

# **Technology and Management – A Quest for Synergy**

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## **Abstract**

No one can deny the fact that present day society is technologically paralyzed and market is being more and more customer driven where people are enjoying “fast life”. Modern society achieved the present day status not only because of the technology but also due to the ability of technologists, who created it, to foresee the technology through the prism of technology, business and society. Those who could not, merely remained in history.

It is not only the technological developments, but also how effectively one manages the technology and other resources is what enable them to stand ahead in this modern competitive business world. That is where the blending of technology and management creates a synergy.

For any engineers / technologists, as the career path progresses towards managerial level, the skills required also change from more of a technical to HR and conceptual skills. These are required to manage people besides managing machines and products.

From the product development point of view, technologists having the managerial ability to foresee the commercial viability of their concept / idea will ultimately rule the market.

# Table of Content

	Page No.
Abstract	i
1. The Reality	1
2. Human Society Vs Technology	2
3. Role from Technical to Managerial	3
4. Dual Role in Product Development	4
5. Technology and Management: A Synergy at Nepal Telecom	5
6. Experience from Thailand	6
7. Learn from Failure: LiveDoor Scandal	7
8. Conclusion	8
9. References	9

# 1. The Reality

*“Radio has no future.”*

Lord Kelvin, Physicist and the president of the Royal Society, 1897

*“I think there is a world market for may be five computers.”*

Thomas Watson, Chairman, IBM, 1943

*“There is no reason anyone would want a computer in their home.”*

Ken Olson, President, Chairman and Founder of Digital Equipment Corporation, 1977

These are some of the extracts conveyed by some eminent persons in history. Today anyone can say that these are merely their inability to foresee the revolution that these technologies can bring about to human society. Modern society has seen a paradigm shift to the present day status due to the incorporation of these technologies into day-to-day lives of ordinary people. Whether it is the invention of wheels, or the diffusion of the Internet technology from US defense to the general public, or invention of vaccines/ enzymes in the field of biotechnology, they have influenced the human society and those, which have not been able to influence, have remained in history.

Today, technology, for the shake of technology has no meaning. Also there are very few successes for those involved in this field who are not able to use/ bring those technologies in the wider scope of the society. Because today’s technologists / engineers, have to view technology through the prism of technology, business and society. Due to the ever increasing human needs and demands, countless discoveries / inventions / innovations are visible almost everyday. More interestingly, these have resulted customer driven market where commercial viability of every technological and/ or product development is essential.

Engineers / technologists and managers of today and tomorrow are facing the challenges to create a successful technology/ product in the market. What enables them to stand ahead as a market leader in this fast moving, technologically paralyzed, customer driven business world is the ability to foresee the commercialization of their concept and/or idea. It needs the expertise in developing those concepts and/or new technology and then bringing that to the market/ society. And that is where the synergy between the right technologies with right management approach needs to be created.

## 2. Human Society Vs Technology

No doubt, the 21<sup>st</sup> century has seen extra-ordinary advancement in the world of technology and the quest is still on. Modern society has seen discoveries / inventions of un-paralld magnitude and propositions. The impact of these modern technologies on society has been undoubtedly beneficial but some might argue the contrary. For good (or evil), technology's essence ruled the modern world. People today are technologically paralyzed and without it, many functions necessary to present day living come to a grinding halt. It is impossible to estimate the magnitude that technology has contributed in building up of present day civilization. Modern technology has resulted in shorter and comfortable working days, higher agricultural and industrial productions, better transportation facilities and what not. Every time we work out, we make use of technology. Technology has become the medium of daily life in modern society and will always be seen as 'prime mover' in history. The history of technology is still unknown and experts argue that it is parallel to human history.

The relationship between society and technology is quite complex and co-dependent. Social phenomena heavily rest upon technology and society creates technology to meet its needs and desires. On the other hand, technology creates further needs and desires in society. This symbiosis influences and eventually changes society. In other words, the needs of society change, generates more needs and hence more technology and the converse is true. Social changes due to technology are visible in every aspects of the society including economical, legal, political and many more. Significant changes have been observed in social customs and social relations. It has influenced the way people in society relate to what they perceive to be mysterious and the way society determines what is right and wrong.

As Karl Marx stated, *".....the formation of social relations, mental conceptions and attitudes are dependent upon technology"*.

