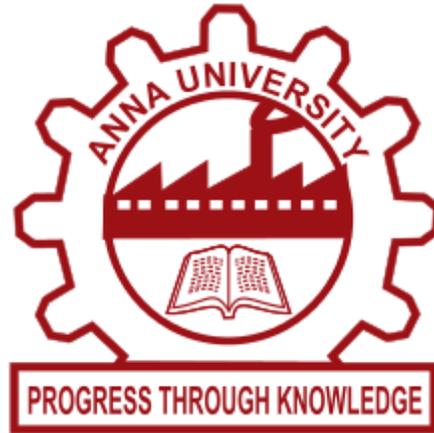

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Madurai Regional Campus

**Entrepreneurship and Management:
Innovative Construction Techniques and Ecological
Development. *Vol. 1 Management Part II***

Editor: Prof. Dr. C. Swarnalatha, Ph.D.

Assistant Editor

N.VIVEK, B.A (RBP), B.Com, MBA, UGC NET, MISTE

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**Implementation of Six Sigma as an Innovative Technology in
Business Management with Special Reference to Education Domain**

A.P. Arul Jeevaraj, M.Sc., MBA and Prof. Dr. S. Raju, Ph.D.

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Abstract

Six Sigma is a technique used to control quality. In too many companies six sigma is used as a tool for measuring the quality with continuous improvement also looking for the perfection in their organization. Main focus of **Six Sigma** is to deliver world-class performance, reliability and value to the end customer. This study is mainly done for improving overall quality of Education Management in and around Madurai zone, for this we selected both engineering and arts colleges in and around Madurai. **Six Sigma** in education is divided into Primary and Secondary factors. The Primary factors included are, Teaching and Researches and then the Secondary factors are Administrative function, University coordination and supporting activities. This survey was conducted with Management, Faculty and Students in Education Management to know their service standard and present education quality. The sample size of my project is 150 and researcher selected 1 management staff 4 faculties and 15 students from every college. In this project research used simple percentage, bar chart and graph and DMAIC (Define Measure Analysis Improve and Control) METHODOLOGY used to improve and control the quality of Education Management. Researcher also suggested that the institution can also concentrate with University Collaboration, knowledgeable curriculum, extra transportation facilities with reasonable fees, yearly alumni meets, EDC implementation, maintaining the mentor & mentee relationship with student and faculty for improving the morale for every student.

Keywords: Six Sigma, Education Management, Quality control, Business Management, Innovation Technology.

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Introduction

The six sigma method is a project-driven management approach to improve the organization's products, services, and processes by continually reducing defects in the organization. It is a business strategy that focuses on improving customer requirements understanding, business systems, productivity, and financial performance. Dating back to the mid-1980s, applications of the six sigma methods allowed many organizations to sustain their competitive advantage by integrating their knowledge of the process with statistics, engineering, and project management. In the business world, **six sigma** is defined as a 'business strategy used to improve business profitability, to improve the effectiveness and efficiency of all operations to meet or exceed customer's needs and expectations. The six sigma approach was first applied in manufacturing operations and rapidly expanded to different functional areas such as marketing, engineering, purchasing, servicing, and administrative support, once organizations realized the benefits. Particularly, the widespread applications of six sigma were possible due to the fact that organizations were able to articulate the benefits of six sigma presented in financial returns by linking process improvement with cost savings. Six sigma is a systematic, data-driven approach using the *Define, Measure, Analysis, Improve, and Control* (DMAIC) process and utilizing design for six sigma method (DFSS). The fundamental principle of six sigma is to take an organization to an improved level of sigma capability through the rigorous application of statistical tools and techniques. It generally applies to problems common to production summarizes six sigma business strategies, tools, techniques, and principles.

Six Sigma in Business Management (Education Domain)

Six Sigma in education is a Quality Philosophy. It's a philosophy that talks about attainable short-term goals while striving for long term objective. Six Sigma in Education is an art of learning through a study of orientation to the customers' the ultimate parents and the children studying at a college in particular. It is a the pride and enhancement of the products to get recognition out of the Quality Environment of Learning and Study Culture which replicates and laminates the success at large among the masses. The inception of Six Sigma technique in Education is implemented as a novice inception using the quality learning tools, brainstorming

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and benchmarking over all. The work on implementation of the SIX SIGMA IN ACADEMICS would not only spread the cause but shall also give a new dimension to the standard of education in particular.

Review of Literature

According to **Harry and Schroeder (1999)**, Six Sigma is a powerful breakthrough business improvement strategy that enables companies to use simple and powerful statistical methods for achieving and sustaining operational excellence. It is a business strategy that allows companies to drastically improve their performance by designing and monitoring everyday business activities in ways that minimize waste and resources while increasing customer satisfaction.

Park (2002) described that Six Sigma implies three things: Statistical measurement, management strategy and quality culture. It is a measure of how well a process is performing through statistical measurement of quality level.

Although the literature (**Werkema, 2002**) pointed out that the first successful six sigma experience started in 1997, where the Brasmotor Group registered (in 1999) a US\$ 10 million saving, one respondent introduced the programme in its operation in Brazil in 1995 and three respondents in 1996.

The goal of Six Sigma is to design processes that do what they are supposed to do with very high reliability, ultimately producing very consistent products and services (**Coronado and Antony, 2002**).

The numerical goal of Six Sigma is reducing defects less than 3.4 parts per million (PPM) also known as 'Defects Per Million Opportunities' (DPMO), reducing cycle time and reducing costs dramatically, which impact the bottom line (**Behara, et al., 1995; Goh and Xie, 2004**).

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Objectives of the Study

- To study the effects of implementing six sigma in Education Management to ensure and to provide quality education for the students.
- To develop the service standards of Education Management through induction of six sigma Technology.
- To know the perception of students, faculty and management about six sigma and its implications in institutions.

Methodology

The nature of sampling used for the study is convenient sampling for selection of homogeneous sample for the study. It refers to selecting samples of study objects on convince located. Research findings based on convenient sampling however, cannot be generalized. The period of study was limited to 4 months including data collection, data analysis and report preparation. Questionnaires are prepared and personal survey was conducted. Most of the questions consist of multiple choices and the secondary data was collected from Internets, various books, Journals, and college data. The researcher has used the simple percentage analysis to investigate and interpret the processed data. Statistical Package for Social Sciences (SPSS) was used for analytical purpose of the study.

Quality in Education Management

Quality is the culture of demand and education as an industry today has mushroomed from over the years to a mega segment for profit making and learning to earn for more. The essence of Quality demands commitment and as one of our Quality Gurus, Jadish Gandhi, the Founder of the Worlds' Biggest School, CMS, Lucknow, INDIA and the awardees' of the UNESCO Peace Prize, says, the mantra has to be Catch Them Young and Innocent. There is a time now to encapsulate the art and cult of this routine otherwise job of the academicians. We need to evaluate our system of educational and of course the education process to produce best of Quality and Quantity being faced by two customers the Parents and the Students'.

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The ultimate talking of Six Sigma, the phenomenon of Zero Defect to negligence of the theory of 3.14 per million, sounds farfetched. It is good to agree and comment of the fact that the very business of education today is just that—a business. It focuses more today on the bottom line and it is important to stay on the competitive edge for all of its customers from the students and their parents to the faculty, staff, and donors, as well.

At the same time it needs to consider of the view that the act of education also has a greater accountability today. This means that installing quality improvement across the board is more important today than ever before. It is important from both the business and academic sides. A quality improvement program can improve all areas of education.

Analysis and Interpretation

Table 1: Table showing the service standards in the academic

Services	Management	Faculty	Students
Barrier environment	100	100	85.6
Canteen	100	100	96
Electric supply	100	100	95
First aid	100	100	78.3
Institution website	100	92	80
Laboratory & Library	100	100	87.5
Notice board	100	88	100
Potable water supply	100	100	84.5
Safety provision	100	100	85.5
Separate hostel facilities	100	92	96
Sewage disposal system	100	100	84.4
Transportation	80	80	60.8
Vehicle parking	100	100	90
Placement Assistance	100	88	70

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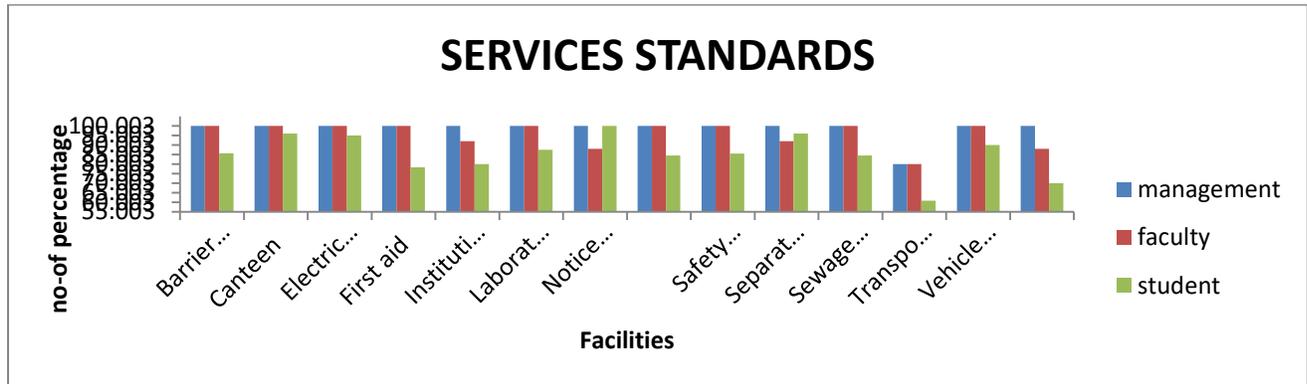
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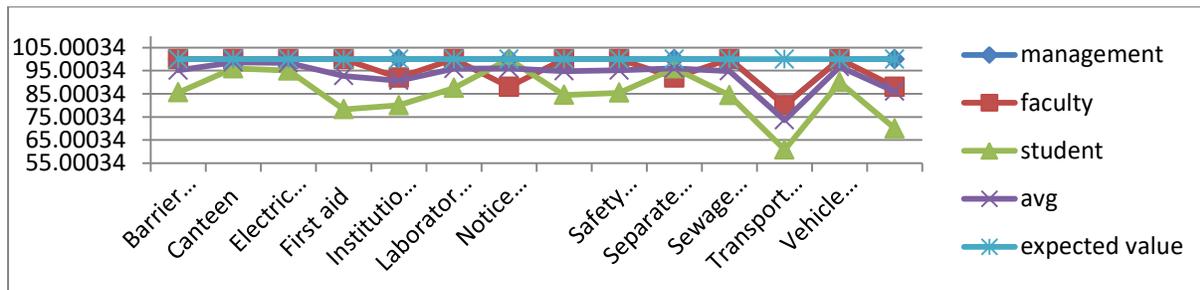
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Chart-1.1: Chart showing the Service Standards in the Academic



Graph-1: Graph showing the Service Standards difference in the Academic



Inference

From the above graph it is clear that 95.00007 % of institutions have implemented canteen and electric supply.,95.00034 % were implemented barrier free environment, library, notice board, water facility, safety provision, separate hostel facility, sewage disposal system.89.00034 % were implemented first aid also 88.003 % have their own website.,86.00034 % were providing placement assistance in their institutions and 75.003 % institutions transportation facility available. Our expected level of six sigma is 99.99966 %. We have concentrate on and below average as 80.00034%.

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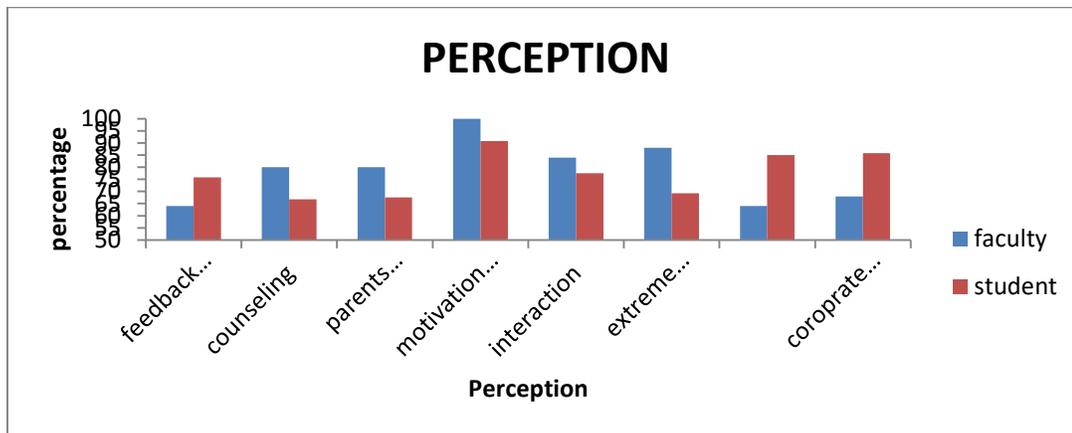
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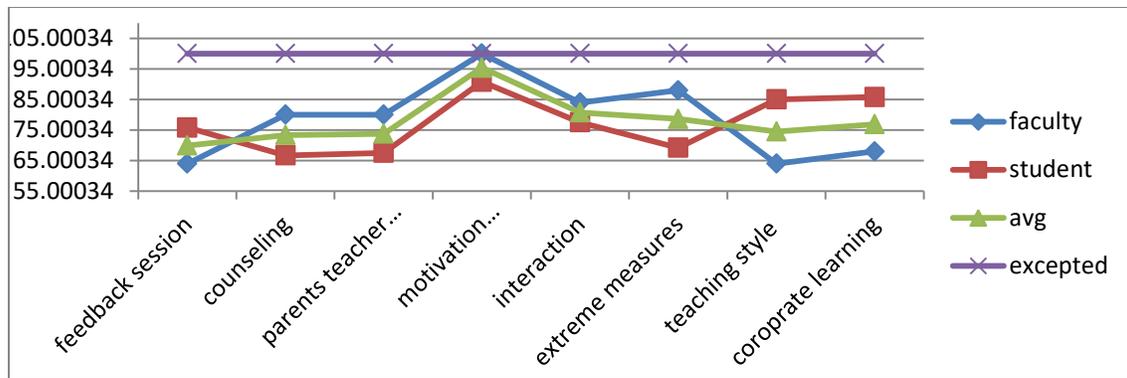
Table-2: Table showing Perception of Faculty and Student

ACTIVITIES	FACULTY	STUDENT
Feedback session	64	75.8
Counseling	80	66.7
Parent teachers meet	80	67.5
Motivation guidance	100	90.8
Interaction	84	77.5
Extreme measures	88	69.2
Teaching style	64	85
Corporate learning	68	85.8

Chart-2.1: Chart showing the Service Standards in the Academia



Graph-2.3: Perception between Faculty and Student with Six Sigma Expected Value



Inference

From the above graph it is clear that 95.00034 % of institutions has motivational guidance.,80.00034 % were having interaction between faculty and student., 79.00034 % were conducting extreme measures for non-performing students.,76.00034 % were allowing their students for corporate learning.,75.00034 % were implemented modern teaching aids.,74.00034 % were conducting counselling and parents-teachers meeting for the welfare of their students.70.00034 % institutions were preferring for the feedback session accordingly. . Our expected level of six sigma is 99.99966 %. So, we have concentrate on and below average of 80.00034%.

Conclusion

“The Six Sigma philosophy that has produced such good results for industrial concerns can be modified slightly and applied to academia. As in industry, here also the emphasis must be on the customer’s needs. The students need has to be defined as the most important. (Joan Burtner, 2004)”.

In this research, Researcher have studied the positive impact of implementing six sigma as a tool in Education Management and how its influencing in quality Education Management regarding its management, faculties and students. Hereby researcher can conclude that implementing six sigma in Education Management will take Education management into steps to the lead. It is also done by the means of benchmarking, brainstorming sessions along with the

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management and faculty should insist the importance of six sigma by the terms of quality circle to the students. Thus, Six Sigma is the continuous quality improvement process.

