

Managing Technological Change in Business Organizations

إدارة التغيير التكنولوجي في منظمات الأعمال

Saiti Adelatif , Professor Lecturer B, University of Ghardaia, without affiliated laboratory, Algeria,

saiti.abdelatif@univ-ghardaia.edu.dz

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Abstract:

Technological changes in business organizations are increasing rapidly and rapidly, and these changes continue to affect organizations in general and management practices in particular.

This paper identifies different types of technological change in business organizations and discusses the differences in relevant technologies and their implications for the adoption of these technologies.

So that the aspects of technological change in business organizations will be studied on the one hand, while highlighting future trends on the other hand.

Keywords: Technological changes; business organizations; Leadership and Change; Culture of Innovation.

Jel Classification Codes : I23 ; C88.

Abstract in Arabic:

إن التغيرات التكنولوجية في منظمات الأعمال تتزايد بشكل كبير ومتسارع ، ولا تزال هذه التغيرات تؤثر على المنظمات عامة وعلى أساليب ممارسة الإدارة بشكل خاص.

فتحدد هذه الورقة أنواعاً مختلفة من التغيير التكنولوجي في منظمات الأعمال وتناقش الاختلافات في التكنولوجيات ذات الصلة وتداعياتها على تبني هذه التكنولوجيات.

بحيث ستتم دراسة جوانب التغيير التكنولوجي للمنظمات الأعمال من جهة، مع إبراز الإتجاهات المستقبلية من جهة أخرى.

الكلمات المفتاحية: تغيير تكنولوجي; منظمات الأعمال; قيادة ; إدارة التغيير ; ثقافة الإبداع.

تصنيف جال: I23 , C88.

1. Introduction

Businesses face a constantly changing competitive environment, brought about by rapidly developing new technologies. These advanced technologies could offer improved operating efficiencies, reduced factory floor personnel, improved product quality, and the addition of competitive advantage. Therefore, it is important for the companies to manage technological change to stay and grow in today's new marketplace. Few decisions are more important to the continued existence of a business organization than those decisions that bring about technological change. Carefully reviewing and deciding upon those alternate technological changes with which the organization will be identified in the future may very well be the important responsibility of the decision-makers of today. The time of a company is a complex product of a dynamic environment, an appropriate technology, and the company's ability to adapt to external change. This ability is referred to as technological change. The company undergoing rapid changes at many hierarchical levels of operation presents management problems with underlying elements that require highly flexible decision-making. Adequate and timely responses to external challenges are of vital importance to the continued success of the company. Successful management of a company in a period of rapid changes requires, above all, the formation and implementation of sound technological change strategies. There is no empirical methodology for selecting a set of strategies that represents an optimal approach for each single company. However, the necessary foundation for sound strategy decisions can be established, and guidelines on how to implement these strategies may be designed. Technological change strategies for the manufacturing component of furniture firms are all aspects that this paper will briefly discuss.

2. Introduction to Technological Change in Business Organizations

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Today, every business organization must keep abreast of developments in advancing technology in its own field. The survival of the organization depends to a very great extent on its ability to adapt to the technological changes that enterprise, initiative, and planning are hallmarks of successful business organizations. Technological change in business organizations has manifested itself in a number of ways in recent years, and a proper recognition of these innovations and the administration of them appears to

be increasingly important. When a change is made in the equipment, process, product, etc., there is a possibility of a technological change. The business organization must cater to its research and development, where it undertakes such activities. Its operating efficiencies are the result of the introduction of an increasing number of technological changes.

