



Technological management and innovation in organizations: A systematic review of the literature

Gestión tecnológica e innovación en las organizaciones: una revisión sistemática de la literatura

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ABSTRACT:

This paper will review past researches on technology management and innovation in firms. Various research articles will be viewed and analyzed to come up with conclusive results.

Keywords: Management, technological, innovation, organizations

RESUMEN:

Este documento revisará investigaciones anteriores sobre gestión de la tecnología e innovación en las empresas. Se verán y analizarán varios artículos de investigación para obtener resultados concluyentes.

Palabras clave: Gestión, tecnológica, innovación, organizaciones.

1. Introduction

Technology has greatly influenced the way organizations are run and managed and run. Technological management is the process by which organizations control, plan, organize and coordinate their technologies (Chae, Koh, & Prybutok, 2014). Innovation is the process through which organizations come up with new ideas and methods of carrying out businesses. The rate of technological advancement has grown tremendously in almost all fronts. Technology has influenced every aspect of the business environment. There is a shift in the way organizations undertake marketing, advertisement, hiring and competition (Laudon, & Laudon, 2013). The global economy is one of the major developments which has resulted from technological and innovation advancements. Firms are no longer competing in the confines of national boundaries, but at the global front where innovation is the key to survive.

Innovation has changed the way in which products and services are produced and availed to consumers. New technologies have enabled firms to produce and market in more subtle

ways as compared to the traditional methods of production and marketing (Norman, & Verganti, 2014). New methods of value creation and product differentiation have been borne by the rapid changes in technological management in organizations (West, & Bogers, 2014). Innovation encompasses various fields such as computing and data storage. Data storage in organizations has in recent years with firms shifting from the traditional methods of data storage to modern methods of storing data. The use of cloud computing, for instance, has enabled firms to store huge amounts of data using very little space. Innovation in technology has enabled firms to compete favorably by embracing new opportunities in the market.

Organizations are facing very high pressure to maintain competition in rapidly changing environment. Disruptive technologies are changing the way businesses deal with uncertainties and challenges (Zhang, Chen, Porter, Zhu, & Lu, 2016). Technology has enabled firms to create new employment opportunities while at the same time enabling firms to be more efficient in production. Management of technology and innovation is important if firms have to have an upper edge over competitors (Goetsch, & Davis, 2014). Managing technology and innovation will enable firms to reap maximum benefits in technology, while at the same time, overcoming any challenges brought about by the new technology. New technologies have enhanced product and service quality. Firms use innovation and technology in marketing, branding, advertising, office automation and security systems (Saebi, & Foss, 2015). Innovation has enabled firms to come up with cutting edge technologies in various departments. This research will address the areas in management of organizations which have been affected by innovation and technology. The opportunities as well as the limitations of new technologies will also be reviewed. The research will review previous scholarly articles in the area of technology and innovation

The study will focus on the various forms of organizations and how they manage innovations and technology. The study will seek to know whether firms use the same methods of managing innovation and technology. Specifically, the study will seek to determine what motivates organizations to adopt certain methods of managing innovations and technological advancement and not others. The study, for instance, will seek to understand how management decisions affect technological and innovation strategy, which a firm should undertake. Multiple case studies will be used to explore the differences and the similarities between various case studies. The results from the different cases will be used to predict trends and come up with a conclusive recommendation.

2. Methodology

This review will examine the various ways in which organizations maintain and manage technological and innovation advancement. Various theories concerning innovation and technology advancement will be reviewed and the results will be compared. Specifically, the study will examine ten peer reviewed articles to determine what aspects of management are used in technology and innovation in organizations. A reflexive approach will be used to determine the views of the researchers in that field (Nankervis, Baird, Coffey, & Shields, 2011). An in-depth analysis of the existing research will provide information regarding technology and innovation.

The knowledge will be used to draw conclusions and support hypothetical information on the role of management in innovation and technology. There is a wide range of debates concerning the role of innovation and technology in business organizations. Philosophers, academicians and managers provide diverging views on technological innovation and management (Jackson, Schuler, & Jiang, 2014). Though all the stakeholders agree that technology has had positive impacts on management and the way business are run, it has become increasingly difficult to quantify the extent in which technological innovation and management are intertwined. This research will offer an insight on how organizations manage innovation and technological management.