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A Waste Management of Library Resources

V. Jesintha Banu

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Abstract

Digital Libraries have become inevitable part of the contemporary information society for storage and access of huge amount of information Digital Library inherent advantages like high volume of storage of multiform information, effective search and retrieval, accessible through multiple points at any time, instantaneous downloading faster addition of information etc. With increases of information resources CD/DVD made available in rural/remote areas of developing countries their cost and maintenance is much lesser than the paper books. Print Media transmit information via Physical objects, such as books, magazines, Newspaper and booklets, since it covers a lot of space, prefer e-books to printed items. This Paper discusses sustainable waste management and environmentally, economically, and socially responsible management of information media life-cycles in the library. It is the apt time to dispose all damaged materials to have an easy and quick way of communication. The disposed materials have a great advantage in present society by recycling it. It saves energy, water, landfill space and cost saving resource for making new paper products.

Key Words: Re-cycle, Dispose, Waste Management

Introduction

Many libraries recognize deselection as an important management tool for collection sustainability under current resource strains. How libraries then handle deselected material is an important component of the sustainable library. Many library organizations and systems consider the environment and sustainable resource management as core social responsibilities. Library and information workers are clearly concerned about the impacts of

their activities, as indicated by the writings of many in the profession, discussion about information media and the environment focuses mainly on computer, digital libraries, or paper consumption, and has not yet examined collection disposal in detail. This is problematic given: the environmental impact of new and old media disposal, the economic impact of resources and services needed for disposal methods, and social impacts related to increased environmental awareness and perceptions of responsibility.

The library profession is striving to cultivate and promote sustainability, seen as a key to its survival in a 21st century environment such a focus also reflects the changing attitudes and values of society at large(Calgary public library, n.d.; Jankowska , 2008; Moore, 2005).

Collection sustainability, as often used, is understood to relate to aspects of preservation. It is no longer possible to include everything in one collection and it is increasingly clear that infinite preservation is not possible either. Libraries, and even museums, are finding it necessary to deselect in order to continue to serve their users, operate in an economically sustainable manner, and support the sustainability of the library as a whole (Johnson, 2001;Jordan,2003; Merriman,2008;Slote,1997)

As disposal necessarily follows deselection, a practice already becoming associated with collection sustainability, this is an appropriate area to test new definition. In addition, it is closely tied to other concerns emerging in the library; the environmental impact of information media disposal (Hischer & Reichart, 2003; Levinson, 1998;Zazzau,2006)

Research of collection disposal experiences was undertaken and is explored here. Further investigation, by way of viewing collection disposal as part of a greater life-cycle is also discussed. Multi-criteria decision-making tools (MCDM) are addressed as methods to inform sustainable collection management practices in light of these various sustainability issues associated with collection disposal.

Weeding (Library)

Weeding is the systematic removal of resources from a library base on selected criteria. It is the opposite of selection material, through the selection and de selection of material often involve the same thought process. Weeding is a vital process for an active collection because it ensures the collection stays current, relevant, and in good condition. Weeding should be done on a continuous, on going basis.

Reason to Weed

A “well maintained, well-pruned collection is far more useful than one filled with out of date or unused materials.” Weeding a physical collection has many benefits:

- Space is preserved to add relevant materials.
- Patrons are able to access useful material quickly, and the librarian can direct them to information more easily.
- The collection is more reputable because it is current.
- The librarian can easily see the strengths and weaknesses of the collection.
- Materials are of good quality and physical condition

With many collections having a digital component, space is not an issue for concern. However this does not mean digital collection should not be weeded.” Clearing out unused materials makes a patron’s searching experience better by reducing the number of old and irrelevant records the patrons must wade through in their search results to find what they really want”. Weeding withdrawing books from the library’s collection is one those dreaded librarian tasks. It usually sits on the back burner-other projects are often more pressing, or it’s simply being avoided. However, it’s an important task.

Weeding Criteria

Weeding should be addressed in a Library’s Collection Development Policy, and the criteria should be outlined. The following list outlines some considerations for weeding resources.

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- Poor content
 - * Content is outdated or obsolete
 - * Content is biased, racist, or sexist
 - * Content is irrelevant to patron needs
- Poor Condition
 - * Resource has irreparable damage(torn pages, broken spines)
 - * Resource is dirty or smelly
 - * Resource would not survive further circulation
- Poor Circulation
 - * Resource is not being used by patrons in a certain timeframe
- Other Considerations
 - * Multiple copies that are not needed.
 - * Enough other resources on a particular subject
 - * Should the item be replaced and the cost of replacement
 - * Visual appeal of item(including artwork)
 - * To align the collection with the university's goals, mission and curriculum.
 - * Limited space for the collection

Libraries are not Warehouses

For most academic libraries, our mission is not to collect the whole of human knowledge. We have limited space, limited resources. We are not a warehouse for books- a warehouse is a storage facility. Books are for using-not for sitting on a shelf for years on end.

Seek Input, But Use Your Expertise

Communication is key. Consult with professors in the weeding process. Outline the reasons for weeding and why the project is important for the library. Offer professors the chance to review books slated for withdrawal, but remember that the librarian should use his/her skills and tools to make a final decision.

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The Space Race

Most academic libraries aren't seeing a brand new library building-or even a remodel-anytime soon. Space is at a premium. We investigate how students spend time in the library and use its resources. How to do students use the facility? What do they not do that they would like to do? Stacks and stacks of bound periodicals generally do not make sense anymore in the off-chance a student might browse the section.

Curriculum Counts

Particularly with smaller academic library collection, the mission is to support the courses taught at the university not necessarily a professor's own research interests. As the curriculum evolves, some programs are phased out and new programs implemented. The library collection will change based on the curriculum. It is a "growing organism" (Ranganathan's 5th law of library science)

Bad Circulation

We strive for a high-quality high use collection. Librarians look at circulation statistics(usually both check outs and in house browses) as just one criterion for deciding which books to withdraw-but it's an important one.

Print vs Electronic

In some cases, print copies may be replaced with electronic copies. Will print books be going away anytime soon? No .Opinions on Print vs electronic will vary by discipline. Seek input from faculty and students. However, electronic versions may hold an advantage for certain items: Think of digitized historical primary sources accessible to anyone from anywhere that's better scenario than one book checked out to one person.

The Mini Library Problem

Often when books are discarded, professors want them for their collections. Policies will vary from library to library on this. I've worked at libraries that struggled against historical

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practices that lead to unofficial” mini libraries” on campus. Library staff worked hard to amalgamate library collection for the campus to provide centrally located services and easy to access.

Environmental Protection Agency

Even in this age of electronics we use a lot of paper in the united states about 70 million tons of paper and paperboard each year, according to the US Environmental protection Agency(EPA) Paper and paper products are recycled to a greater extent than any other waste product in the US, representing a 66 percent recycling rate.

Advantages of Recycling Paper

- SAVES ENERGY AND WATER
- SAVES SPACE IN LANDFILLS
- REDUCES GREENHOUSE GASES
- PRESERVING RESOURCES
- IMPROVE CREATIVE SKILLS

Saves Energy and Water

Making recycled paper pulp, compared to generating pulp from trees and other plants to make new paper products, consumes less energy and water. Recycling one ton of paper saves energy equivalent to the energy needed to power the average US home for six months and saves about 7,000 gallons of water. Making recycled paper into new paper products saves energy and water because the number of energy-intensive steps and processes that use water are reduced.

Saves Space in Landfills

Paper makes up about 28 percent of solid trash in landfills and one ton of paper takes up about 3.3 cubic yards of landfill space, according to the EPA. Recycling paper and cardboard saves space in landfills for trash that cannot be recycled and saving space in landfills reduces the

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need to build more landfills. Many communities oppose the building of new landfills in their neighborhoods.

Reduces Greenhouse Gases

Recycling paper reduces methane and carbon dioxide in the atmosphere. When paper decomposes anaerobically in landfill, it produces the gas methane. Methane, a highly potent greenhouse gas, together with carbon dioxide contributes to global climate change. Trees absorb carbon dioxide and when they are cut down to make paper products, more carbon dioxide is released than absorbed. Processing wood to make paper pulp using fossil fuel based energy releases additional carbon dioxide. According to the EPA , recycling one ton of paper can reduce greenhouse gas levels by one metric ton of carbon equivalent.

Preserving Resources

Recycling paper preserves trees and forests. Every ton of recycled paper saves about 17 trees. Recycled paper serves as an environmentally friendly resource for paper manufacturers, saving costs and energy. However paper can only be recycled five to seven times before the paper fibers become too short. Material consisting of short fibers can be composted, burned for energy or used as landfill.

Improve Creative Skill

Recycling paper magazines give out a room for exhibiting the inherent ideas of a person. Here skill is employed. It is used for decoration, collage work , art and craft. However, it can be recycled in many ways.

Conclusion

Waste is a crisis of our own doing. It is becoming more and more difficult to just run faster, catch up and solve the problem. There are just too many of us, producing too much waste. Long term viable solutions require action at every level, personal, corporate and government.

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Dr. C. Swarnalatha, Ph.D. (Ed.) Entrepreneurship and Management:

Innovative Construction Techniques and Ecological Development. *Vol. 1 Management*

V. Jesintha Banu

A Waste Management of Library Resources

A Study about Advance Waste Management

J. Naveen Kumar, PG Scholar

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Abstract

Municipal solid waste management has become a huge topic in many developing countries, especially the ones with huge populations, like China. MSW can be a gigantic trouble causer for the environment, ecological system and societies without proper management; meanwhile, it can also be a resource pool with tremendous potentials for source retrieving, energy recovering, if treated properly. This paper discuss generally about the current MSW status quo, political frameworks and management situations in China with focus on waste separations, both at-source and on-site separation. By introducing the advanced waste management schemes in industrialized countries like Germany and Japan, to determine what is the problems and recommendations for the waste management and separations in China.

Keywords: Municipal Solid Waste, Waste Management, Waste Separation, At-source Separation, On-site Separation.

Introduction

The trend of making the manually controlled things automatic has become a common practice these days. The process of making the things automatic is being exploited in almost all the major fields of life. Making things automatic reduces burden on the humans. The cost and effort used in manually controlled products is much higher than the automated systems. Considering the fact, that the problem of efficient waste management is one of the major problems of the modern times, there is an utmost need to address this problem.

The proper waste management system is must for the hygienic society in general and for world as a whole. Solid waste which is one of the sources and causes of environmental pollution has been defined under Resource Conservation and Recovery Act as any solid, semi-solid liquid or contained gaseous materials discarded from industrial, commercial, mining or agricultural operations and from community activities. Solid waste also includes garbage, construction debris, commercial refuse, and sludge from water or waste treatment plants or air pollution, control facilities and other discarded materials. In order to protect human health and the environment from the potential hazards of delayed waste disposal and environmental pollution a systematically supervised and controlled handling of these wastes is must.

The type of wastes which constitute environmental pollution and which this work emphasizes on is domestic refuse consisting of degradable food wastes, leaves, dead animals and non-degradable ones such as plastics, bottles, nylon, medical and hospital wastes, generated in households, hospitals, industries and commercial centers. The complexity of issues involved in municipal solid waste management necessitates development and application of new tools capable of processing data inputs of varying formats, numerical models and expert opinions in multi objective decision making scenario. Decision Support Systems (DSS) are among the most promising approaches to confront such situations. The DSS models should ideally be integrated with geographical information system (GIS) to optimize collection, transportation, processing and disposal processes.

An attempt is made here to present an overview of DSS in the area of solid waste management with specific reference to their development and applications in India. Waste management is a continually growing problem at global and local levels. Solid wastes arise from human and animal activities that are normally discarded as useless or unwanted. In other words, solid wastes may be defined as the organic and inorganic waste materials produced by various activities of the society and which have lost their value to the first user. The domestic waste products are collected through waste bin at a common place at a particular spot for an area/street. A major difficult task is that checking process of waste bins for the collection of wastes.

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The usual method by which, a person has to wander through the different spots and check the places for waste collection. This is somewhat complex and time consuming process. The present day waste management system is not as efficient as it should have been taking into consideration the advancements in the technologies that arose in the recent years. There is no surety about the management/ clearing of wastes at all the places. To overcome this problem a new approach, Automatic waste management system is proposed. It is a step forward towards making the waste collection process automatic and efficient in nature. Whenever the waste bin gets filled this is acknowledged by placing a RF transmitter at the waste bin, which transmits it to the receiver at the desired place in the area or spot. The received signal indicates the waste bin status at the monitoring and controlling system.

Automatic Waste Management System

We designed a method for managing the wastes in an efficient way in order to reduce the improper utilization of valuable resources like human effort, time and cost. In our approach, we divided the overall system of waste detection into four subsystems viz Smart Trash System, Smart Vehicle System, Local Base Station and Smart Monitoring and controlling Hut. All these sub-systems work intelligently and in coordination to automate the waste management in the Smart Trash Bin(s) so as to dispose-off the waste as and when required without keeping a continuous eye on the waste bins manually.

Recycling

Only 2% of the solid waste is recycled at a recycling facility. Recycling is practiced informally, but the recycling base of Ghana is in general weak. Households in low income areas do not dispose of plastics, bottles, paper, cardboards and cans readily. Recyclable materials are used and reused for domestic purposes and only thrown away when they are no longer of any use to the owners. In high income areas, domestic servants will sell these materials to middlemen to supplement income instead of disposing them along with the other refuse.

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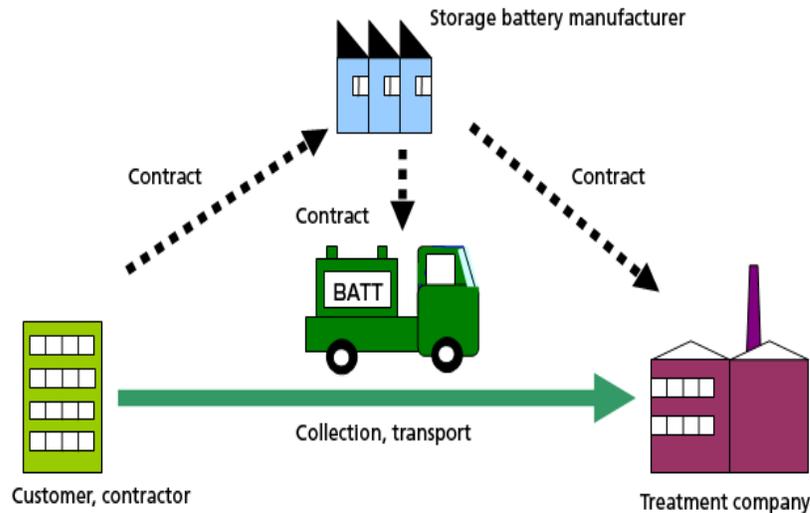
There are two main recycling plants in operation in Accra. Although more waste is generated than can be collected, both recycling plants have been operating under efficiency for years because the waste materials are not separated at the source. Unlike other poor cities around the world, Accra lacks a substantial sector of waste pickers to collect and sort household waste on behalf of merchants, recycling firms, and composting units.²⁹ Encouragement of the waste picker labor market and other participants in the informal recycling sector could help extend the lifespan of the cities landfills through waste diversion.

Incineration

Incineration is a method of burning waste that is combustible at high temperatures in the range of 1000 degrees Celsius to reduce the waste to ashes.³⁹ It is used primarily as disposal for biological waste associated with medical care. Policies governing the appropriate use of incineration exist in Ghana, but Accra incinerators mostly consist of ovens or open pits used to burn bandages and blood products.⁴⁰ After burning, the ash is usually moved straight to an adjacent landfill, where it takes up only a tenth of the volume of the original waste. Ghana's national policy recommends small scale incineration plants, but primarily as a disposal option for health care wastes.

Waste Processing

Involves the treatment and/or conditioning of waste, where treatment and conditioning are defined as follows] treatment operations intended to benefit safety and/or economy by changing the characteristics of the waste. Three basic treatment objectives are volume reduction, removal of radionuclides from the waste, and change of composition of the waste.