Present day 'digital age' society is getting narrower and complicated than ever before and people are enjoying the "fast life". Technology creates ideas to justify economic structure of society. It has transformed the attitude of "putting ourselves first" into "putting people first", a paradigm shift, resulted due to the vision to incorporate technology into the everyday lives of ordinary people which ultimately has shaped and constructed the social structure. Marx's statement regarding class struggle can be re-written in terms of technology as "The history of all hitherto existing society is the history of technological advancement".

### 3. Role from Technical to Managerial

Advancing from full time technical assignments to managerial positions is a common career path. This transition from technical (i.e. non-managerial) position to managerial assignments is a difficult one. An engineer/technologist performs much of technical work requiring expertise in specific area and broader knowledge in engineering/technology as a whole. As the career progresses, the responsibility changes towards managerial level which requires more of organizational along with the conceptual skills. The concept is depicted in the figure below

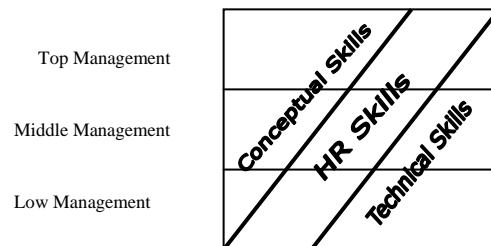


Fig: Management Level Vs Skill

Skills required to be an effective manager are different and his/her performance will be unpredictable. Technical jobs are mostly concentrated on operation and maintenance, production / manufacturing, consultancy and teaching. The technical world is governed by standards, regulations, code of practices etc. By nature, technologists/ engineers are very logical in their approach however they tend to focus too narrowly on any given situations. For many engineers, there is only one solution to a given problem. They are system bound, want clear cut, well-defined and well managed situations. For them, two plus two is always four.

Fortunately / unfortunately, managerial world is entirely different. Unlike engineering/technology, which deals with machines, products, systems etc., management is all about understanding people; motivating them, leading, controlling, directing and whatever possible way to get things done. This makes the job of a manager more complicated as s/he has to manage resources. A manager is always confronted by ambiguity and complexity inherent in human interactions. As a manager, one will be expected to place more emphasis on human behavior. Role as a manager requires thinking ahead in unique and independent ways and take on challenging tasks. Unstructured situations are very usual and a manager has to interpret information needed for effective decision making in good times and ensure that implementation follows. For them two plus two may not be four.

Contrary to engineering/technology, management is more of an art than science – no easy and fast solutions exist, but many possible solutions to a given problem. Technical skills blended with managerial skills will thus have all aforementioned (and several others) qualities required to manage people besides managing machines and products. Managerial knowledge for an engineer/technologist acts as a toolkit to approach towards the challenges more effectively by having the introspection as where s/he stands.

## 4. Dual Role in Product Development

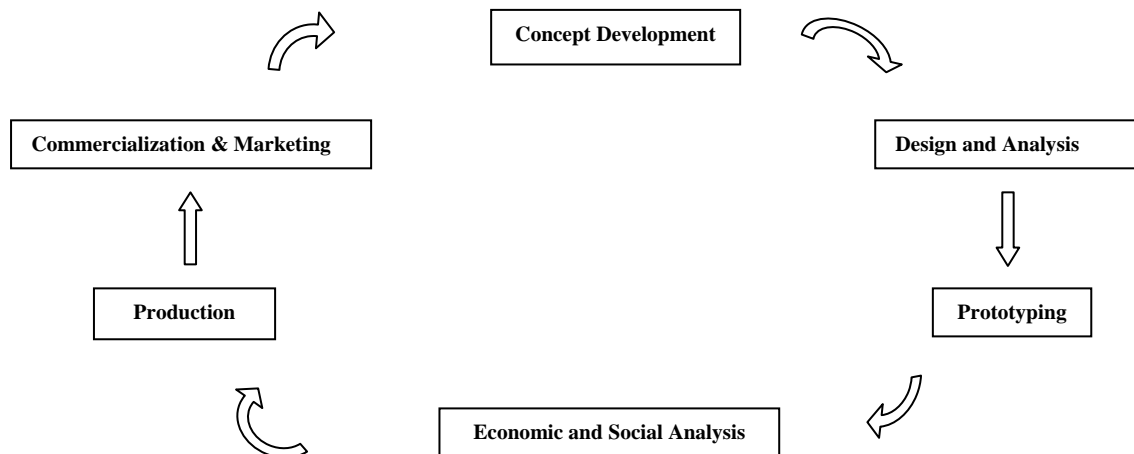


Fig: Basic Product Development Life Cycle

The success of a product depends not only at the stage of commercialization and marketing but right from the concept development stage. During concept development, design and analysis, prototyping and production, the job is more of technical and only technical person can more effectively and efficiently accomplish the desired results. Whereas, at socio-economic analysis, and commercialization & marketing stages, more of the managerial skills are required.