The research will use qualitative techniques to determine the underlying issues in technology and innovation in organizations. External links between management and innovation will be examined. The motivations which lead organizations to embrace new technologies will be

examined. The realities between the real world and the theoretical frameworks will be examined. The research will, for instance, examine in what ways the existing research explains management decisions in choosing the technological approach to undertake.

The research will use various resources in coming up with conclusions. This will offer a multifaceted approach in dealing with the subject issue at hand. The problem of generalization which is associated with a narrow area of study will be avoided (Smith, 2015). The use of multiple sources, as proposed by Lewis (2015), will ensure that the issue is well explored, and no subjectivity is employed. Pluralism in qualitative research can only be realized only when various sources are used (Hussein, 2015). The use of limited sources in the past has proved to be very ineffective and has caused fatal errors in research. The human behavior is subjective and any study from one source may be subjective to bias. The use of various sources will eliminate any cases of subjectivity. This study provides information which cannot be manipulated by the researcher. The respondents are independent in making their decisions.

Cross case synthesize method will be used to analyze data collected in the researches. The data from all the researches will be analyzed to come up with convergent information. The various factors and motivations which drive managers to choose innovation and technology method to use will be analyzed. This will give an insight on the underlying issues which drive managers to prefer certain innovations over others will be analyzed. The research will involve all the empirical data from other resources to ensure that a comprehensive research analysis is achieved. The analysis will provide vital information which will; be used to explain the missing links and conclusions between management decisions and innovation in organizations. Additional information will be critically evaluated to check whether this information tally with the research findings. Peer examination of the data will be used to come up with conclusive ideas which portray the research findings. The results and conclusions from various researches will be checked for any linkages and differences. Any discrepancies in the research will be explained using credible data from the researches.

3. Results

Various researches have shown that there is a relationship between the management of the organization and the innovative. Different forms of organizations have adopted various methods of managing innovation and technological advancement. In the recent past, firms have invested heavily in areas such as IT to ensure that information is well guarded in the organization. Information and technology in an organization are important in ensuring that firms are not left out in the global market segment (Ali, Khan, & Vasilakos, 2015). This section will examine the results from the sources for the section found. Specifically, the research found out that firms have employed technology and innovation in information technology (IT), security, sales and marketing and hiring. This section will therefore address each of these scenarios in organizations. However, it should also be noted that firms have employed technology in almost every sector. The choice of these sectors follows extensive research literature review from the sources used.

3.1. Innovation and technological management in Information technology

Information technology is one of the major ways in which innovation management has contributed to the growth of businesses. Unlike in the past where innovation was associated with new products, innovation has now taken a broader definition to include services. Organizations are using information technology to provide custom made products. Innovations are designed to come up with custom made products. Through innovation, firms are able to generate the most ideal products which deal with customer need. The use of information technology has enabled organizations to collect information and compare it with those of rivals in the market (Balmer, Abratt, & Kleyn, 2016). There is high use of information technology in computing and retail stores where the information regarding consumers is stored and later used by management to come up with products that meet

consumer needs.

One of the major ways in which organizations are able to collect data on consumers is by the use of loyalty cards. Management decisions on how to utilize the information collected determines how a firm is going to fare in the future. By using of loyalty cards, firms are able to collect data and use it in satisfying customer needs. Firms can then come up with packages which are designed to better cater for consumer needs. This enables firms to retain customers by making them feel appreciated. According to Jeon and Choi (2018), the use of information technology is one of the major ways in which firms can compete favorably in the global market (Jeon and Choi 2018). Information technology gives firms an upper hand in ensuring that they have information regarding consumer needs.

3.2. Innovation and technology management in Organization's security

Another major area in which organizations are using innovation and technology management is security. According to Ferreira, Jalali, Meidutė and Viana (2015), cybercrimes and terrorist activities are a major concern in organizations. Firms have lost huge sums of finances and data due to terrorists and cyber-attacks. This has prompted firms to invest heavily in combating crimes and preventing attacks. Technological advancement is synonymous with global prosperity and efficiency. However, there are some drawbacks which lead firms to be vigilant when it comes to dealing with security breaches.

One of the major ways in which firms deal with cases of insecurity and security breach is by the use of block chain technology. Block chain technology allows firms to control illegal and fraudulent activities in the industry. Block chain technologies use cryptic data to reduce information breach to third parties. Block chains ensure that transactions are recorded permanently, thus offering information regarding all relevant transaction records. Block chains are used to ensure the privacy of financial transactions.