Conditioning

Operations that produce a waste package suitable for handling, transport, storage and/or disposal are important. Conditioning may include the conversion of the waste to a solid waste form, enclosure of the waste in containers and, if necessary, providing an over pack. The previous issues of this Status and Trends report gave an overview of radioactive waste processing and highlighted topics such as the minimization of waste arising from nuclear facility decommissioning and innovative approaches to waste processing. In the current issue, an example of a waste processing facility is presented. For upcoming issues, additional

Status Quo of Municipal Solid Waste Generation in China

China has become the world's 2nd biggest economic power since the year 2010, replacing Japan, after the United States. The fast economic development in China has led to an average annual 8% of growth rate of GDP; however, many "by-products" have also tremendously affected China's environmental and ecological conditions, with municipal solid waste (MSW) being one of them.

Smart Trash System

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Smart Trash System embodies an electronic device known as Smart Trash Bin, which consists of Sensors and a Radio Frequency (RF) transmitter. The sensors sense the waste status being collected by the Smart Trash Bin. Two types of sensors are used in the Smart Trash Bin. The first one is a Load sensor which is used to sense the load of the waste in the smart trash bin and the second one is an IR proximity sensor whose function is to detect the level of the waste in the smart trash bin. There are two IR sensors, one placed at the middle of the Smart Trash Bin and the second is placed near the top of the Smart Trash Bin.

The use of two IR proximity sensors makes the decisions more reliable and exact. As shown in the diagram below, the RF signal is transmitted only when all the sensors are in a high state. Whenever the Smart Trash Bin is filled up to the specified load and level, the sensors get activated and it generates a signal that is transmitted by the RF transmitter fitted in the Smart Trash Bin. The signal transmitted by the RF transmitter is received by the RF receiver which is present at the local base station. After receiving the signal, the local base station decodes the trash bin location and accordingly sends a signal to the smart monitoring and controlling hut which sends signal to Smart vehicular system about the location of the trash bin. The monitoring and controlling hut in addition to the site of bin also sends the dumping site to the smart vehicular system.

Smart Monitoring and controlling Hut Interface The interface at the smart Monitoring and controlling Hut has been developed using VB.Net which is an object-oriented programming language that can be viewed as an evolution of the classic Visual Basic (VB), and is implemented on the .NET Framework. The software is to be installed on the Computer System in Smart Monitoring and controlling Hut, which receives the information from the local base stations through internet. The Smart Trash Bin through RF transmitter sends signal to LBSs which then forwards it to SMCH via internet.

At the SMCH, the details about the filled trash bin(s) are displayed on the interface like the location of the trash bin, unique trash bin code, etc. Accordingly, the AWMS software

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obtains further information of the trash bin which has sent the signal like the city, locality, area to which this trash bin belongs and then makes a decision about the vehicle to be selected to dispose of the waste. The smart monitoring cum controlling hut smartly selects the vehicle keeping in view the distance, cost and others factors and these factors reduce the implementation cost of the overall system. After the assigned job has been accomplished successfully by the smart vehicle, an acknowledgement is sent to SMCH. This makes the overall system efficient and reliable. The interface provides an initial Login page to authenticate the user. After valid authentication, the user is directed to the Control Panel page which displays the status of the Smart Trash Bin(s). Whenever the Smart Trash Bin gets filled an alarm signal is produced and the details of the filled Smart Trash Bin are displayed on the interface. The total number of Smart Trash Bins and their details like City, Ward, Locality, Street, whether filled or unfilled is also displayed on the interface. The interface consists of the Login Form, Data Control and Control Panel pages.

Login Window

Only authorized users (employees and administration of city Municipality) can access the system. The restricted access is to employ the security in the Smart Monitoring and controlling Hut.

Data Control

The Data Control has a database connected to it where the information of the Smart Trash Bin(s) is stored. It is also used to maintain the information about the Smart Trash Bin(s) installed in the various locations of the city. This includes the insertion, deletion and updating of information. The information is then accessed by the Control Panel to verify the availability of the Smart Trash Bin. This module has been authorized only to the administrator of the system.

Control Panel

The Control Panel module works on receiving the information via internet and then performs logical operations through programming methodology to display the status of the Smart

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Trash Bin(s) and also produces an alarming signal, if the Smart Trash Bin(s) is filled. The screen shots of the three components of the Interfacing module

Operation since the AWMS consists of four sub-systems and the main system on which the others work is the Smart Trash System which has the functional unit called as Smart Trash Bin. It consists of sensors, encoder and the RF transmitter. Sensors are used to detect the load as well as the level of the waste in the Smart Trash Bin. Whenever the Smart Trash Bin gets filled, the sensors get activated and generate a high signal which is encoded by the encoder. This encoded signal is transmitted by the RF transmitter mounted on top of the Smart Trash Bin. This transmitted signal is received by the RF receiver tag which is placed in the local base station.

The RF receiver in local base station receives the signal and then the decoded signal is sent to monitoring cum controlling hut over the internet with the help of a pocket PC. At this monitoring cum controlling hut site, the information and status of the Smart Trash Bin is displayed. The details like Trash Bin ID, location, etc., of the filled Smart Trash Bin are displayed on the Smart Monitoring and controlling Hut Interface.

The Smart Monitoring and controlling Hut then sends the information signal to the Smart Vehicle System. Once the job detail is received by the vehicle, it moves to the spot and disposes off the waste from that Trash bin that has send “Trash Bin full” status to the Monitoring and controlling hut. On the task completion a task done signal is send by the vehicle to the monitoring and controlling hut.

Conclusion

The Automatic waste management system is a step forward to make the manual collection and detection of wastes automated in nature. The developed system integrated by using four sub systems the Smart Trash System (STS), Local Base Station (LBS), the smart Vehicle System (SVS) and the Smart Monitoring and controlling Hut (SMCH) including RFID

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and internet, in which it would pioneer work for solid waste collection, monitoring and management processes.

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Go Green and Save Environment

J. Josephine Alice Mary, M.Phil. Scholar
A. P. Arul Jeevaraj, MBA

Abstract

Going green is good for the environment, the community, and the economy. By using less energy, less water, and fewer material and natural resources, a green building greatly reduces its harmful impact on the natural environment. Energy efficiency and environmental performance can be evaluated using a “systems” approach during the entire use-phase of a building. The core most benefit of going green is cost cutting when we conserve energy and resources, by not wasting water and electricity, we help to reduce the amount of money and in turn it leads to a healthy and a more sustainable world. Also, it reduces pollution, conserve energy, reduce consumption & waste and protects the earth’s ecological balance and conserves resources. As conventional building materials and methods have been linked to a wide range of health issues, until human population make effective use of the infinite, sustainable, and green sources of available energy, we cannot expect any change in future. A positive reinforcement will definitely create green way of life.

Key Words: Green Building, Energy Conservation, Green Environment

Introduction

Going green has become the new buzz word. Maintaining and restoring the natural environment will play a fundamental role in sustaining our collective future. People’s connection with nature can increase their health and well-being. Green buildings are good for the environment, the community, and the economy. By using less energy, less water, and fewer material and natural resources, a green building greatly reduces its harmful impact on the natural

environment. Children who learn in green schools can demonstrate up to 21% better performance on tests, and patients in green hospitals are discharged earlier.

Green Building Guiding Principles

- Environmental considerations and energy efficiency should become a part of building design and purchasing criteria, consistent with such traditional criteria as product safety, price, performance, and availability.
- Energy efficiency and environmental performance should be evaluated using a “systems” approach during the entire use-phase of a building.
- The process for establishing “sustainable” building/product criteria should include consensus-based decision-making, best available science, transparency, and openness to all relevant stakeholders.

Material

Green design is about finding that balance between high-quality construction and low environmental impact. Green building is a goal and a process. Viewing sustainable building as a process is important, because green-building success isn't just a matter of building with green materials. Green building combines both material and processes to maximize efficiency, durability and savings.

IPD Environment Code

The IPD Environment Code was launched in February 2008. The Code is intended as a good practice global standard for measuring the environmental performance of corporate buildings. Its aim is to accurately measure and manage the environmental impacts of corporate buildings and enable property executives to generate high quality, comparable performance information about their buildings anywhere in the world. The Code covers a wide range of building types (from offices to airports) and aims to inform and support the following;

- Creating an environmental strategy
- Inputting to real estate strategy
- Communicating a commitment to environmental improvement

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Go Green and Save Environment

- Creating performance targets
- Environmental improvement plans
- Performance assessment and measurement
- Life cycle assessments
- Acquisition and disposal of buildings
- Supplier management
- Information systems and data population
- Compliance with regulations
- Team and personal objectives

Healthier Life

As everyone seeking for green life we can gain better quality air, a cleaner environment and better health. According to the World Health Organization air pollution is estimated to cause about 2 million premature deaths worldwide every year. Common air pollutants like lead have been found to be associated with behavioral problems, learning deficits and lowered IQ in young children. In addition, the health of our environment also has an impact on the quality of our food and ultimately our health. It would be hard to imagine how we could remain healthy if we are consuming polluted drinking water and food contaminated with chemicals (e.g. fish with heavy metal contamination, vegetables exposed to acid rain, etc.) for long periods. By keeping our air and environment, cleaner, we are actually building a healthier environment for ourselves, our loved ones and our future generations.

A More Sustainable World

One of the most important benefits of going green is a more sustainable world. At the rate that we are consuming the world's resources, polluting the earth and fuelling global warming, and destroying the earth's ecosystem, we would be left with nothing in future. In turn, these developments would make it easier for people to adopt green living practices.

Green Environment for Now and Future

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Go Green and Save Environment

Adverse effect on forest due to over pollution and chemical effects have created the negative force on climate and rainfall. With the effect of global warming not only human beings are affected but also the species. Situation is going worse day by day. If we don't take steps in right time our generation will be highly affected. Similarly, the harmful effect on the atmosphere brought about by chemical emissions in industrialized countries is a very dangerous sign. We need to start adopting green practices in our daily lives, as well as encourage others around us to do the same. As more and more people start living a green life, there will be greater drive for developments in the area of green energies, recycling and other green technologies, as well as a market for eco-friendly products and services. In practice, going green means adopting five basic principles in your daily life:

Reduce Pollution

Going green mean in practice is to reduce pollution, or the release of toxic substances into the environment. In our daily life we release substantial amount of toxic substances into the environment

Conserve Energy

Another aspect of going green mean is to conserve energy. As with the earth's resources, the sources of energy (in the form of oil, coal, natural gas, etc.) on earth are currently finite. - While humans have started exploring other sources of "sustainable energy", such as palm oil, there are inherent environmental problems with the cultivation of some of these energy sources.

Reduce Consumption and Waste

Foremost practice of going green is to reduce consumption and waste. Reusing helps us to reduce our consumption of new materials, as well as help to reduce the waste that we create as an entire population.

Protect the earth Ecological Balance

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Go Green and Save Environment

The earth's ecological balance refers to the equilibrium formed as a result of the harmonious co-existence of living organisms, including plants, animals and man, on this planet. So when seek to protect the earth's ecological balance, we actually seek to achieve a harmonious co-existence with other living creatures on this planet.

Conserve Resources

With the effect of increase in the population and technology advancement consumption of natural resources are merely high now compared to the olden days. More and more trees are cut down to produce more and more paper for the growing number of offices worldwide. More oil, coal and other natural fuels are extracted from the earth to drive our factory machineries, our automobiles and in our homes. And fuel extraction contributes to polluted air, acid rain and global warming. We are in condition to conserve our finite resources to save future generation.

Suggestion

- Government should strongly ban use of plastics, rather reusable plastic bottles can be used
- Insist everyone to Purchase rechargeable batteries and a battery recharger
- Planting Trees at Home
- Constructors should strongly implement Green building codes and standards

Conclusion

Eco-friendly construction can not only help to create a better outdoor environment, it can also help to build a healthier indoor environment. Conventional building materials and methods have been linked to a wide range of health. Until human population make effective use of the infinite, sustainable, and green sources of available energy, we cannot expect change in future. A positive reinforcement will definitely create green way of life.

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Go Green and Save Environment

Disaster Planning and Management in India - A Study

P. Karthikeyan, PG Scholar

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Abstract

Disasters and their management generally get discussed in their aftermath but practically it should result in planning and preparing the strategy to tackle and mitigate disasters in a responsible and effective manner. Disasters, both natural and unnatural, are macro level events or processes, which induce disturbances and turmoil for a prolonged life-threatening environment for a community. This paper deals about Disaster Planning and Management in India.

Key Words: Disaster, Disaster Planning, Disaster Management, Emergency Plan

Introduction

Disaster Defined

A disaster is a serious disruption of the functioning of a community or a society involving widespread human, material, economic or environmental losses and impacts, which exceeds the ability of the affected community or society to cope using its own resources.

Disaster Planning

Systematic procedures that clearly detail what needs to be done, how, when, and by whom before and after the time an anticipated disastrous event occurs. The part dealing with the first and immediate response to the event is called emergency plan.

Disaster Management

Disaster Management can be defined as the organization and management of resources and responsibilities for dealing with all humanitarian aspects of emergencies, in particular preparedness, response and recovery in order to lessen the impact of disasters.

Objectives of the Study

- To study about the Disaster Planning in India
- To study about the Disaster Management in India

Important Disasters in India

Kashmir Floods

- Year: 2014
- Areas affected: Srinagar, Bandipur, Rajouri etc.
- Death toll: 500 plus

Caused by continuous torrential rainfall, the Kashmir region in September 2014 suffered from massive floods, leading to the death of around 500 people. Hundreds of people were trapped in their homes for days, without food and water. According to reports, around 2600 villages were affected in Jammu and Kashmir. In Kashmir itself, 390 villages were completely submerged in water. Many parts of Srinagar were also submerged by the floods. Around 50 bridges were damaged across the state, and the damage of properties was estimated between Rs. 5000 cr and 6000 cr.

Uttarakhand Flash Floods

- Year 2013
- Areas affected: Gobindghat, Kedar Dome, Rudraprayag district, Uttarakhand, Himachal Pradesh, Western Nepal
- Death Toll: 5000 plus

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Disaster Planning and Management in India - A Study

In the year 2013, Uttarakhand suffered from a major catastrophic natural disaster in the form of huge and deadly cloudbursts, causing flash floods in River Ganga. Sudden, heavy rains caused dangerous landslides in Uttarakhand, which killed thousands of people and thousands were reported missing. The death toll was estimated to be 5,700. The flash floods and landslides continued for 4 days from 14 to 17 June, 2013. More than 1,00,000 pilgrims were trapped in the valleys that led to the Kedarnath shrine. Today, Uttarakhand Flash Floods are considered the most disastrous floods in the history of India.

The Indian Ocean Tsunami

- Year: 2004
- Areas affected: Parts of southern India and Andaman Nicobar Islands, Sri Lanka, Indonesia etc.
- Death toll: 2 lakh plus

Following a major earthquake in 2004, there was a huge tsunami in the Indian Ocean, causing immense loss of life and property in India and the neighbouring countries – Sri Lanka and Indonesia. The earthquake had its epicenter in the ocean bed which led to this destructive tsunami. The magnitude was measured between 9.1 and 9.3 and it lasted for almost 10 minutes. According to reports, it was the third largest earthquake in the world ever recorded. The impact was equivalent to the energy of 23,000 Hiroshima-type atomic bombs. More than 2 lakh people were killed.

Gujarat Earthquake

- Year 2001
- Areas affected: Bhuj, Ahmedabad, Gandhinagar, Kutch, Surat, Surendranagar district, Rajkot district, Jamnagar and Jodia
- Death toll: 20,000 plus

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Disaster Planning and Management in India - A Study

Gujarat was affected by a massive earthquake on the morning of 26 January, 2001, the day on which India was celebrating its 51st Republic Day. The earthquake's intensity was in the range of 7.6 to 7.9 on the Richter scale and lasted for 2 minutes. The impact was so great that almost 20,000 people lost their lives. It is estimated that around 167,000 were injured and nearly 400,000 were left homeless in this natural disaster.