But the people responsible for the concept development, analysis and design should have the ability to foresee production complications and should have the marketing insights also. And hence, without managerial skills, the chances of success of the concept at the time of commercialization are less. Engineers/technologists, blended with managerial flavor are able to acquire the vision of commercializing his/her concept and hence higher will be the probability of success of the concept and the product.

As an example we can take the pharmaceutical industry. Today almost every drug manufacturers are involved in one or the other form of research for producing new drugs/ enzymes. Most of them are able to involve in a high investment research. But the list of manufactures who have been able to successfully bring those drugs and enzymes in the market are those who have the strong research base along with the strong management team to market those drugs and to secure the future of these drugs once in the market by getting the right patents.

Google is one of many lively examples. Started by two technologist as merely a search engine, managed and marketed the company in such a way that it has been able to raise one of the highest amount of money through Initial public offering (IPO) in the US stock market. The popularity of google.com reached a height that today it is no more just a search engine but is the perfect blend of technology and management.

## **5. Technology and Management: A Synergy at Nepal Telecom**

Nepal Telecom, registered in the name of “*Nepal Doorsanchar Company Limited*”, is Nepal’s largest and the first telecom service provider. Over 750 thousand valued customers (both land line and mobile) are being served through its 206 exchanges in 72 districts. More than five and half thousand employees are devoted for nation building through customer satisfaction.

Nepal Telecom is the trusted partner of people of Nepal since 1975. Because of the quality of service being provided, demand is ever increasing. As the private operators have entered into Nepalese Telecom Industry, competition has further intensified challenges. Nepal Telecom has always been dedicated to treat its customers (who wish to buy its services) with the same respect deserved by its clients (who are using its services). After all, a customer / client is the boss; their satisfaction is affordable and always profitable.

Success of Nepal Telecom is directly linked with customer satisfaction for which it is committed to. Everyday, officers (or say managers) are confronted by soaring number of people and their satisfaction is the greatest challenge. Several customers enjoy verbal jousting and for even though defeated, they argue still. Sometimes, customers are right and expect more than can legitimately be provided. In such scenario a serious challenge lies in front of the service personnel as how s/he deals with customers to satisfy them to the fullest. So, s/he must, in addition to being technically sound, be an expert in handling people. Nepal Telecom has adopted this strategy for quite long time and so all office in-charges are blended with the flavor of technology and management. Only a person having technical background in the organization (not limited to engineers) qualifies for the post of office in-charge. S/he then receives substantial training on management development to prepare him/herself as the successful manager of today and tomorrow.

Basically, service cycle of Nepal Telecom includes four major steps viz. (a) technology selection, (b) procurement, (c) installation and commissioning and (d) commercialization. Only a person having broader technical knowledge and expertise can select the appropriate technology and efficiently accomplish the job of installation and commissioning. Procurement and commercialization demand more of managerial knowledge but the person involved has to have technical background as well. To sum up, the quality of service that Nepal Telecom provides largely depends on proper blending of technology and management. Since Nepal Telecom is half equipment and half people based organization, technology sets up a concrete platform and management enables to stand as a market leader. Such blending is visible where majority of top and middle level managers are engineers. It is their ability to manage available resources that put Nepal Telecom in the path of success.

In Nepal, few technology based organizations in which the highest (and other key) position in organizational hierarchy is occupied by non-technical personnel have encountered with devastating results because of their inability to blend technology and management. Fortunately, Nepal Telecom reserves the position of Managing Director and Deputy-MD (except DMD- finance, administration, and internal audit



and inspection) for engineers only. Every engineers of today perceive themselves as the managers of tomorrow. Also the top management has incorporated its vision to prepare engineers as leading managers of tomorrow. So, Nepal Telecom has started training its engineers in management through its own resources and inviting academicians, business personnel, consultants from outside as well.