Another aspect which has gained popularity in ensuring security of firms is by the use of passwords and Personal Identification Methods (PIN). The use of sophisticated methods of securing facilities has necessitated firms to come up with security measures. The use of passwords and biometric methods of identification have proved to be effective in minimizing the risks of attacks in organizations. Large facilities are using eyes, fingerprints, palm prints and security cards which offer restricted access to facilities resources.

3.3. Use of technology in advertising, sales, and marketing in organization

Recent researches have shown that the internet has enabled firms to come up with new methods of marketing. The traditional methods of marketing have become obsolete and firms have turned to other marketing techniques to reach out to consumers. One of the major ways in which organizations market their products is through the use of internet marketing (Lin, & Kim, 2016). Internet marketing and especially the use of social media has provided firms with easy and reliable methods of reaching out to the consumers. Internet marketing and advertisement is much cheaper and more convenient to use compared to the traditional methods of sales. These modern methods of marketing have provided firms with cheap alternatives to market their products while at the same time reaching to the target population.

The major advantage of using the internet to promote products and market is its ease of use. Unlike the traditional medium of marketing, the internet requires less time and resources. Little training is required as compared to the traditional methods of marketing. It is easier to reach to the target group by using the internet than when using the traditional methods of marketing. One method of reaching out to the consumers is by using social media to reach out to the target group. Social media offer online platforms where firms and organizations can share their products with consumers.

3.4. Use of Technology and Innovation Management in Human Resource Process

The human resource is very vital in running the organization. The human resource manager is responsible for hiring, promotion and motivation of human resources in the organization. Human capital is the most significant resource in the organization because they determine how all the other resources will be employed. It is the work of the human resource to ensure that an organization gets the best human resources. The use of technology and innovation in human resources management enables organizations to retain and recruit the best talents in the field (Stone, Deadrick, Lukaszewski, & Johnson, 2015). Job supervision, promotion selection criteria and employees' retention criteria are among the ways in which technology is used by human resource managers to maintain the best employees in the organization.

Use of the best software in the recruiting process ensures that an organization gets the best workforce in the organization. The use of e- recruiting is one of the most advanced methods of sieving the applicants and ensuring that only the best get the job. E- Recruiting ensures that innovation is bred in an organization (Chowhan, Pries, & Mann, 2017). Innovative employees are likely to bring innovative ideas with them in organizations. Innovative workers ensure that consumers are satisfied and that all activities are geared towards maintaining customer loyalty., job satisfaction is another element which is brought about by competent employees who feel that they are not in the wrong work place (Paillé, Chen, Boiral, & Jin, 2014). The majority of the unsatisfied employees feel that they are working for the wrong company and this may affect the morale of workers in the workplace. Poor morale leads to poor productivity, which may in turn lead to workplace problems.

4. Conclusions

Technological advancement has improved the way businesses are carried out. Individuals and corporations are using technology in their daily operations. Innovative and technological management is used by firms to make decisions which have enabled firms to stay ahead of competitors. Firms should embrace new technology in order to have cutting edge technology in the industry. All the research reviewed has shown that firms are using technology and innovation to help them in daily running of their activities. The use of management decisions on technology and innovation has enabled firms to reduce costs while at the same time perpetuating efficiency. The rate of technology is expected to grow, and firms should tap from the expected growth in technology to reach new heights of customer satisfaction.

The use of technology has helped businesses to develop stringent security measures. The use of passwords helps computers to protect vital information and data. Loss of sensitive information in companies can cause stalling of business operations which in turn leads to losses. Use of passwords in organizations restricts the number of people who access vital information thus reducing the risk of data loss. E-recruiting is another area which is used by firms to get the best workforce in the industry. Human resource managers use E- recruiting to attract a pool of talented workforce which enables a firm to come with new ideas. Talented workforce is important in ensuring a firm is innovative. Innovation enables a firm to generate new ideas which meet customer expectations. Lack of innovation on the other hand will lead firms to face stiff competition in the industry. Majority of large corporations such as coca cola and AIG have research and development divisions which generate new ideas. technological and innovation management is therefore a management responsibility because it affects all aspects of an organizations. Managers should be well versed with new developments in technology so as to have a competitive edge in the industry.

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