Odisha Super Cyclone

- Year 1999
- Areas affected: The coastal districts of Bhadrak, Kendrapara, Balasore, Jagatsinghpur, Puri, Ganjam etc.
- Death toll: 10,000 plus

This is one of the deadliest storms that affected the state of Odhisa in 1999. Also known as the Paradip cyclone or super cyclone 05B, this cyclone caused deaths of more than 10,000 people in the state. More than 275,000 houses were destroyed. Around 1.67 million people were left homeless. When the cyclone reached its peak intensity of 912 mb, it became the strongest tropical cyclone of the North Indian basin.

Latur Earthquake

- Year: 1993
- Areas affected: Districts of Latur and Osmanabad
- Death toll: 20,000 plus

This was one of the deadliest earthquakes, which hit Latur in Maharashtra. The year was 1993. Almost 20,000 people died and around 30,000 were injured. The earthquake's intensity was measured 6.4 on the Richter scale. There was huge loss to property. Thousands of buildings were turned into rubble and more than 50 villages were destroyed.

The Great Famine

- Year: 1876-1878

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P. Karthikeyan, PG Scholar

Disaster Planning and Management in India - A Study

- Areas affected: Madras, Mysore, Hyderabad, and Bombay
- Death toll: 3 crore

Southern and southwestern parts of the country were affected by a major famine in 1876-78, which killed nearly 3 crore people. The famine, which first started in China, spread over to India and affected millions of people in the period between 1876 and 1878. Even today, it is considered as one of the worst natural calamities in India of all time.

Coringa Cyclone

- Year: 1839
- Areas affected: Coringa district
- Death toll: 3.2 lakh people

India was affected by the Coringa Cyclone, in the harbour city of Coringa in Andhra Pradesh. It killed almost 3.2 lakh people. More than 25000 vessels were ruined by this huge cyclone. One of the worst natural disasters in the history of India, the cyclone struck the tiny city Coringa in Godavari district in Andhra Pradesh. It destroyed the entire city. It was indeed one of the biggest disasters that shook India.

Calcutta Cyclone

- Year: 1737
- Areas affected: Low-lying areas of Calcutta
- Death toll: 3 lakh plus

The Hooghly River Cyclone was one of the most-dangerous natural disasters of India, which affected Calcutta in 1737. Many people were killed. A large number of ships, almost 20,000, docked on the harbour were damaged. Also referred as the Calcutta Cyclone, the low-lying areas in the Calcutta region were badly affected. This cyclone killed 300,000 to 350,000 people of the region and hence considered to be as the worst calamity that time.

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The Bengal Famine

- Year 1770, 1943
- Areas affected: Bengal, Odhisa, Bihar
- Death toll: 1 crore

A massive famine affected the pre-independence state of Bengal and some parts of Odisha and Bihar. The year was 1770 and extended for almost 3 years till 1773. One of the greatest natural disasters to have hit India ever, the famine led to the deaths of 1 crore people due to hunger, thirst and disease, reducing the population to 30 million in Bengal.

The Bengal province of pre-partition British India was affected by another famine in 1943 in which around 4 million people died due to starvation, malnutrition and disease. More than half of the population of the region died from diseases as an after effect of the famine.

Disaster Planning in India- Scope and the Nature

To the extent possible, disaster planning should incorporate formal disaster research findings. Disaster plans sometimes rely on faulty assumptions that do not prove true in actual disasters. For example, planners may logically assume that the sickest patients are transported first during a disaster, when in reality, this may not happen in many instances.

Other realities that have been noted in prior events are that the initial search and rescue begins with victims and bystanders and not trained rescue teams, the majority of patients arrive to hospitals without use of the EMS system and have not been triaged or decontaminated, and there is often lack of communication between healthcare facilities and the scene. These characteristics are likely to occur in future disasters and should be incorporated into realistic disaster plans.

A disaster plan encompassing both local and regional areas must focus on the following 3 possible scenarios:

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1. The disaster occurs within the region and is confined and controlled with area resources.
2. The disaster occurs in a neighboring region and regional assets are requested through mutual aid agreements.
3. The disaster area is the region and requires state or federal assistance for an effective response.

In developing a disaster plan, leaders should remember that it is impossible to plan for all contingencies; therefore, plans must be relatively general and expandable. Most disasters that can be contained using local or regional resources have fewer than 100 fatalities and fewer than 500 casualties. Plans developed for larger-scale disasters should focus on the first 48 hours of the disaster until state and federal assistance teams can arrive and the need to address high initial fatality rates during the first 24 hours. Mutual aid agreements or contracts with other existing area resources also are important to establish before an actual incident, as well as planning for funding and reimbursement.

Disaster Management in India

Humans have managed disasters and an overview of our past experiences shows that management of disasters is not a new concept. For example, in ancient India, droughts were effectively managed through conventional water conservation methods, which are still in use in certain parts of the country - like Rajasthan. Local communities have devised indigenous safety mechanisms and drought-oriented farming methods in many parts of the country.

The subject of disaster management is not mentioned in any of the three lists in the Seventh Schedule of the Indian constitution, where subjects under the Central and State governments are specified. In the post-independent India, a journey through the five-year plans points to the fact that the understanding of disasters was to mitigate droughts and floods; schemes such as the Drought Prone Area Program (DPAP), Desert Development Program (DDP), National Watershed Development Project for Rain fed Areas (NWDPR) and Integrated

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Water Development Project (IWDP) are examples of this conventional paradigm (Planning Commission, 2002).

Recent Changes

The late 1990s and the early part of this century marked a watershed in Disaster Management in India. The Orissa Super Cyclone and the Gujarat Earthquake taught the nation a hard lesson. The experiences of the stakeholders like the state, voluntary sector and the communities at large helped in initiating the planning process pertaining to preparedness and mitigation of disasters.

A welcome step in this direction was setting up of a High Powered Committee on Disaster Management in 1999, which submitted its report in 2001. An important recommendation of the committee was that at least 10 percent of plan funds at the national, state and district levels be earmarked and apportioned for schemes that specifically address areas such as prevention, reduction, preparedness and mitigation of disasters. Also for the first time in the planning history of India, planners devoted a separate chapter titled ‘Disaster Management: The development perspective’ in the tenth five-year plan document (Planning Commission, 2002).

More recently, several institutions with a focused mandate on disaster management have come up in various parts of the country. The Ministry of Home Affairs (Disaster Management Division), National Institute for Disaster Management (New Delhi), Gujarat State Disaster Management Authority (GSDMA), Orissa State Disaster Management Authority (OSDMA), Disaster Mitigation Institute (Ahmedabad) can be seen as initiatives taken in the right direction.

There has also been a concerted effort on the part of the state to mainstream Disaster Mitigation initiatives in Rural Development schemes. One of its example is the coordination between the Ministry of Rural Development and the Ministry of Home Affairs, which is now the nodal ministry for coordination of relief and response and overall natural disaster management, for changing the guidelines of schemes such as Indira Awas Yojna (IAY) and Sampoorn

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Grameen Rojgar Yojna (SGRY) so that the houses constructed under IAY or school buildings/community buildings constructed under SGRY are earthquake/cyclone/flood resistant.

Role of NGOs

Since the community is the first responder in any disaster situation, there is a great need for community level initiatives in managing disasters. The initiatives taken by various agencies, including the state, need to be people-centric and the level of community participation should be gauged through the role played by the community in the process of planning and decision-making. Efforts should also be made to strengthen local economies, thereby making people independent of external assistance (Gupta, www.gisdevelopment.net).

The voluntary sector has been in the forefront of mobilizing communities, enabling them to cope with disasters in the past decades. Their initiatives and experiences have been consolidated and demonstrated on a larger scale with the help of the state. Development organizations working in communities share a good rapport with the community, which helps the state in implementing its plans more effectively; village level plans prepared after the Super Cyclone in Orissa could be seen as an example of the same.

The focus of any disaster management plan now incorporates the following:

- Community Based Disaster Preparedness
- Development of block, Gram Panchayat and Village disaster management plans

This has been made possible through continuous advocacy by development organizations like Action Aid, Oxfam, CARE- India, etc. These initiatives have been scaled up by the state, which has taken efforts to integrate disaster management plans with the larger developmental plans at all levels such as Village/Panchayat/Block/District/State.

Government has got the whole machinery in place and the relief work is carried out with the help of the following agencies- Indian Red Cross Society ,Indian Institute of Tropical

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Meteorology, UNDP India, Tata Energy Research Institute, Housing and Urban Development Corporation Ltd., Ministry of Urban Development and Council for Advancement of People's Action and Rural Technology (CAPART). All these agencies in the past responded to major disasters in the country. For example, in the state of Orissa in the aftermath of Super Cyclone in 1999, they provided immediate relief services to the affected families. Further, they collected and distributed relief material, helped in providing immediate shelter, supported voluntary organizations for implementing activities pertaining to the relief and rehabilitation work and provided training to masons for repairing damaged houses. The vast network of partner voluntary organizations provides the Government with a greater opportunity to implement Disaster Management plans at the grassroots level much more effectively.

Challenges for the Future

There is a growing need to look at disasters from a development perspective. Disasters can have devastating effect on communities and can significantly set back development efforts to a great extent. But then, it could also offer an opportunity to invest in development efforts in a post disaster scenario. Disasters are opportunities for communities to reinvent themselves.

Disaster prevention, mitigation, preparedness and relief are four elements, which contribute to and gain from the implementation of sustainable development policies. These elements, along with environmental protection and sustainable development, are closely inter-related. The Yokohama Strategy, emanating from the international decade for natural disaster reduction in May 1994, emphasizes that disaster prevention, mitigation and preparedness are better than disaster-response in achieving the goals and objectives of vulnerability reduction.

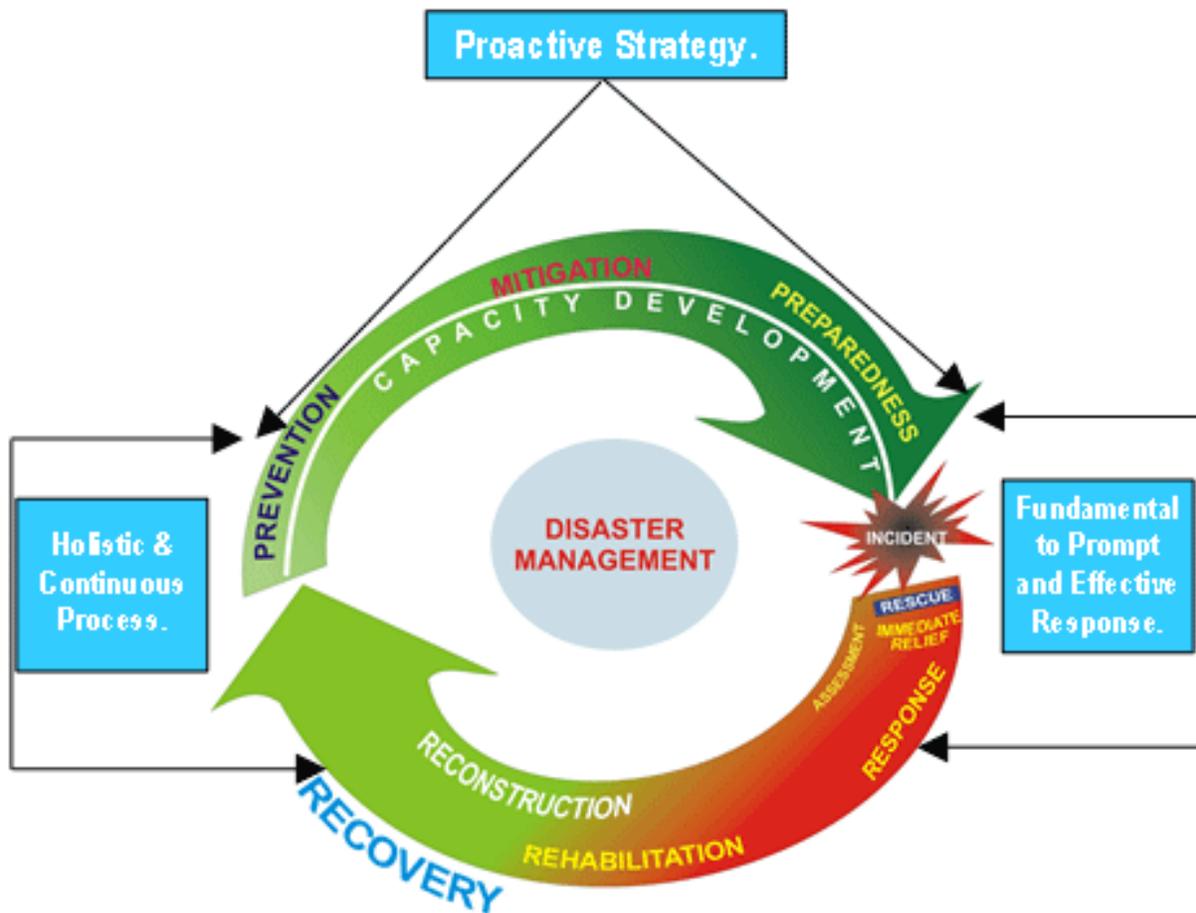
The Government of India has adopted mitigation and prevention as essential components of its development strategy. The Tenth Five Year Plan emphasizes the fact that development cannot be sustainable without mitigation being built into the development process. In brief, Disaster Management is being institutionalized into development planning. But, there are various

underlying problems in the whole process. In fact, a number of problems stem from social inequities.

In the long run, the onus is upon the local communities to handle disasters with the help of the state and other such organizations. It is a well-known fact that the community dynamics is quite complex in a country like India. There is a need to address specific local needs of vulnerable communities through local traditions and cultures. Restoration of common property resources with the participation of the local level bodies is a real challenge. The historical focus of disaster management has been on relief and rehabilitation after the event but now the focus is on planning for disaster preparedness and mitigation. Given the high frequency with which one or other part of the country suffers due to disasters, mitigating the impact of disasters must be an integral component of our development planning.

One of the glaring lacunae in the process of Disaster Management in India has been the overlooking of unnatural disasters. The recent efforts focus purely on natural disasters, whereas the current global situation also demands initiatives in managing the impact of unnatural disasters. Developments at the international level, particularly the civil wars and civil strife in Eastern Europe and Southern America culminating on 9/11 have brought the issue of unnatural disasters at the forefront of disaster management. The global community has recognized the serious consequences of Nuclear, Biological and Chemical (NBC) warfare. This remains a serious challenge for India to address in the near future.

DISASTER MANAGEMENT CONTINUUM



Conclusion

The need of the hour is to chalk out a multi-pronged strategy for total disaster management comprising prevention, preparedness, response and recovery on the one hand and initiate development efforts aimed towards risk reduction and mitigation on the other. The countries in the Asia-Pacific region should establish a regional co-ordination mechanism for space-technology based disaster mitigation and strengthen co-operation, Luan suggested, adding that they also need to set up an all-weather and all-time comprehensive space-based disaster mitigation system and share the information.

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Entrepreneurship Opportunities and Challenges in India

M. Lakshmanan, Teaching Fellow

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Abstract

This paper examines Entrepreneurship opportunities and challenges in India. The paper sees entrepreneurship as the process of creating something new with value by devoting a necessary time and effort, with the accompanying financial and the social risks, and receiving in return monetary rewards and independence and personal satisfaction. The paper show that there is increasing interest on Entrepreneurship by business people, consumers and government officials which is manifested in increasing research on the subject and the realization that it quickens the process of employment creation, industrialization and poverty reduction.

Keyword: Entrepreneurship, Opportunities, Entrepreneurs.

