer- A community working towards researching and developing apps/games for Nokia Devices.
- ✓Papyrus- Monthly newsletter by students.
- ✓RCP - Rotaract Club of PES University- Team committed for 'Enlightening Human Lives' by undertaking various Social Responsible Activities.
- ✓PES E-Cell - organisation run by students that aims at manifesting the latent entrepreneurial spirit of students. According to an estimate there are close to 15 start ups run by students of PESIT

ANNEXURE 3

PES University has a built up area of 86,473.11 Sq Mts. The areas of different blocks are mentioned below:

Sl. No.	Description	Total (Sq. M)
1	'A' Block	10,925.667
2	'B' Block	6,000.000
3	'C' Block	2,392.322
4	'D' Block	2,641.38
5	Tech Park	11,826.227
6	Panini Block	12,076.324
7	'G' Block	7,110.207
8	General Work Shop	2915.59
9	Food Court	890.657
10	MM Block	2089.276
11	Mess Block	1,189.105
12	I.H.Block	4,835.49
13	Entrance Block	499.00
14	New Hostel Block	7991.00
15	New Hostel Block Annex	1497.00
16	IT Block	2761.21
17	Girls Hostel	4181.00
18	Central Security Office	67.85
19	Multi Level 2 Wheeler parking & Research Labs (Nokia Lab, Cisco Lab & Social computing Lab and Canteen	3856.00
20	Physics & Chemistry Lab	212.40
21	Fitting and Foundry Lab	161.40
22	Sewage Treatment Plant (STP)	354.00
	Total	86,473.11

ANNEXURE 4

Library Details

Books	**89,915**
E-Books	16,165
Print Periodicals	350
E- Journals	6,197
Bound Volumes	3,263
Project Reports	1,414
CD-ROMs	6,711
Total Library Area in sq m	422 sq m
Reading Room seating capacity	250
Reprographic Facility	Available
No. of Multimedia PCs and Digital Library facilities	22/Available
Library Networking	Yes Done
Current Annual Budget	INR 7.5 million

Annexure-5

Patent Filed

#	Applicant Name	Title	Patent Filled on	Application No.
1	Dr.Roshan Makam	Protein Structure Prediction	29.01.2014	402/CHF/2014
2	Dr.Roshan Makam	A Process of production and extra-cellular secretion of lipids	12.09.2013	5134/CHE/2013
3	Dr.Niranjan Krupa	A Monitoring Device for Measuring and Mapping Physiological and Psychological Parameters	25.10.2013	4808/CHE/2013
4	Dr.C.S.Ramesh	A Plunger used for briquetting tool plunger application, a composition and a method for coating the composition onto the plunger	06.01.2014	6054/CHE/2013
5	Dr.J.Manikandan	Digital Circuit Emulation and Simulation using support vector machine (SVM) Classifiers	09.07.2014	3410/CHE/2014

Annexure 6

PESIT/PESU - MoU's signed with University & Industry

#	UNIVERSITY	Contact Person
1	Knowledge Incubation for Technical Education (KITE) Centre, IIT, Hyd	Director, IIT Hyderabad
2	GE India Technology Centre Private Limited Bangalore – 560 066.	Mr.Sukla Chandra, General manager GE Global Research
3	NOKIA Coroporation Finland	Mr.Chidambaran K, Director Sowmya B, Project Mangaer
4	EMC Data Storage Systems (India) Pvt. Ltd Bangalore – 560048.	Mr.Shrinivas Kulkarni Head – Business Finance & Mr.Arumugam Saravanan, SVP and MD
5	Bournemouth University, Poole BH12 5BB, UK	Prof.John Vinney, Vice-Chancellor
6	Axiom Research Lab Private Limited, Noida - 201301, India	Mr.Rahual Narayan, Team Lead
7	MANN AND HUMMEL FULTER Pvt., Ltd., Bangalore – 560 058.	Mr.Thomas Luck, Director, Service Center, NHIN & Mr.Kumar Ramaiah, Manager – IF Eng.
8	Binghamton University, State University of New York, NY 13902, USA	Amanda E Bailor, Dr. Hari
9	Emerging Vehicle Technologies LLC (EVT) Georgia 30071, USA	Mr.Richard Harmel Director, EVT
10	ECD Global, Bangalore.	Mr.Kiran Shanmugam, CEO
11	Aspect Ratio Engineering Services Private Limited Bangalore – 560085.	Mr.Govindarajan Viswanathan, CEO
12	Innovent Engineering Solutions Pvt. Ltd, Bangalore – 560 038.	Mr.B.Sivasubramaniaan, CMD
13	DISA India Limited, Peenya II Phase, Bangalore – 560058.	Mr.Viraj Naidu, Managing Director
14	Conceptia Software, BSK III Stage, Bangalore – 560085.	Mr.Anil Das N T, MD and CEO
15	Rapid Global Business Solutions India (P) Ltd. Hosur Road, Wilson Garden, Bangalore – 560 027.	Mr.Alok. Purohit Director