## **6. Experience from Thailand**

Thailand Institute of Scientific and Technological Research (TISTR) is a stake enterprise established in 1963 under the Ministry of Science and Technology, Government of Thailand. TISTR intends to create value on science and technology and utilize both in production and environment protection in order to develop competency of Thailand. Functionally, TISTR is involved in testing food and food products for Food and Drug Administration (FDA). Besides, by Research and Development in science and technology, TISTR assists in value addition for agricultural and industrial products.

Having more than seven hundred employees monitored by a technical person, TISTR is functionally divided into four major departments namely Research and Development, Technology Transfer, Services and Administration. Former three departments are headed by technical personnel. This has resulted in appropriate selection of research area according to the national policy and fast decision making processes. In 2005, TISTR carried out researches in several sectors and came up with some noted developments as Lemon Powder (an air freshener), Medical Vibrator (for ultra sonic equipment used in hospitals) and Ethanol From Tapioca. Such developments have given TISTR the pride of leading bio-chemical and micro-logical laboratory in Thailand. The success is the result of proper management of all 3Ms (i.e. man, machine and material) without which TISTR could not perhaps dare to make this venture. This is one of many success stories that explains success of an organization lies on the blending of technology and management.

## 7. Learn from Failure: LiveDoor Scandal

Livedoor's maverick, Takafumi Horie, 33-year-old boss is a well-known personality in Japan and is supposed to be the ultimate embodiment of "kachigumi" (winners), a phrase that became a recent buzzword. Livedoor, one of the fastest growing net ventures in recent history, is one of Japan's best known IT companies, and offers consulting, telecom and software development services. Its stock has soared in recent years as the company has continued to expand. Internet related businesses form the core of Livedoor's operations, but the company has lately aggressively pursued a policy of corporate mergers and takeovers through exchange of shares and it had grown inorganically through a series of acquisitions and stock splits.

A university dropout, Mr Horie - president and chief executive of Livedoor - shot to fame following separate failed attempts to buy a TV company and a baseball team. But now, Horie is on the brink of facing criminal prosecution. He has come under suspicion of violating the Securities and Exchange Law. Prosecutors are building up two cases, both of which are related to information disclosure concerning a Livedoor affiliate. The affiliate is suspected of misinforming the public in October 2004 by announcing it was going to take over a publishing company, when in reality it was already substantially owned by Livedoor. Media reports suggested the firm was being investigated on suspicion it had spread false details about a subsidiary in order to boost its stock price and Mr. Horie is now in custody.

This down slide of Livedoor speaks a lot about the importance of the third face of the 'prism', the social face. Livedoor did very well in technology and exceptionally well in the business/ economy. But the responsibility of the company toward the society, the social responsibility, i.e. stakeholders was undermined. Today Livedoor and its top notch management team is in the brink of failure.

What is the lesson from Livedoor then? In today's competitive and customer driven environment, having the best technology and being the best in the stock market is not just sufficient. May be yes in the short run! But the manager and the technocrats of today and tomorrow should also consider their society as of the important criteria and should take up their social responsibilities, if they and their organization are to stay ahead in the long run.

## 8. Conclusion

Today, no doubt that technology has to be viewed not just as a technology rather through a prism of technology, business and society. Social needs and demands have created new technology and vice versa. Technology has become the medium of daily life in modern society and will always be seen as prime mover in the history.

The world is moving faster and it's getting complicated. Confrontation to several hassles compels us to manage so many things a day. Knowingly / unknowingly we are performing managerial roles to make our living comfortable and to get things done the way we want. Some of good management can also be classified as "common sense", however, this does not work as we enter into the business world. The success of every organization is directly linked with appropriate technology and better management. Managing the tasks and managing the work / personal lives of people who accomplish the task are the serious challenges within any organization. Work life is no longer a physical act, rather it is an emotional experience. A person assigned with a job thinks first (emotional) and then only acts (physical). Lack of sensitivity to workers life brings devastating results to the organization. Only the blended product i.e. engineers / technologists with managerial knowledge and skills know how to do both at a same time. Effectiveness lies at doing right job and efficiency lies at doing job right. As the organization enters into modern, smart business world, the knowledge that can bridge the gap between technology and management leads an organization to the road of success. This ever changing deed requires blending of technology with management to give fruitful results. After all, engineering is blind and management is an eye opener.

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