Introduction

The economic development of a Nation depends on its industrial development. The industrial development is based on the entrepreneurial competencies of the people. Hence, the concept of building entrepreneurship Promotion is need of the hour. The term “entrepreneurship” comes from the French verb “entreprendre” and the German word “unternehmen”, both means to “undertake”. Bygrave and Hofer in 1891 defined the entrepreneurial process as involving all the functions, activities, and actions associated with perceiving of opportunities and creation of organizations to pursue them“. In simple, entrepreneurship is the act of being an entrepreneur, which can be defined as "one who undertakes innovations, finance and business acumen in an effort to transform innovations into economic goods".

In the 21st century, Micro, Small and Medium Enterprises (MSMEs) are acting as specialist and soul of economic growth in India as well as in the world. Micro, Small and Medium Enterprises (MSMEs) play a dominant role in the economic development of a country. MSMEs have been largely recognized as a foundation stone for the industrial development of any country. These enterprises contribute about 90 per cent of the business worldwide. They provide employment to more than 50 per cent of the world's workforce. A tremendous growth of small scale sector has resulted in decentralized industrial development, better distribution of wealth, investment and entrepreneurial talent. This sector produces a mixture of industrial products such as food products, beverages, tobacco and goods produced from it, cotton textiles and wool, silk, synthetic products, jute and jute products, wood and wood products, furniture and fixtures, paper and goods produced from it. Other services also comprise of machinery, apparatus, appliances and electrical machinery.

Qualities of a Successful Entrepreneur

Being an entrepreneur is not just starting a business, it is about having attitude and the drive to succeed in business. All successful Entrepreneurs have a similar way of thinking and possess several key personal qualities that make them so successful in business.

Not being afraid of Delegating Tasks. As entrepreneurs, we tend to always have a full plate and feel that we can take on any task. In reality, if we keep adding to the already-full plate it is eventually going to collapse and create a mess. Don't be afraid to delegate tasks to an experienced member of your company that has the ability to get tasks completed.

Managing Time Effectively. Proper time management is necessary to distinguish between extremely urgent tasks and those that can wait. Use a notebook or whiteboard to prioritize your tasks by writing them down. Mobile devices and tablets have calendars and notepads, but nothing is more effective than actually writing down your "to-do" list.

Visualizing Goals and Success. You need to see your goals and success in your mind first if you plan on making them a reality. Not only do you need to visualize the end result, but you also need to visualize every step that it is going to take to get there.

Listening and Communicating Well. If you aren't a good listener and communicator it will result in miscommunications and wasted time, not to mention added work to correct the miscommunications. Time is one thing that all entrepreneurs would like more of. How often have you wished there was more hours in a day? Avoid wasting priceless time repeating and redoing tasks due to poor communication.

Understanding your Time is valuable. While it would be great to be able to give everyone the time that they wanted, it would leave you with little to no time to accomplish the things that you need to get done. If a sales representative has a question, they should address it with the sales manager. Your time is valuable, so don't waste it on disruptions that should be handled by other members of your organization.

Seeking help when you need it. We often let our stubbornness prevent us from asking for help. Have you ever been stumped and someone comes along with the answer and you think, "Why in the world didn't I think of that?" Often times a clear mind and different viewpoint can quickly solve a problem or provide an answer to a question. Don't be afraid to ask for help when you need it, as it can also help to strengthen the communication within your organization.

Getting out of the office. As an entrepreneur, you have probably spent several 18-hour days behind your computer or worked through the night late at your office until the sun came back up. It is important to break your day up, for both your physical and mental health. Take a few breaks throughout the day and walk around the office or take a walk outside to clear your head and give your eyes a break from the computer. Leave your office for lunch, even if you bring it -- go eat outside and get some fresh air.

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Giving Back. It is important to understand how lucky we are, as entrepreneurs, to do what we love. When you are appreciative of what you have accomplished and then take a step back to see what you can do to give back, it gives you a feeling like no other.

Opportunities in India

There is certainly no formula to become a successful entrepreneur. Some may succeed and make good profits, others sink along the way. Which are the most lucrative sectors for entrepreneurs? Here's a list of good opportunities entrepreneurs can look at...

Tourism

Tourism is a booming industry in India. With the number of domestic and international tourists rising every year, this is one hot sector entrepreneurs must focus on. India with its diverse culture and rich heritage has a lot to offer to foreign tourists. Beaches, hill stations, heritage sites, wildlife and rural life, India has everything tourists are looking for.

Automobile

India is now a hot spot for automobiles and auto-components. A cost-effective hub for auto components sourcing for global auto makers, the automotive sector is potential sector for entrepreneurs. The automobile industry recorded a 26 per cent growth in domestic sales in 2009-10.

Textiles

India is famous for its textiles. Each state has its unique style in terms of apparels. India can grow as a preferred location for manufacturing textiles taking into account the huge demand for garments. Places like Tirupur and Ludhiana are now export hubs for textiles. A better understanding of the markets and customers' needs can boost growth in this sector.

Software

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India's software and services exports are likely to rise with export revenue growth projected at 13 to 15 percent to hit about \$57 billion by March 2011. With one of the largest pool of software engineers, Indian entrepreneurs can set higher targets in hardware and software development.

The information technology enabled services have contributed substantially to the economy. With more companies outsourcing contracts to India, business to business solutions and services would be required. Entrepreneurs can cash in on the rise in demand for these services with innovative and cost effective solutions.

Engineering Goods

India continues to be one of the fastest growing exporters of engineering goods, growing at a rate of 30.1 per cent. The government has set a target of \$110 billion by 2014 for total engineering exports. Entrepreneurs must capitalise on the booming demand for products from the engineering industry.

Franchising

India is well connected with the world. Hence, franchising with leading brands who wants to spread across the country could also offer ample opportunities for young entrepreneurs. With many small towns developing at a fast pace in India, the franchising model is bound to succeed.

Education and Training

There is a good demand for education and online tutorial services. With good facilities at competitive rates, India can attract more students from abroad. Unique teaching methods, educational portals and tools can be used effectively to make the sector useful and interesting.

Food Processing

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India's mainstay is agriculture. Entrepreneurs can explore many options in the food grain cultivation and marketing segments. Inefficient management, lack of infrastructure, proper storage facilities leads to huge losses of food grains and fresh produce in India.

Ayurveda and Traditional Medicine

India is well known for its herbal and ayurvedic products. With increasing awareness about the ill-effects allopathic medicines, there will be a huge demand for cosmetics, natural medicines and remedies.

Organic Farming

Organic farming has been in India since a long time. The importance of organic farming will grow at a fast pace, especially with many foreigners preferring only organic products. Entrepreneurs can focus on business opportunities in this sector. There are many small-time farmers who have adopted organic farming but the demand is still unmet, offering many opportunities for those who can promote organic farming on a large scale.

Media

The media industry has huge opportunities to offer young entrepreneurs. With the huge growth of this segment, any business in this field will help entrepreneurs reap huge benefits. Television, advertising, print and digital media have seen a boom in business.

Packaging

With China invading the markets with cheap plastic goods and packaging materials, there is a good opportunity to develop good packaging materials to meet domestic and foreign demand. There is a huge demand various sectors like agriculture, automotive, consumer goods, healthcare infrastructure and packaging sectors for plastics.

Floriculture

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India's floriculture segment is small and unorganized. There is a lot to be done in this lucrative sector. The global trade in floriculture products is worth \$9.4 billion. With a 8 per cent growth, it is expected to grow to \$16 billion by 2010. India's share in world trade is just 0.18 per cent.

Healthcare Sector

India's healthcare sector is dismal. The private sector can play a vital role in developing this sector. With medical tourism also gaining momentum, the sector can attract foreigners who are looking for cost effective treatment in countries like India.

Biotechnology

After the software sector, biotechnology opens a huge potential. Entrepreneurs can look at a plethora of options with the application of biotechnology in agriculture, horticulture, sericulture, poultry, dairy and production of fruits and vegetables.

Energy Solutions

In a power starved nation, the need to develop cost effective and power saving devices is gaining more significance. There is a huge demand for low-cost sustainable energy saving devices as well. The government has already unveiled the National Solar Mission which has set a target of 20,000 MW of solar generating capacity by the end of the 13th Five Year Plan.

Recycling Business

E-waste will rise to alarming proportions in the developing world within a decade, with computer waste in India alone to grow by 500 per cent from 2007 levels by 2020, according to a UN study. This sector opens a viable business opportunity for entrepreneurs in terms of e-waste management and disposal.

Entrepreneurship Challenges in India

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Courage to start your own business: Starting your own venture is not an easy task. You need a lot of courage and strength to quit your job and start your own business. One needs to be determined and confident towards his/her goals. You need to convince yourself that there is a need of such product in the market and you are the best person to build it.

Is your idea big enough? Idea is the most important challenge which every entrepreneur faces. What are you planning to go for? What type of business you are going to deal in? Who are your target audiences? Is your Idea really worth giving a chance? These are few questions that would come up in your mind and you need to find answers for them. “A lot of the times one can go into a thinking phase before starting up because there are so many questions one needs to answer. One can get stuck in the midst of the question marks and never take any action,” explains Arora. Before ideating, always remember that if your business doesn’t provide solutions to the consumers or doesn’t give something that they want; then you are going to fail as an entrepreneur for sure.

Family Challenges: Convincing to opt for business over job is easy is not an easy task for an individual. The first thing compared is – Will you make more money in business of your choice or as a successor of family business. This is where it becomes almost impossible to convince that you can generate more cash with your passion than doing what your Dad is doing. **Social Challenges:** Family challenges are always at the top because that is what matter the most but at times social challenges also are very important. Let us say you and your friend graduated at the same time. You opted for entrepreneurship and your friend opted for a job. He now has a flat, car and what not because he could easily get those with a bank loan but you still have nothing to show off and this is where challenge comes.

Raising Capital: Money is another biggest challenge faced by an entrepreneur. Now you have to decide when, how and from whom you are going to raise the required capital. At times, people need to bootstrap their start-up for a longer period of time.

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Hiring Right Talent: After you have decided to start your own venture, you need a team. Behind every successful business is a dream team - be it finding a right co-founder or the founding start-up team. Getting someone, who believes in your idea/venture as much as you, to make it work is always difficult, but yet the most crucial.

Effective Marketing on Limited Budget: Being a start-up it's very essential to create visibility among your consumers. You need to reach your target audiences by using effective marketing techniques.

Financial Security: For a start-up to be a successful enterprise one needs to answer two most important questions – ‘Do I have enough savings to ensure my family’s financial security?’ and ‘Does the company have enough funds to ensure at least a year’s runway?’ If you know you have enough savings for the family, then you can easily focus on the start-up that you are building. Along with it, if your start-up has enough working capital, then you have the ability to take bigger risks.

Policy Challenges: Now and then there is lot of changes in the policies with change in the government: Problems of TRIPS and TRIMS, Problems of raising equity capital, Problems of availing raw-materials, Problems of obsolescence of indigenous technology, Increased pollution, Ecological imbalance, Exploitation of small and poor countries, etc.

Dealing with Stress: It is correctly said ‘No pain no gain’. Entrepreneur has to go through many stresses – whether it is related to its business or family. To run a successful business one needs to be very strong and clam. So if you are starting up your own venture, then be prepared to deal with the daily stress.

Facing Failure: It's not necessary that every idea of yours will work. With launching of new products and scaling new markets comes the notion of “failing fast”. If you're trying a lot of new things, not everything will work and you will not succeed at each of those ideas.

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“The biggest challenge that I see most entrepreneurs face is the fear of failure. The education system in India rewards success and penalises failure. One then grows up with these fears built over time, which become a hindrance to take risks required to start-up. It is extremely important to have a non-shattering belief in your vision, and work towards your goals with perseverance. **Is this a quote? Where does it end? Whose quote is this? Please include citation.**

Conclusion

Entrepreneurship is essential for rapid and sustained economic growth and development. It creates the required Man power and skills necessary for accelerated growth, reduce unemployment and poverty. It is therefore strategic and wise for India to assign a significant and increasing role to entrepreneurship in their effort to revamp the economy. For the entrepreneurs to be effective in creating wealth and employment opportunities, the government needs to create an investor-friendly environment encompassing stable macro-economic policies. Most entrepreneurs simply got tired of working for others, had a great idea they wanted to commercialize, or woke up one day with an urgent desire to build wealth before they retired. So they took the big leap.” The country’s economic policy environment must be favourable for organizations to achieve efficiencies in today’s global market. It should enable the entrepreneurs to provide a magical touch to an organization, whether in public or private or joint sector, in achieving speed, flexibility, innovativeness, and a strong sense of self-determination. They bring a new vision to the forefront of economic growth of a country. The study of entrepreneurship has relevance today, not only because it helps entrepreneurs better fulfill their personal needs but because of the economic contribution of the new ventures.

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A Study about the Business Management in Innovation Technology

Lavanya P.K., PG Scholar

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Abstract

The organized and coordination of the activities of a business in order to achieve defined objectives management is often included as a factor of production along with materials, and money. According to Peter Drucker the basic task of management includes both marketing and innovation. Practice of modern management originates from the 16th century study of low efficiency and failures of certain enterprises, conducted by the English statesman Sir Thomas More (1478-1535). Management consists of the interlocking functions of creating corporate policy and organizing, planning, controlling, and directing an organization's resources in order to achieve the objectives of that policy.

Keywords: Coordination, Planning, Controlling, Directing

Introduction

Although technology trends seem to come and go with frightening regularity, some have a lasting impact on business. These are ones that change the way businesses operate and provide dramatic improvement for those that adopt them. Such technologies help organizations become operationally lean, agile and responsive, increase effectiveness and improve outcomes. Innovative technology also empowers executives, managers and workforces to operate their businesses more effectively. The Business Technology Innovation benchmark research explores in detail how companies can make technology deployments and use these choices to gain a competitive advantage and streamline operations. The research identified and quantified the ways in which organizations use each of six technology innovations across business and IT. It

also explores the value of using these technologies to create more effective processes, and assesses the maturity of organizations' current use and the benefits of deployment.

Scope

Management involves identifying the mission, objective, procedures, rules and manipulation of the human capital of an enterprise to contribute to the success of the enterprise. This implies effective communication: an enterprise environment (as opposed to a physical or mechanical mechanism) implies human motivation and implies some sort of successful progress or system outcome. As such, management is not the manipulation of a mechanism (machine or automated program), not the herding of animals, and can occur either in a legal or in an illegal enterprise or environment. Management does not need to be seen from enterprise point of view alone, because management is an essential function to improve one's life and relationships. Management is therefore everywhere and it has a wider range of application. Based on this, management must have humans, communication, and a positive enterprise endeavor. Plans, measurements, motivational psychological tools, goals, and economic measures (profit, etc.) may or may not be necessary components for there to be management. At first, one views management functionally, such as measuring quantity, adjusting plans, meeting goals. This applies even in situations where planning does not take place. From this perspective, Henri Fayol (1841–1925) considers management to consist of six functions:

1. Forecasting
2. Planning
3. Organizing
4. Commanding
5. Coordinating
6. Controlling

Basics

Management operates through five basic functions: planning, organizing, coordinating, commanding, and controlling.

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- **Planning:** Deciding what needs to happen in the future and generating plans for action(deciding in advance).
- **Organizing:** Making sure the human and nonhuman resources are put into place
- **Coordinating** (or staffing): Creating a structure through which an organization's goals can be accomplished.
- **Commanding** (or leading): Determining what must be done in a situation and getting people to do it.
- **Controlling:** Checking progress against plans.

Basic Role

- **Interpersonal:** roles that involve coordination and interaction with employees
- **Informational:** roles that involve handling, sharing, and analyzing information
- **Decision:** roles that require decision-making

Skills

Management skills include:

- **Political:** used to build a power base and to establish connections
- **Conceptual:** used to analyze complex situations
- **Interpersonal:** used to communicate, motivate, mentor and delegate
- **Diagnostic:** ability to visualize appropriate responses to a situation
- **Leadership:** ability to lead and to provide guidance to a specific group
- **Technical:** expertise in one's particular functional area.

Implementation of Policies and Strategies

- All policies and strategies must be discussed with all managerial personnel and staff.
- Managers must understand where and how they can implement their policies and strategies.
- A plan of action must be devised for each department.
- Policies and strategies must be reviewed regularly.