#	UNIVERSITY/COMPANY	Contact Person
1	National Taipei University of Technology, Taiwan	Mr.Leehter Yao , President
2	Indian Institute of Technology - Bombay	Prof.Devang Khakhar, Director, IIT-Bombay
3	Dalhousie University, Halifax, Nova Scotia, Canada	Dr.Carolyn Watters, Vice President Academic and Provost
4	Nanhua University, Taiwan (R.O.C)	Dr.Lin, Tsong-Ming, President
5	Missouri University of Science and Technology, USA	Mr.Warren K Wray, Vice Chancellor for Global and Strategic Partnerships, MUST
6	North Dakota State University, ND 58102. U.S.A	Mr.Lisa Haunk, Director, Office of Global Outreach
7	Principal Secretary to Government, Education Department Government of Karnataka	Dr.Bharat Lal Meena, Additional Chief Secretary to Government Education Department (Higher Education)
8	ENTI Innovations PVT Ltd, Bangalore – 560 051.	Dr.Ranga Raddy, CEO & Founder
9	Mission Aerospace Foundation of India, Bangalore – 560 001.	Mr.Arunakar Mishra, Director & Member of Governing Board
10	Peenya Industries' Association, Peenya Industrial Estate Bangalore – 560 058.	Sri D T Venkatesh, President
11	MAGMA Engineering Asia Pacific Pvt Ltd, Hyderabad	Mr.Mohamed Ismail Khan, Sales Manager India - Sigmasoft
12	Siemens Technology & Services Private Limited, Mumbai	Dr.Mukul Saxena, Senior Vice President & Heand Corporate Research & Technologies – India

ANNEXURE 7: Growth in student Intake Y-o-Y

#	Year	Departments										
		ME	ECE	CSE	MFG	ISE	TCE	BT	EEE	CE	MCA	MBA
1	1988-89	40	40	40	-	-	-	-	-	-	-	-
2	1989-90	40	40	40	-	-	-	-	-	-	-	-
3	1990-91	40	40	40	-	-	-	-	-	-	-	-
4	1991-92	40	40	40	-	-	-	-	-	-	-	-
5	1992-93	60	60	60	30	-	-	-	-	-	-	-
6	1993-94	60	60	60	30	-	-	-	-	-	-	-
7	1994-95	90	90	90	30	-	-	-	-	-	-	-
8	1995-96	90	90	90	30	-	-	-	-	-	-	-
9	1996-97	120	90	90	60	-	-	-	-	-	-	-
10	1997-98	120	100	100	60	-	-	-	-	-	30	40
11	1998-99	120	100	100	60	60	-	-	-	-	45	40
12	1999-2000	60	120	120	30	60	60	-	-	-	60	60
13	2000-2001	60	120	120	30	90	90	-	-	-	60	60
14	2001-2002	90	120	120	-	120	90	-	-	-	90	60
15	2002-2003	90	120	120	-	120	90	30	-	-	90	90
16	2003-2004	90	120	120	-	120	90	30	-	-	90	90
17	2004-2005	120	120	120	-	120	90	60	-	-	120	120
18	2005-2006	120	120	120	-	120	90	60	-	-	120	120
19	2006-2007	120	120	120	-	120	120	120	60	-	120	120
20	2007-2008	120	120	120	-	120	120	120	120	-	120	120
21	2008-2009	120	120	120	-	120	120	120	120	-	120	120
22	2009-2010	120	120	120	-	120	120	120	120	-	120	120
23	2010-2011	120	120	120	-	120	120	120	120	-	120	180
24	2011-2012	180	120	180	-	120	120	120	120	-	120	180
25	2012-2013	180	120	180	-	120	120	120	120	120	120	240
26	2013-2014	180	120	180		120	120	60	120	120	120	240
27	2014-2015	180	120	180		120	120	60	120	120	120	240

*Intake for Bachelors of Hotel Management, Bachelor of Business Administration and M.Tech courses are not included

ME: Mechanical Engineering
ECE: Electronics and Communication Engineering
CSE: Computer Science Engineering
MFG: Manufacturing Engineering
ISE: Information Science Engineering
TCE: Telecommunication Engineering
BT: Bio Technology Engineering
EEE: Electrical and Electronics Engineering
CE: Civil Engineering
MCA: Master of Computer Applications
MBA: Master of Business Administration

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Compiled by:

Manish Anand

Librarian

Prestige Institute of Management and Research, Indore