Decision-making must be accomplished within fixed or available amounts of time and money. There has also been a growing need for improved management of research functions in general. The growing technology base of business has also produced an increased number of competitive advantages which can only be sustained as a result of such activities as managerial supervision of increased production design and development efforts, greater emphasis on the development and dissemination of specialized engineering or professional skills, and the development of the administrative abilities required to encourage innovative activities within the business enterprise, its employees, and its professional and technical associates who are not its employees but with whom it shares a common business interest. These needs should also point toward, or at least help to support, closer interdisciplinary ties between university business and engineering schools and other related research organizations. More effective utilization of new technology can also produce quality changes in administrative, customer services, or corporate operating functions which can indirectly benefit a complex, humanly managed business enterprise. (Farida and Setiawan2022)

Help from different sources has also been provided to guide the business organization on the change. The scientists and faculties of educational institutions devote time and energy to innovative research and development. The specialized entrepreneurs and businesses engage themselves in the work continuously. It is obviously necessary to work out the managerial criteria for a technological change. Such necessities as describing the change, involving further development of it after its initial consideration in management, are regarded as important. Business organizations are expected to judge the technology for their operations in different dimensions. Its impact on management, its requirements, the managerial response, and the guidelines to measure management are part of the problem. Only the organization that deepens management can guide the business better in viewing technology. (Al-Okaily et al.2023)

3. The Importance of Managing Technological Change

The study and the practical management of technological change have become vital to the success of business organizations today. The pace at which technology is changing, the rapid pace at which knowledge is increasing through the development of new technologies, and the increasing intensity of the competition faced by corporations are having a profound impact on the way business organizations conduct their affairs. The development of new products, new production systems, and new business strategies in order to meet competition and to grow are often inextricably linked to technological change. Managers today must be able to recognize opportunities and problems presented by new technology if they are to engage effectively in the management of technological change. (Pozzi et al., 2023)

One can loosely define technology as the techniques, tools, and systems used to transform resources into goods and services. Many business textbooks treat operations management as a broad intellectual framework for analyzing and improving the way goods and services are produced and their characteristics influenced. A central concern of the operations function is the responsible use of technological knowledge. Technological improvement involves foresight not only in the context of hardware and software development but also in terms of operating and service systems. I repeat: at the core of managing such change are operations management concerns. The operations management function involves ensuring that the corporation has the right kind of facilities, equipment, and personnel to achieve its business purpose. Operations management is also concerned with those critical fundamentals of competitiveness: quality, cost, and timing. The operations function also has a direct stake in the changes that occur within a business organization as a complex adaptive system. (Klein & Todesco, 2021)

4. Challenges and Opportunities of Technological Change

Both the managers and the organizations are facing challenges in the utilization of various information and communication technologies, in how to align the functions of marketing, marketing research, sales, human resource development, competitive strategies, and strategic development with technological change, or even in attempting to assess the organizational efforts in building distinctive competencies and carrying out the necessary shift from the traditional viewpoint towards serving the 21st-century customer. At the same time, new technology offers ever more possibilities for enhancing human intelligence. A straight and ideal picture of the impacts

of technology in the marketplace is still not discernible; the picture might be extremely confused because technological change affects firms, provided they wish to participate in the digital revolution. (Wang et al., 2020)

There will presumably be a range of businesses that will not be able to compete on a level playing field with the new digital economy; therefore, governments around the world must take a proactive role to help businesses, employees, and communities adapt to the ever more sophisticated market economy. A surprising number of strategic functions could remain immune to digital challenges, both from the short-term and medium-term perspectives. There are talks on the purpose-built large screen home kiosk, where people watching TV on their sofa could also be using it for email, chatting, or computer games, etc. Finally, given the likely deployment of various technologies, what are the likely challenges that firms are bound to face in integrating and implementing technologies into the present way of doing business? In the above context and in view of the challenges and opportunities available, the aim at the end of the paper can be seen as studying the perceptions of various actors within the business organization through the use of technology deployed in businesses. (Klitgaard, 2021)

5. Strategies for Implementing Technological Change

The introduction of change requires the development and implementation of strategies for minimizing the adversity that may be linked to change. The importance of planning for the introduction of technological change within business organizations has been noted. By effectively managing this process, organizations can save and develop human resources, as well as technological ones. Four primary strategies for bringing about technological change within business organizations have emerged from the literature: (1) clarity of planning and responsibility; (2) strategic implementation activities; (3) technical-force feedback in organizational decision making; and (4) other involvement activities. (Hanelt et al.2021)