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- Contingency plans must be devised in case the environment changes.
- Top-level managers should carry out regular progress assessments.
- The business requires team spirit and a good environment.
- The missions, objectives, strengths and weaknesses of each department must be analyzed to determine their roles in achieving the business's mission.
- The forecasting method develops a reliable picture of the business's future environment.
- A planning unit must be created to ensure that all plans are consistent and that policies and strategies are aimed at achieving the same mission and objectives.

Business Models and Technological Innovation

Business models are fundamentally linked with technological innovation, yet the business model construct is essentially separable from technology. We define the business model as a system that solves the problem of identifying who is the customer(s), engaging with their needs, delivering satisfaction, and monetizing the value. The framework depicts the business model system as a model containing cause and effect relationships, and it provides a basis for classification. We formulate the business model relationship with technology in a two-way manner. First, business models mediate the link between technology and firm performance. Secondly, developing the right technology is a matter of a business model decision regarding openness and user engagement. We suggest research questions both for technology management and innovation, as well as strategy.

Refining the Innovation Performance Link

Strategy scholars have underplayed the role of business model choice in their search for establishing a link between technology innovation and competitive advantage. The typical assumption that a radically improved product or service offering will over time automatically lead to increased profits for the innovating firm(s), ignores the enormous problems that firms face in working out the interdependencies between business model choice and technology effectiveness.

A given technology seldom operates in isolation from other technologies; interoperability is required in order to create the intended value. This is a well-recognized relationship, but it recently has become more intense, dynamic and uncertain, due to the arrival of sophisticated information technology and greater availability of platform technologies. Those who assume a simple relationship between technology development and the performance outcomes for a firm or firms ignore the moderating influence of business model choice. Business model choice determines the nature of complementarity between business models and technology and the paths to monetization. A poor choice can lead to low profits, a good choice to superior profits.

Can Technology Improve Business Innovation?

Useful innovation is one of the most meaningful outputs of human creativity. Today, technological aids are increasingly employed to improve and amplify the innovation process. Now new social methods, especially crowdsourcing, have fundamentally altered how innovation is achieved and even who does it

Building an Open Innovation Capability

We can summarize the landscape of new digital tools and techniques for *open innovation* into four specific buckets. These are *platforms*, *communities*, *methods*, and *supporting functions*:

- **Platforms for Open Innovation.** New networked technologies, particularly ones based on social media, have greatly increased the richness and reach of innovation programs. While open innovation is possible without these tools, they can considerably reduce cost while increasing scale and scope. Leading examples include Spigit, Idea Scale, Bright Idea, Open IDEO, and Brain Bank, but there are many others.
- **Open Innovation Communities.** Beyond technology platforms, there are pre-existing for-profit and non-profit innovation communities for many disciplines and industries that can be tapped into to drive innovation programs. Well known examples include Innocentive, Idea Connection, and Nine Sigma, to name just a few.

- **Open Innovation Methods.** There are two main axes here: Business function and collaborative method. The business function might be product development, software development, business development, marketing, sales, fund raising, and so on. That's because each business function has a unique set of innovation concerns that often requires either special supporting platforms and/or particular communities that must be cultivated or tapped into. The second is the specific collaborative method to create the targeted innovation. This is often one of two major forks in the road in terms of creating the result: a) Either a single winning result from many individual contributions or b) one individual joint work product from many incremental contributions.
- **Supporting Functions.** Although IT can help lead the business when it comes to open innovation, it must make sure the platforms, communities, and methods are supported by a robust set of business functions to protect the organization while enabling rapid co-creation. These include the smart and lightweight application of shared idea ownership (the best open innovation programs often ensure everyone who contributed can benefit), the security of the enterprise information that often must be shared for open innovation to be successful, and finally application and community selection and management.

Advantages & Disadvantages of Innovative Technology



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Market Expansion

Innovative technology can help even smaller businesses compete on a global stage. Innovations such as the Internet, for example, allow a sole proprietor to offer her products or services to prospects around the world through the use of a website. She can provide detailed product descriptions and photos of her products to provide prospects with all the information they need to make an informed buying decision. Social media vehicles like Facebook and Twitter also allow her to network with others who may have an interest in her business, without the need for face-to-face interaction.

Cutting Costs

Innovation can also help business owners keep costs to a minimum. With the use of automation, a small manufacturer can reduce his dependence on human beings to perform some of the necessary production processes. As a result, the business can reduce employee expenses such as salary, benefits and turnover. Technology can also help to streamline the production process, eliminating costly waste. Implementing a "lean" manufacturing process like Six Sigma, for instance, offers the opportunity to meet customer demand more quickly and efficiently.

Employee Concerns

While innovative technology may reduce the dependence on a workforce, the flip side is that employees lose jobs in the process. In the case of a small business owner, this may mean she needs to make a difficult choice between increasing profits or letting go long-time employees. Even if the implementation does not result in job loss, some employees may have difficulty adapting to the change. There may also be a learning curve when instituting the change, resulting in reduced productivity in the short term.

Upfront Costs

While new technology can result in savings in the long run, it sometimes results in a significant upfront expense. A small business owner may not have the resources to purchase a

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state-of-the art computer system or new machinery, or may need to borrow the money to do so. If the new purchase doesn't increase production or reduce expenses over the long haul, it could have a crippling effect on the long-term viability of the operation.

Conclusion

Team collaboration is seen to be very important. Leadership role is also very important.

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A Study about the Business Management in Innovation Technology

**Influencing Entrepreneurial Behavior among Engineering College
Students in Madurai District:
An Empirical Study**

**S. Vijay Mallikraj
Prof. Dr. S. Raju**

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Abstract

Entrepreneurship has been found as an important driver of economic growth, productivity and social development; hence the need for entrepreneurial graduate is on the increase. The objective of the present paper is to explore the factors that influence the entrepreneurial behaviors of engineering college students in Madurai district. The study was empirically tested on a sample of 200 students in the city. The result of the survey showed that all the profile factors impacts on students entrepreneurial behavior. The findings of this study have important implications for those who formulate, deliver and evaluate educational policies in Tamilnadu. Based on the findings policy makers may make changes to foster students interest in entrepreneurship.

Keywords: Education, Entrepreneurship Behaviour, Entrepreneurial Intention.

1. Introduction

Entrepreneurship is recognized as an important source of job growth and economic development of a country. The rate of growth for entrepreneurship varies from country to country as well as from time to time for the same country. Entrepreneurship is defined as “the process of creating new venture and new organization (S. Shane and S. Venkataraman, 2000). Kelley et al (2010) opined that entrepreneurship can provide a source of income when an economy cannot supply enough jobs or other alternatives for generating wages or salaries, and

providing positive social value is in place. Further as per, Indarti, et al. (2010) background of non-economic and business education significantly influenced the intentions to be an entrepreneur in the future.

Many researchers have been trying to identify the causes of entrepreneurship intention with plenty of literatures conducted over the past decades. The present research is carried out to identify the factors influencing the entrepreneurial behaviour of engineering college students in Madurai district, with an aim to provide deeper understanding about the entrepreneurship and to practically provide important implications for educational and political reforming as well as to assist policy makers in entrepreneurial training and support new business founders.

2. Literature Review

The entrepreneurial intention of students has been widely studied by many authors (Henderson and Robertson, 2000; Lee et al., 2005; Veciana et al., 2005; Wang and Wong, 2004). Wang and Wong (2004) in a Singapore based study reveals that gender, family business experience, and education level are significant factors in explaining entrepreneurial interest. Shapero (1982) concluded that the entrepreneurial intention arises from the perception of feasibility and desirability of a person and this path is affected by the cultural and social context. Many studies have proved that entrepreneurial education considerably influences students' intention to start their own businesses (Wu & Wu 2008; Fayolle et al. 2006). Pihie (2009) found that the students had moderate score on all constructs related to entrepreneurial intention and entrepreneurial self-efficacy in the aspects of management, financial and marketing. Ahmed et. al. (2010) further highlighted that the respondents are moderately interested to opt for entrepreneurial venture in the future. Dell (2008) in his study mentioned that desirability to be entrepreneur is the measure of individuals' attitude toward entrepreneurship.

3. Objectives of the Study

- 1) To identify the pertinent factors influencing the entrepreneurship behavior of students

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2) To understand whether there is difference in entrepreneurial intention with regard to profile of the respondents

4. Methodology

This is a descriptive study mainly based on primary data. Secondary data necessary for the study is collected from various published sources. Primary data has been collected from 200 students of various engineering colleges in Madurai district with the help of a structured questionnaire.

The questionnaire comprises of two sections. The first part consists of the profile of the students and the second part is related to the various factors influencing the entrepreneurship behavior. Likert scale is used to measure the responses on a five point scale ranging from extremely agree to extremely disagree. Random sampling technique has been used for the study. Relevant statistical tools such as percentage analysis, factor analysis and Anova were used to analyse the data. This study was a descriptive and a cross-sectional survey design. Before completing the questionnaire, the subjects were assured that the information contained in the questionnaire would remain completely confidential.

5. Results and Discussion

Data collected has been analyzed using different statistical tools. SPSS version 20 was used for assessment of the data and for testing the hypothesis. This part discusses the analysis and interpretation of the collected data. The descriptive analysis of the study includes the personal profile and academic profile of the respondents. The data necessary for the study will be critically studied from various dimensions of entrepreneurial behavior.

Profile of the Respondents

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Respondents of the present study were asked about their personal profile, which included gender, family type, and family size, Nature of Admission and Place of Residence. The Responses are presented in form of table in the section that follows at table1.

Table1 - Profile of the Respondents

Profile	Category	Frequency	Percent
Family Type	Nuclear	129	64.5
	Joint	71	35.5
Gender	Male	102	51.0
	Female	98	49.0
Family Size	Upto 3	22	11.0
	More than 3	178	89.0
Nature of Admission	Merit	84	42.0
	Management	116	58.0
Place of Residence	Urban	67	33.5
	Semi Urban	27	13.5
	Rural	106	53.0

Out of the total of 200 respondents 51.0 per cent of the sample size is male and 49.0per cent are female. Also it is inferred that 64.5% of the respondents belong to Nuclear family. Further 89.0 % have more than 3 members in their family and11.0 %respondents have up to 3 members in their family. 53.0 % have their residence rural area, 33.5% respondents have their native place in urban area and 13.5 % in semi urban areas. Further 58.0 % of the respondents joined through management quota.

Identifying key Entrepreneurship Behavioural Factors

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For measuring Entrepreneurship behavioural factors, a questionnaire containing 28 items consisting of a scale ranging from “extremely agree to extremely disagree” were constructed. The number of items loaded under each factor, its reliability (Cronbach alpha) and total variance explained by each factor are explained in Table 2.

Table 2

Factor Analysis and Cronbach alpha values for Entrepreneurship Initiative factors

Factors	Items	Loadings	Reliability	Variance Explained
Self-Reliance	Sr5	.879	0.781	14.451
	Sr2	.856		
	Sr3	.852		
	Sr4	.742		
	Sr1	.667		
Entrepreneurial Intention	Er2	.881	0.721	12.011
	Er3	.871		
	Er4	.862		
	Er1	.794		
	Er5	.643		
Success Orientation	So2	.809	0.881	10.040
	So3	.764		
	So1	.752		
	So4	.642		
Societal Responsiveness	Sr4	.834	0.725	8.422
	Sr1	.821		
	Sr3	.718		
	Sr2	.701		
Self-	Sa1	.937	0.804	7.612

Attentiveness	Sa2	.935		
	Sa3	.418		
Trade Initativeness	Ti1	.733	0.788	7.011
	Ti2	.702		
	Ti3	.622		
	Ti4	.548		
Societal Interaction	Si2	.732	0.822	6.872
	Si1	.694		
	Si3	.460		

Table 1 clearly shows the factor loadings of the respective items under each construct, depicting the structural validity of the scales used, along with the Cronbach values for each extracted factors exceeding .70 indicating the reliability of the scales.

Hypothesis Testing

Comparison of Entrepreneurial Intention across the profile of the respondents

Hypothesis H_0 = There is no significant mean difference among the profile of the respondents with respect to Entrepreneurial Intention To determine how far the mean score of entrepreneurial intention varies between the personal profiles of the sample respondents an f test (ANOVA) was conducted to analyse the significant mean differences. The results are shown in the bellow table.

Table 3

F test between Personal profile of the respondents and Entrepreneurial Intention

Independent Variables	Category	Entrepreneurial Intention		
		Mean	SD	F
Gender	Male	3.35	0.551	10.112*

	Female	2.21	0.236	
Place of Residence	Rural	1.87	0.422	11.241*
	Semi Urban	2.89	0.513	
	Urban	3.29	0.61	
Family type	Joint Family	3.04	0.665	4.812*
	Nuclear Family	3.07	0.762	
Family size	Up to 3	3.52	0.421	12.012*
	4- 5	2.11	0.234	
	6 and above	2.08	0.377	
Nature of Admission	Merit	3.05	0.743	11.115*
	Management	3.07	0.795	

* Significance at 5 per cent level

From table3, significant mean differences between the Gender ($F= 10.112$, $P < 0.05$), place of residence ($F= 11.2241$, $P < 0.05$), Family type ($F= 4.812$, $P < 0.05$), Family size ($F= 12.012$, $P < 0.05$) and Nature of Admission($F= 11.115$, $P < 0.05$) were found with regard to Entrepreneurial Intention. Comparing the respondents mean value of Entrepreneurial Intention among the gender male ($M= 3.35$) respondents have a higher mean score value. The respondents mean value of Entrepreneurial Intention across the place of residence revealed that students from urban area have a higher ($M= 3.29$) mean score. On comparing the mean value of Entrepreneurial Intention among the family type no major difference was found. An elevated Entrepreneurial Intention score was found among respondents with up to 3 family members ($M = 3.52$). On comparing the mean value of Entrepreneurial Intention among the respondents on the basis of nature of admission, respondents belonging to both the categories of institutes have an identical score.

6. Conclusion

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This research observed several significant findings through the descriptive and inferential analyses that were carried out to identify the relationship between personal profile factors, demographic profiles and entrepreneurship intention among engineering graduates. All the profiles have a significant effect on the entrepreneurial intention. The findings indicate that the students who are male and hailing from urban area have a higher entrepreneurial intention. But no major difference was found with regard to nature of admission and family type. The findings will therefore, offer an insight to advance analysis and will provide the understanding of why and how this may be assorted in an intensifying environment viewpoint. However, the findings of this study need to be taken with precaution because of the low percentage respondents and is clearly not representative for the general population. Future perspective of the research posed unanswered questions in terms of what factors help in realization of intentions is warranted. What prerequisite and process suitable to implement the entrepreneurial intention.

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A Study about Business Management and Innovation Technology

N. Manoj Kumar, PG Scholar

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Abstract

Business Management and Innovation technology management is an inevitable issue in the high end technological and innovative organizations. Today, most of the innovations are limited with developed countries like USA, Japan and Europe while developing countries are still behind in the field of innovation and management of technology. But it is also becoming a subject for rapid progress and development in developing countries. Innovation and technology environment in developing countries are by nature, problematic, characterized by poor business models, political instability and governance conditions, low education level and lack of world-class research universities, an underdeveloped and mediocre physical infrastructure, and lack of solid technology based on trained human resources. This paper provides a theoretical and conceptual framework analysis for managing innovation and technology in developing countries like India and China. We present the issues and challenges in innovation and technology management and come up with proposed solutions.

Key Words: Innovation and technology, developing countries, revolutionary, decision.

Introduction

The Business Technology Innovation benchmark research explores in detail how companies can make technology deployments and use these choices to gain a competitive advantage and streamline operations. The research identified and quantified the ways in which organizations use each of six technology innovations across business and IT. It also explores the value of using these technologies to create more effective processes, and assesses the maturity of organizations' current use and the benefits of deployment.