The successful application of technological discoveries requires proactive planning. The intricacy of designing and organizing technological systems heightens the potential resources required, thereby placing a burden on any organization proposing the implementation of major new systems. In planning, clarity of directives, objectives, and milestones for the introduction of technological change is important. Once goals and objectives have been clearly expressed, they must be tied to distinct routings of responsibility and accountability. Such moves indicate that management has made the necessary commitment to become involved in, and has

allowed for the incorporation of, new technology. To properly plan, managers must address a series of issues related to organization and personnel. The reinforcing structure and climate of organizations must begin to shift in such a manner that will allow the initial adjustment required for successful technological change. Widescale participation will be found if departments and department heads eagerly assume responsibility in the implementation planning phase of technology. (Allioui & Mourdi, 2023)

6. Leadership and Change Management in Technology Adoption

The successful adoption and implementation of new information technologies depend on the careful exercise of leadership and management skills, particularly during the process of managing change. Every new evolutionary phase of information and telecommunications technologies is heralded as a revolution, destined to bring about radical improvements in productivity, service quality, and speed, as well as a transformation of business processes, organizational structures, administrative systems, and private and public services. (Timotheou et al.2023)

A Challenge for Change Management The introduction of change in the shape of new technology represents not only a challenge but perhaps the most critical function and responsibility of leadership. The surprise of the new generally demands a period of shock and adaptation. The unplanned and unmanaged arrival of change will tend to raise levels of frustration, resistance, and conflict, with the inevitable consequences that staff will change only when they see their situation as irrevocably untenable. The greater the number of actors involved in the change process and the greater the level of decentralization of their expertise, control, and responsibility, the more informal and participatory must be the organizational structure, management style, and behavior of the leaders and change agents involved. (Spagnoli et al.2020)

The Past as Prophecies Many of the past prophecies concerning the favorable effects of information technology were overambitious, and all revolutions, in society and business as in nature, are soon forgotten once overwhelmed by the arrival of the next. Yes, manufacturing has been transformed by the twin revolutions of robotics and automation, but to what purpose? If relatively few workers were engaged in production, and even fewer in supervisory and clerical work, would we still need managers, planners, administrators, supervisors, and secretaries in industry and in government? In that happy day of the technological utopia, the flows of information within and across enterprises and governments become

frictionless, and their processing instantaneous, who then will control and judge the propriety, quality, and legality of such gigantic flows of private and public information? (George & George, 2020)

7. Building a Culture of Innovation and Adaptability

A number of companies have been successful in increasing their capacity for innovation and improving their adaptability by building a corporate culture conducive to change. Long-range vision, sustained management commitment, and proficient leadership are necessary steps to turn these concepts into tools to shape organizational culture. The culture of change is, by definition, proactive and creation-oriented. The company must foster growth as a business priority, and managers must communicate and serve as role models for the appropriate behaviors. A key to building organizational culture is to understand how it has been created in the past and to use this knowledge as support for change. Ten years of experience document that corporate culture is management's single most potent tool for the management of change and is certainly the least understood. Corporate culture has its roots in vision and values or in the way groups of people in organizations think, believe, perceive, and understand; it is the 'social glue' of the organization. Corporate culture is something that we build and grow, and implement and maintain. We build and manage our corporate culture through leadership and management action and example; we grow and adapt our corporate culture through corporate regeneration and development, a never-ending process that ensures the organization retains a sustainable mix of behaviors. Clearly, leadership styles and responsibilities are related to the organizational culture and its change and development. (Naji et al., 2024)