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A Study about Business Management and Innovation Technology

Although technology trends seem to come and go with frightening regularity, some have a lasting impact on business. These are ones that change the way businesses operate and provide dramatic improvement for those that adopt them. Such technologies help organizations become operationally lean, agile and responsive, increase effectiveness and improve outcomes. Innovative technology also empowers executives, managers and workforces to operate their businesses more effectively.

But deciding which technologies to adopt and where to apply them requires thought and planning, and for many it is hard to know where to start and how best to ensure that they are not falling behind in competitive global markets. This confusion is multiplied when six game-changing technology innovations appear virtually simultaneously; each category requires its own approach to evaluation and selection of products, and this says nothing of the complexity of combining them.

Objectives

Understand the nature of strategic competitiveness and develop the ability to analyze the competitive environment facing a firm, assess the attractiveness of the industry and identify potential sources of competitive advantage. Recognize typical technical, organizational, and market issues that occur during the product life cycle, and be better equipped to anticipate and manage such problems. Consider the actions of competitors and how that impacts the ability of a business to accomplish its strategic goals. Develop courses of actions that incorporate the actions of multiple players in the marketplace. Discriminate among the types of data that general managers need to evaluate alternative scenarios. Make quantitative assessments of strategic alternatives and develop logical, coherent and persuasive analyses for a desired course of action

The Role of Management

Due to increased competition and accelerated product development cycles, innovation and the management of technology are becoming crucial to corporate success. Research conducted by Forbes, Ernst & Young, and the Wharton School of Business found the most

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important driver of corporate value for both durable and non-durable companies to be innovation.

Importance of Technology and Innovation

It must be emphasized by people at the very top and reinforced by people throughout a corporation. If top management and the board are not interested in these topics, managers below them tend to echo their lack of interest. When growth in sales and profits stalled at P&G several years ago, the new CEO, Art Lafley, realized that product development was no longer a core competency of the company

Technological Developments

Motorola, a company well known for its ability to invest in profitable new technologies and manufacturing improvements, has a sophisticated scanning system. Its intelligence department monitors the latest technological developments introduced at scientific conferences, in journals, and in trade gossip. This information helps it build “technology roadmaps” that assess where breakthroughs are likely to occur, when they can be incorporated into new products, how much money their development will cost, and which of the developments is being worked on by the competition. A company’s focusing its scanning efforts too closely on its current product line is dangerous.

Most new developments that threaten existing business practices and technologies do not come from existing competitors or even from within traditional industries. A new technology that can substitute for an existing technology at a lower cost and provide higher quality can change the very basis for competition in an industry. Managers therefore need to actively scan the periphery for new product ideas because this is where breakthrough innovations will be found. By the time Microsoft realized the significance of this threat, Netscape had already established itself as the industry standard for browsers. Microsoft was forced to spend huge amounts of time and resources trying to catch up to Netscape’s dominant market share with its own Internet Explorer browser. One way to learn about new technological developments in an

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industry is to locate part of a company's R&D or manufacturing in those locations making a strong impact on product development. Large multinational corporations (MNCs) undertake between 5% and 25% of their R&D outside their home country.



The same is true of the semiconductor industry in terms of manufacturing.²¹ Impact of Stakeholders on Innovation A company should look to its stakeholders, especially its customers, suppliers, and distributors, for sources of product and service improvements. These groups of people have the most to gain from innovative new products or services. Under certain circumstances, they may propose new directions for product development. Some of the methods of gathering information from key stakeholders are using lead users, market research, and new product experimentation. Research by Von Hippel indicates that customers are a key source of innovation in many industries. Suppliers are often important sources as well.

These lead users are “companies, organizations, or individuals that are well ahead of market trends and have needs that go far beyond those of the average user.” They are the first to adopt a product because they benefit significantly from its use—even if it is not fully developed. At Dow Chemical, for example, scientists solicit feedback from customers before developing a

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new product in the lab. Once the product is ready for commercialization, Dow gives its lead users the first opportunity to use the product and suggest further development.

At the time, it was dominated the market but had not developed a new product improvement in almost a decade. After spending six weeks learning about the cause and prevention of infections, the project team spent six more weeks investigating trends in infection control. The team then worked to identify lead users—doctors in developing nations and veterinarians who couldn't afford the current expensive drapes. The team invited several lead users to a 21 /2-day workshop focused on “Can we find a revolutionary, low cost approach to infection control?” The workshop generated concepts for six new product lines and a radical new approach to infection control.

The team chose the three strongest concepts for presentation to senior management. It has successfully applied the lead user method in 8 of its 55 divisions. Lead user teams are typically composed of four to six people from marketing and technical departments, with one person serving as project leader. The four phases of the lead user process are:

- **Lay the Foundation:** Identify target markets and the type and level of innovations desired.
- **Determine the Trends:** Research the field and talk with experts who have a broad view of emerging technologies and leading-edge applications.
- **Identify Lead Users:** Talk with users at the leading edge of the target and related markets to understand their needs.
- **Develop the Breakthrough:** Host a two- to three-day workshop with several lead users and a half-dozen marketing and technical people. Participants first work in small groups and then as a whole to design the final concepts that fit the company's and the users' needs.

Categories of Innovation

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Innovation can range from incremental to radical. As shown in Figure A–2, a corporation’s capabilities (existing or new) interact with its strategic scope (limited or unlimited) to form four basic categories of innovation. A corporation may emphasize one of these categories or operate in all of them.

Quadrant 1: Improving Core Businesses: This type of innovation focuses on incremental innovations that can be developed rapidly and inexpensively. It includes line extensions and more convenient packaging and is often a part of a horizontal growth strategy. Its potential weakness is market myopia—its emphasis on current products and customers. As illustrated earlier in this chapter, Pepsi & co is the master of this type of innovation.

Quadrant 2: Exploiting Strategic Advantages: This type of innovation focuses on taking existing brands and product lines to new customers and markets without requiring major change in current capabilities.

Quadrant 3: Developing New Capabilities: This type of innovation focuses on deepening customer satisfaction and loyalty to the brand or product line by adding new organizational capabilities without introducing major changes in strategic scope. The company may develop or purchase new technologies, talents, or businesses to better serve the firm’s current scope of customers and markets. It may involve a vertical growth strategy. Its potential weakness is the investment cost and implementation time. Microsoft follows an embrace-and-extend policy to either acquire or imitate a new product in order to offer it to its current customers in the next version of Windows or Office software.

Quadrant 4: Creating Revolutionary Change: This type of innovation focuses on radical innovations that transcend current product lines or brands to make fundamental changes in both its strategic scope and its capabilities. This can mean a new business model and a revolutionary new future for the company. Its potential weakness is a high risk of failure. Sony Corporation is

the master of radical innovation. Its pioneering products, such as the Walkman, the Airboard, and the robo-pet Aibo, introduce whole new product categories.

Innovation



Developing an Innovative Entrepreneurial Culture

To create a more innovative corporation, top management must develop an entrepreneurial culture—one that is open to the transfer of new technology into company activities and products and services. The company must be flexible and accepting of change. It should include a willingness to withstand a certain percentage of product failures on the way to success. It should be able to manage small, incremental innovations in existing products as well as radical advances that may alter the basis for competition in an industry.

Largeness is not a disadvantage. In his classic book *Diffusion of Innovations*, Rogers reveals that innovative organizations tend to have the following characteristics: Positive attitude toward change Decentralized decision making Complexity Informal structure Interconnectedness Organizational slack (unused resources) Large size System openness Such a culture has been noted in Corporation and Texas Instruments, among others.

First, employees are dedicated to a particular project outcome rather than to innovation in general.

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Second, employees are often responsible for all functional activities and for all phases of the innovation process. Time is allowed to be sacrificed from regular duties to spend on innovative ideas. If the ideas are feasible, employees are temporarily reassigned to help develop them. These people may become project champions who fight for resources to make the project a success.

Third, these internal ventures are often separated from the rest of the company to provide them with greater independence, freedom from short-term pressures, different rewards, improved visibility, and access to key decision makers.

Conclusion

The management of technology and innovation is crucial in today's fast-moving global environment. In every industry, the leading competitors are the innovators. The list of today's innovators, well-known companies such as Dell, Southwest Airlines, and Starbucks, lead their industry now but will eventually cede this advantage to other companies with even better ideas.

The real challenge for strategic management is sustained innovation. Royal Dutch/Shell had traditionally been better at investing in large, low risk projects yielding a modest return than in small, high-risk projects with the potential to transform the entire industry. In an effort to emphasize radical innovation, the company introduced a new approach called Game Changer. Six teams of six people each meet every week at the Exploration and Production Divisions in Houston, Texas, and in Rijswijk, the Netherlands, to consider ideas that have been sent to them by e-mail. Out of these Game Changer teams have come four business initiatives for the corporation. One of them is Shell's new "Light Touch" oil-discovery method—a way of using lasers to sense hydrocarbon emissions released naturally in the air from underground reserves.

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An Organisational Study about Eco Friendly Structure

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Abstract

The diminishing wood resource and reduction in natural forests, particularly in the tropics, have focused world attention on the need to identify a substitute building material that should be renewable, environment friendly and widely available. In view of its rapid growth, a ready adaptability to most climatic conditions and properties, superior to most new fast growing wood, bamboo emerges as a very suitable alternative. This paper deals with some of the main properties and the major uses of bamboo and its culms. It also recommends on the various preservation techniques to be adopted in order to enhance the durability and various Indian Standard codes (IS codes) for bamboo and bamboo products.

Key Words: Green building, low carbon building, green house effect, Eco-friendly construction.

Introduction

When the need for a new structure arises, an individual or agency has to arrange the funds required for its construction. The individual or agency henceforth referred to as the owner then approaches an architect. The architect plans the layout so as to satisfy the functional requirements and also ensures that the structure is aesthetically pleasing and economically feasible. In this process, the architect often decides the material and type of construction as well. The plan is then given to a structural engineer who is expected to do locate the structural elements so as to cause least interference to the function and aesthetics of the structure. He then makes the strength calculations to ensure safety and serviceability of the structure.

This process is known as structural design. Finally, the structural elements are fabricated and erected by the contractor. If all the people work as a team then a safe, useful, aesthetic and economical structure is conceived. However in practice, many structures fulfill the requirements only partially because of inadequate coordination between the people involved and their lack of knowledge of the capabilities and limitations of their own and that of others. Since a structural engineer is central to this team, it is necessary for him to have adequate knowledge of the architects and contractors work. It is his responsibility to advise both the architect and the contractor about the possibilities of achieving good structures with economy.

Other Eco-Friendly, Energy Efficient Product Choices

While affordable eco-friendly alternative carpets and rugs can be purchased and installed, the most eco-friendly flooring option is usually to avoid their use altogether. Better flooring choices include the aforementioned cork or bamboo, hardwood from Forest Stewardship Council (FSC) certified forests, recycled glass tiles, and natural, hypo-allergenic, biodegradable linoleum. There are other interior product options that qualify as green material, too. Better for house occupant s health and their pocketbooks; enhancing the home s eco-friendly design, positively impacting the environment. Including:

- Lightweight concrete countertops, made from recycled newspaper and fly ash
- Walls finished using non-toxic eco-friendly paint
- Energy efficient lighting such as fluorescent lighting or the use of solar energy (note: in some provinces a solar energy rebate or else solar energy grants might be available)
- Energy smart appliances such as an energy efficient water heater or refrigerator
- Kitchen cabinets and furnishings free of formaldehyde a toxic chemical that causes off-gassing, widely used to manufacture building materials and various household products
- The use of an exhaust fan over the stove, to remove carbon monoxide and other gases
- The use of bathroom fans and ventilation to remove water vapors, reducing the risk of mold and mildew

- The installation of properly filtered ventilation systems to remove dirt, dust, pollen, and other pollutants.

It might also be well worth the expense to hire a building envelope consultant or indoor air quality consultant to assess your home and help find ways to conserve energy and make your home more eco-friendly.

Features of Ecological Building and Some Techniques

In more conventional building construction, it is how technology and building materials merge and create ecological resources that are the key to green success, as well as using simple and readily available materials.

For example, using pulped recycled paper for roof insulation is a simple but highly effective ecological resource. The damage to human health from asbestos insulation, laid out in rolls in thousands of UK homes, is now well known. Asbestos also takes hundreds of years to decompose in landfill.

Other features of an ecological building might include:

- The varied use of solar panels for domestic hot water heating,
- Water conservation, possibly including biological waste water treatment and re-use, and the simple collection and recycling of rainwater for garden use,
- Low energy lightbulbs, which can last up to 100 times longer than regular bulbs,
- Cellulose insulation (like the paper in the above example),
- Non-toxic or lead-free paints and wood preservatives,
- Locally-grown and harvested timber from sustainably managed forests.

The Range of Ecologically Built Structures

Many options are now available to those wishing to design and build an eco-friendly dwelling. Architects, engineers and builders worldwide are now using construction techniques that have been developed throughout human history, in response to local environmental concerns

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and the physical resource opportunities available, coupled with 21st century technological refinements.

These range from rammed earth construction, which involves clay-based material mixed with water and then rammed into brick or solid wall form, suitable in hot and dry climates, to straw bale houses, literally using bales of straw as the core structure. Straw is a great insulator, is a breathable material that filters the air passing through it, and contrary to expectation, is fire-resistant when compressed. And it is low cost.

Other options are so-called earth ships, which use recycled car tyres filled with earth as the buildings walls, or Yurts or Gers, the semi-permanent nomadic tents of Inner Asia, that utilise local wood, wool and canvas, to literally live on, with the land. These examples can be seen as development that has a low impact upon the environment, which utilise and blend in with the local environment, and could be dismantled and moved easily.

Find Examples of Ecological Building

Local Councils and Housing Associations in the UK are now exploring the benefits of ecological construction, and estates constructed on these principles have been built in Edinburgh, in the Cambridgeshire village of March, and several in London.

An interesting project in the capital is BedZED, in the borough of Sutton, which utilises solar heating and heat given off by the occupants, combined with a small power plant using wood off-cuts, to heat and power each house, and achieves zero carbon emissions. The estate was planned to be built with materials that were sourced from within 35 miles. This development consists of 82 housing units, owned and managed by the Peabody Trust. It is a great example of a sustainable development building estate, combined with the principles of social housing.

To provide inspiration to those of us who want to build ecologically, many UK regions have a demonstration eco-house as a feature within a local Centre for Sustainability, such as The Centre for Alternative Technology, near Machynlleth, Wales, the Create Centre in Bristol, and at

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the Findhorn Foundation, near Forres , Scotland. These are all set up as educational centres with ecological and sustainable development at their core, which offer eco-construction courses and advice.

Other European Countries, particularly Germany, are making eco-construction a national priority, as part of a Governmental response to sustainable development. Currently, there is no Internationally-agreed target for reducing carbon emissions, but several Governments and Non-Governmental Organisations (NGO's) are recognising that the built environment plays a huge role in this.

There are now many examples of eco-building around - from simple designs to elaborate constructions. They can be a challenge to conceive and create, but by doing so, we benefit from being in them, and the Environment appreciates it too!

Literature Review

In the 21st century greenhouse gases discharge resulting in climate change (basically carbon dioxide) in the environment (CE Report & EB Report, 2015), is being marked as the biggest challenge (Perez-Lombard et.al. 2008). In the overall greenhouse gas emission the infrastructural sector has been recognized as the most outsized contributor (Per-Anders Enkvist, Thomas Naucner and Jerker Rosander, 2007, IPCC, 2007, Nicholas Stern, 2008). Statistics shows that global energy (UNEP/WHO, 2009) consumption in residences, commercial areas, and other buildings (Horvath, 1999) is above 40%. Electric equipment are being used for conditioning the buildings and so the energy consumption is acute (Harvey, 2009). The prediction projects that as India and neighbor countries are in the moderate level the figure will be double (UNEP Kyoto, 2008). It indicates that within 14 years major ecological threats will come for the over populated nations as well as imbalanced unstructured building.

Living in a life hazardous place is not expected by all. Green building or eco-structure construction has become major topic (Olanrewaju, 2011) for the property industry (Robinson, 2007). Today; unlike traditional buildings “Green” building has gained popularity in

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environmental (Zigenfus, 2008 & Edwards, 2011) and health perspective which consumes major natural sources like energy, water, substances, and surface with more efficiency. Incr efficiency (EPBD, 2002), can have large effects on life-cycle of building. With the demand of developed countries (Matthew E. Kahn, 2009) and sophistication of developing economies (Edward L. Glaeser and Matthew E. Kahn, 2010, Siqi Zheng et al., 2009) the energy efficiency in building will significantly increase with time. Green buildings or sustainable building (EPA,2013) or 'green potential' (Ben Avraham & Capeluto, 2011) involves using sustainable methods (Berardi ,2013) and materials for planning and structuring properties (or in existing properties renovation) and operations, where the aim is to lower operations and maintenance costs including energy efficiency (EPBD,2002) in lighting technologies and air quality, redeveloping brown field sites, or using green roofs that allow for runoff water to be recycled and also contribute to enriched workforce and student fitness, comfort, and productivity. The global environmental discourse and guiding ecosystem protection (Walsh, 2004; EPA, 2008), reduction or elimination of the negative impact of buildings (LEED, 2004) are being dominated by sustainable development. Though the average additional costs of green buildings require an amount, the advantages of those buildings are comparatively ten times higher. (Kats, 2003; Wiley, 2008; Wiley et. al, 2010).

According to Karlenzig, 2005; the procedure of creating buildings and supporting infrastructure is referred to Green buildings that: 1) makes a decrease in resource usage, 2) decreases the negative effects on the environment, and 3) ensures well-conditioned environments for people Cost savings, developed human performance (including productivity and health), and increased social value (Nalewaik and Venters, 2009) are connected with Green Buildings. Presently people are more concerned about climate change, cost and lack of resources, health issues so they are emphasizing in Eco-structure building (USGBC Report, 2008).

According to Federal Environmental Executive of U.S. (2008), "Eco-structure building has developed as a holistic approach and practical answer to the environmental and health burdens of the conventional built environment". Green buildings not only have some commercial

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benefits, but also have some social and environmental advantages (Yap, 2007). According to one federal report, eco-structure can also be defined as: “the practice of (1) maximizing the efficiency with which buildings and their sites use, generate and recycle energy, water, and materials, and (2) minimizing – and ultimately eliminating – buildings’ impacts on human health and the environment, through better siting, design, construction, operation, maintenance, and removal—the complete building life cycle”. Recycled, recyclable and non-toxic are used to build the Eco-structure buildings in order to lowering the effects on environment. (Ng, 2008) It is important to keep in mind, a building constructed today will realistically still be standing and in use at least For the next fifty years or more from now (Jablonska et al., 2010) we will be using the buildings constructed today. From the production to the demolition a building’s 10-20% energy consumption depends on the whole process including manufacturing, construction and renovation.

Importance of Green Design & Construction for a Better Tomorrow

Sustainable buildings have been the way of life in India for centuries. All the ancient structures were skillfully built, using locally available resources and incorporating features in harmony with Nature.

All our ancient places of worship, palaces & homes were conceived and built as Green Buildings. For instance, The Kashi Vishwanath Temple in the City of Varanasi, and The Taj Mahal in Agra, are excellent examples of this approach.

Conclusion

While managing urban growth, urban expansion and urban development, Bangladesh faces enormous challenge. To battle climate change, reduce energy bills, and diminish our reliance on fossil fuels it is mandatory to construct new eco-friendly projects, renovate existing construction in ecofriendly buildings which will also lower the cost. In an up growing trend of population, it is obvious to follow eco-structure for our well-being. Goals of eco-structure construction can be attainable if there is cooperation between the public-private partnerships. By embracing the future and the change it will bring, we will achieve a balance between ourselves,

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our lifestyles, and our environment. Though Bangladesh will be an urbanized country in demographic statistical term in less than four decades from now, but the nature of urbanism in the future remains rather indefinable. Political and cultural bindings, the threat of the climate change phenomenon and the crisis of governance at the national as well as urban local levels, all tend to make one feel uncomfortable, to state the least. Though we are facing acute urbanization problem, we have the hope to grow up with eco-constructive city within a few decades.

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Disaster Knowledge Management - A Study

Dr. C. Muthuvelayutham
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Abstract

Disasters bring about the loss of lives, property, employment and damage to the physical infrastructure and the environment. The number of reported disasters has increased steadily over the past century and risen very sharply during the past decade. While knowledge management can enhance the process of disaster management, there is a perceived gap in information coordination and sharing within the context of disaster management. Identification of key disaster knowledge factors will be an enabler to manage disasters successfully. This study aims to identify and map key disaster knowledge success factors in managing disasters successfully through capturing good practices and lessons learned. A list of disaster knowledge factors was first identified through a comprehensive literature review, covering the whole disaster management cycle. Based on these literature findings, semi-structured interviews were conducted among few disaster management practitioners to explore the influence and lacking areas relating to these factors in managing disasters. The objective of this paper is to present the interview findings on benefits and challenges related to the disaster knowledge factors. A comprehensive list of benefits and challenges of disaster knowledge factors in managing disasters is identified.

Keywords: Disaster Management, Disaster Knowledge Management, Disaster Knowledge Factors, Benefits, Challenges

Introduction

The economic crisis situations and the complex environmental and societal processes over the past years indicate the need for new mathematical model constructions to predict their effects. The health diagnostic as a multi-parameter and multi-criteria decision making system is one of the models whereas in the previous examples, a risk model should be managed. **Haimes (year)** gives an extensive overview of risk modeling, assessment, and management. The presented quantitative methods for risk analysis in are based on well-known mathematical models of expert systems, quantitative optimum calculation models, statistical hypothesis and possibility theory. The complexity of the systems increases the runtime factor, and the system parameter representation is usually not user-friendly. The numerical methods and operation research models are ready to give acceptable results for some finite dimensional problems, but without management of the uncertainties. The complexity and uncertainties in those systems raise the necessity of soft computing based models.

“The private sector, from Fortune 500 companies to your local grocery store, is an essential member of the team.... Growing strong working relationships between emergency managers and the private sector is a good business decision for everyone – it helps us better serve survivors, rebuild our communities and boost local economies.” **Please cite the source.**

Nowadays the expert engineer’s experiences are suited for modeling operational risks, not only in the engineering sciences, but also for a broad range of applications. Wang introduces the term of risk engineering related to the risk of costs and schedules on a project in which there is the potential for doing better as well as worse than expected. The presented case studies in his book are particularly based on long-term engineering experiences, for example on fuzzy applications, which offer the promised alternative measuring of operational risks and risk management globally. The use of fuzzy sets to describe the risk factors and fuzzy-based decision techniques to help incorporate inherent imprecision, uncertainties and subjectivity of available data, as well as to propagate these attributes throughout the model, yield more realistic results. Fuzzy logic modeling techniques can also be used in risk management systems to assess risk levels in cases where the experts do not have enough reliable data to apply statistical approaches.

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Disaster Knowledge Management - A Study

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Knowledge management is a process by which knowledge is created, shared and utilised (Deshmukh, et al., 2008). While abundant of knowledge about risk and vulnerability to hazards exists, its access and utilisation at community, national, regional and international levels to empower or protect is yet to reach full potential (UNESCO et al., 2005). Kaklauskas, et al. (2009) indicate that in countries affected by Asian tsunami the lack of knowledge management is apparent. By reinforcing this fact, Korla (2009) finds that in Sri Lanka organisations have not been able to capture, retain and/or re-use the learning from similar operations. This resulted in 'reinventing the wheel' in terms of setting up and managing the construction programmes and projects within the tsunami recovery operation (Korla, 2009). According to Pourezzat, et al. (2010), disaster response is dynamic and therefore decision makers need to receive updated information on the current emergency situations. Disaster response is also time-sensitive with little allowance on delay in decision making and response operations. Therefore, any problem or delay in data collection, access, usage, and dissemination has negative impacts on the quality of decisions and hence the quality of disaster response. All these highlight the importance of managing knowledge within the context of disaster management.

Significance of GIS in Disaster Management

Present disaster management represents a complex set of operations including various pre- and post-disaster measures. Those measures are planned and realized by various organizations such as fire and rescue services, emergency medical services, police, or local authorities. Those organizations have different structures, routines, etc. It brings new problems to disaster management and also increases its complexity. To overcome such problems a new concept, which could be resistant to different types of organization structures and various diversities, seems to be necessary. This concept is based on GIS that is independent on number of participants in disaster management, their structure, routines, and possible changes of those factors. GIS in disaster management can be seen as a cycle, consisting of eight elements: (1) assessment, (2) prevention, (3) mitigation, (4) preparedness, (5) disaster event, (6) response, (7) recovery, and (8) evaluation. Over the classic disaster management scheme, the scheme for GIS

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includes new element called 'evaluation'. This element is added to the cycle to evaluate GIS and its performance in disaster management, and also emergency management itself.

Benefits of Disaster Knowledge Factor

Technological factors Respondents identified that early warning systems such as effective flood warning systems and effective tsunami warning systems are enormously helpful in managing disasters successfully. In addition they highlighted the use of satellite images to gather real time data during and aftermath of a disaster. As an example, respondents elaborated the use of satellite images to monitor the actual movement of people during the conflict in Sri Lanka and to plan the resettlement process after the conflict. Similarly Geographic Information System is another technology that is mentioned by the respondents to estimate the scale of damages immediately after a disaster. They suggested the usability of robots technology to access too dangerous areas for humans to access during relief operations. Alternatively they proposed the use of reflective waves like laser or radar technology. According to respondents' views, the real time data gathered during the relief phase would help to plan and allocate the resources efficiently. Furthermore they pointed out that, this information is useful in planning mitigative measures as it helps to identify the vulnerability of different areas. Moreover, they described the support of ground transport and helicopters to rescue people and distribute goods and services especially during the relief phase. In addition, respondents recognised the importance of structural measures or product modelling to enhance the resilience of built structures. The use of technology for insurance purpose was highlighted by the respondents. For instance, as certain technological tools can mitigate the risk of flooding, these can ensure the successful claim of money.

Social Factors

Social factors are seen as essentials in managing disasters by all the respondents. Accordingly, the extent of peoples' network and the culture of preparedness are two major determinants of the successful disaster management. For example, helping each other is embedded in Sri Lankan culture and that was one of the reasons for successful relief after the

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2004 tsunami. Therefore, Japan is among one of the world's developed countries even if a major earthquake takes place in every year. Education, training and awareness raising are stated to be the key factors which contribute to enhanced culture of preparedness.

Environmental Factors

According to the respondents' views, natural environmental barriers can prevent or minimise the effects of a disaster. As an example, some of the areas in Sri Lanka had minimum effects from 2004 tsunami, because of the vegetations and mangroves. Nevertheless, they stressed that the environmental factors can also further the effects of disasters. Within this context, the role of the built environment was highlighted by the respondents as built environment shapes the natural environment. In doing so, they argued that people need to consider three things: firstly to decide whether people can live as safely as possible within a particular environment, secondly to plan and regulate the built environment accordingly, and thirdly to build man-made barriers to minimise disaster effects. For example they highlighted the use of the Thames barrier as a flood defense in London and the wall built around the sea of Netherland as the country lies below the sea level.

Legal Factors

According to the respondents, implementation of disaster mitigation measures is undoubtedly supported by disaster related laws and regulations. As lack of investment on disaster preparedness and mitigation hampers disaster management, statutory requirements imposed on mitigative measures act as a benefit to the community. In addition, emergency and civic duty laws are considered to be helpful in responding to a disaster. Respondents highlighted the fact that law should get the upmost commitment from the government and further the awareness and incorporation of them into training programmes.

Economic Factors

Economic planning measures: Respondents viewed that long term economic planning measures basically help to withstand or reduce the effects of a disaster through safeguarding the

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country's wealth generation mechanism. As an example, in most of the flood prone areas in the UK, the government, property developers and mortgage companies enforced people to take insurance as a mitigative effort.

Financial Factors

According to respondents, finance is an essential resource in managing disasters. Therefore funding and access to funding is an essential requirement in successful management of disasters. In the UK there is an efficient system to assess the damages and provide the financial support immediately after floods. Loss adjusters, who employ immediately after the floods, assess the losses in monetary terms while working closely with insurance companies to minimise the impact of flooding.

Institutional Factors

According to the respondents, institutions and organisations are again essential elements in disaster management as these are considered as the working norm of the disaster management system.

Political Factors

Respondents view that making decisions, allocating resources and enforcing statutes and legislations are influenced by politics. As an example they highlighted the confession by US president to institute new laws on oil spill due to recent BP oil spill over, which was one of worst environmental catastrophe in America.

The Challenges

A major challenge is to understand what and where the obstacles are and to learn what strategies exist for dealing with these hurdles. The most common barriers are listed below: All phases of disaster management depend on quality data from a variety of sources. Access to the appropriate data is very limited, thus the issue of data standardization in Nigeria and the lack of established Spatial Data infrastructures. The limited availability of trained staff to utilize the

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functionalities of a GIS or even the limited ability of disaster officers to use GIS as a tool that will add power to and make disaster management more efficient. The issue of politically define boundaries- Natural hazards does not recognize political boundaries, yet policies generated to mitigation against disasters inevitably speaks political boundaries. Inadequate administrative systems, it is found that administrators resist change and therefore an important issue is to gain senior management acceptance and make the necessary arrangements to facilitate sustainability.

It is important that disaster managers recognize that proper planning is a key to a successful GIS. The implementation of a GIS can be a very expensive process however; one should bear in mind that disaster management is an investment, thus the need for adequate budgetary provision by all tiers of government in Nigeria. The lack for greater responsibility and accountability for vulnerabilities and lack of greater emphasis placed on disaster management through greater public education in matters of disaster management by meaningful stakeholder consultation and collaboration.

Discussion and Way Forward

This paper has presented benefits and challenges of disaster knowledge factors in managing disasters. Respondents viewed the detection and warning systems and resilient built structures as key benefits of technological factors. While detection and warning systems help to save lives, resilient built structures supports to minimise the effects of disasters. With regard to the social factors, respondents indicated that technology can provide only the information and it would be the human beings who will have to react for disasters. Hence they highlighted the benefits of education, training and awareness raising to enhance the level of preparedness. The benefits of existing natural environmental barriers are highly recognised by the all respondents. Support of legal factors to implement disaster mitigation measures is also highlighted by the respondents. In terms of economic factors, benefits of long term economic planning measures were stressed by the respondents. In addition they viewed the financial, operational/managerial and institutional factors as essentials to manage disasters. Among key challenges, the lack of detection and warning systems, the need for effective education, training and awareness raising

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programmes, the need for regular updating of disaster related laws, lack of funds for economic planning measures, poor planning, poor communication, poor leadership, lack of knowledge management and poor institutional arrangement were highlighted by most of the respondents. These clearly show that most of challenges are related to the operational/managerial factors. In order to enhance the management of disasters, these challenges need to be addressed.

Conclusion

The integration of GIS to Disaster Management requires a careful and well-developed plan, which addresses administrative issues, costs, the range of users and the anticipated information products as well as the need for sustainability. There must be buy in to the need for incorporation of GIS in Comprehensive Disaster Management. It is important to understand that while GIS can enhance the existing disaster management programmes in Nigeria, its integration requires broader management and institutional issues be addressed. Technological advances and extensions of geographic information systems have opened the way for several applications in disaster management. The kind of analysis available to researchers, policy advisors and decision makers were only being dreamed of ten years ago (Amdahl, G., 2001). It is envisaged that disaster management in Nigeria will progress to the point of an automated disaster management information system built on web enabled GIS Technology in a multi-user and multi-agency environment. GIS is not a panacea but can facilitate loss reduction and event prevention in some instances as well as lead to more efficient means of recovery and rehabilitation in disaster management. This is however only possible through much research and education in this field.

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