8. Measuring the Impact of Technological Change

Assessment of the impact of technological innovation, particularly the impact of information technology, has received considerable attention in recent years. Performance improvements are expected if changes in technology are to be rationalized, justified, and supported. The question of how to measure these improvements has been widely studied. Conventional productivity measures and ratios such as long-term productivity growth or output per unit of input may no longer be adequate in the high-tech age. The output and input of the unit may be difficult to define when the unit is far removed from industrial production or agriculture. For a service industry, faster computer runs may reduce the time necessary to perform certain types of work, but speed alone may not be indicative of an important qualitative change in the value of the output. For a hardware company, increased

manufacturing quality through process control may be expected as a by-product of reduced labor intensity, and at worst measured by reduced sales from service contracts, routine maintenance, or drawing changes. The same argument is often used for decision and administrative support services. Rather than equating information technology with telephone poles, it is important to determine whether increased technology warrants more training, management costs, resources in the decision-making process, enhancement of coordination or communication, or qualifying characteristics of better decisions or organizational performance. There are many case studies that are descriptive, do not use grounded theory, and do not measure the dependent variable. (Cao et al.2023)

9. Ethical and Social Implications of Technological Change

Issues pertaining to the social responsibilities of organizations with respect to the introduction and use of technology have been consistently identified as important focal points for organizational theory and business practice. Managing the ethical and social implications of technological change is, in many ways, more straightforward than other aspects of technological change. Unlike issues associated with designing and developing technology, where the primary forces driving the process do not lend themselves to management control, issues associated with the social responsibility of organizations in managing the introduction and use of technology are generally viewed as being within the control of management and hence manageable. Social and ethical issues tend to come to the fore when an organization introduces new technology or changes to work settings, thereby disrupting social relationships. The primary concern of organizations is what burden they should assume in terms of cost and the length of time over which the adjustment should take place. (Volti & Croissant, 2024)

Organizations engage in considerable lobbying with respect to actions taken by government to regulate the introduction of technology and the conditions under which employees work with these technologies. It is generally acknowledged that when technology disrupts workers' lives, some sort of compensation should be offered. Organized labor is particularly sensitive in this regard, primarily because the introduction of technology has historically been associated with job losses and erosion of the ability to engage in collective bargaining. Management has argued that activities to improve work conditions actually increase the efficiency with which technology is used and ultimately benefit both the employee and the employer alike. At

the root of the problem are two primary issues: who pays the tab and what process is utilized to ensure a harmonious relationship between employees and the new technologies they have to work with. (Colli & Adriaensen, 2020)

10. Future Trends in Technological Change and Business Organizations

The discussion is limited to three major areas: the impacts upon individuals, groups, and business organizations. Recent research dealing with these impacts is summarized. This summary reflects the discussion in earlier sections and suggests future directions for research in these areas. With the discussion of current research as a basis, two innovative types of studies that promise new knowledge and insights into the issues raised in the review are described. (Donthu & Gustafsson, 2020)

Directions for studying the issues of organizational intervention are offered. For research in these three areas, it is hoped that it would be possible to generalize across different types of social settings. Principles of technological change, rather than a series of unrelated research studies, would form the end result. However, it is recognized that past research has realized few such payoffs and that in some critical respects, the study of business organization has narrowly drawn the boundaries of inquiry and has often depended on outdated theoretical frameworks, particularly in the application of classic organization theory. (McIntosh et al.2024)

11.conclusion

In conclusion, a number of key points can be drawn regarding the general issue of managing technological change in business organizations. First, despite the advent of manufacturing capability for many organizations, manufacturing output will continue to be organized on a large scale for the foreseeable future, being increasingly concentrated into larger economic units. The competitive and organizational structure of industrial sectors rests predominantly upon access to modern and capital-intensive technologies. Successful adaptation of organizations to their particular technological needs is not just desirable; it is often crucial to their survival and permanence.

Second, organizations utilize a variety of managerial structures in the effort to achieve effective adaptation to their needs. The choice of appropriate organizational mechanisms and spatial divisions, as well as the interaction between them, is a central concern. Our substantial concern, however, was to emphasize the importance of managerial functions at different levels in

the organization and the need to support these functional responsibilities with effective information systems. Relatively rigid rules and structures are used, enabling the organization to focus attention and manage its activities more flexibly elsewhere. It is through the exercise of broad managerial control and the ability of subordinate managers to use decision-making authority to respond to unexpected circumstances and to take advantage of specific expertise around them that the organization as a whole maintains the range of activities it has chosen to support.

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