Opportunities and Challenges of Enterprise Digital Transformation

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Abstract. "Change or die!" Is the title and opening concept of Alan Deutschman's article for Fast Company magazine. As the aphorism indicates, change is crucial if an enterprise wants to remain invincible in the market competition. Therefore, we investigate and study several academic sources relating to enterprise innovation. After analyzing different economic innovation models and the problems confronted by innovation, we believe that although enterprise innovation may bring a lot of setbacks, only through continuous innovation can enterprises keep the leading position in the competition. By perfecting the transformation of public data space, the successful application of digital service innovation (DSI) digital transformation technology has become an indispensable part of innovation. Enterprises will gradually be obsolete if they are not able to keep innovating. Innovation enables enterprises to adapt to new opportunities in the new era and have the adaptability to "adapt to all changes", so as to cope with the rapidly changing market. By studying various kinds of economic innovation literature and using charts and other methods, we summarized the advantages and methods of innovation in a more simple way, so that a more intuitive understanding of why enterprises should innovate today, how to innovate and the direction of innovation is provided.

Keywords: Innovate; benefits; complex.

1. Introduction

1.1 Background introduction

Many new technologies, including machine-to-machine communication and the Internet of things (IoTs), are brought into the public's awareness by the "Industrial Revolution 4.0" environment. With a new generation of industrial advanced technology like smart manufacturing, which combine virtual and physical reality, digital transformation is changing every aspect of how an organization runs, including adjustments made in tandem with earlier transformations like environmental and social transformations [1]. As a result of the high pace and unpredictable nature of many changes, complexity and dynamics are created, making effective forecasting and planning difficult or impossible. Due to the current business environment and competitive dynamics, businesses (especially those engaged in e-business) and their operations must be flexible and responsive, which entails being constantly driven by the need to innovate.

The divergence among the prevalent belief among digital economies entrepreneurs and the reality and requirements of the digital economies, however, is expanding as the demands of the new generation of digital technologies and the problems of digital transformation increase. These expectations include a state that is far more active in policy, risk-taking, operating the market, and managing the economy [2]. Digital transformation both fuels and is fueled by innovation. It is vital to realize that the legacy of prior organizational and management issues can be applied to the new ecosystems, instead of being an encumbrance, think of them as models that could be used to make distinctions [3]. The digital economy has similar challenges for new industries in terms of innovation and adaptability of new waves of technology, as well as absorption and dissemination of new digital technologies throughout the entire economy [2].

1.2 An overview of the progress of existing research and literature

The term "digital transformation" has gained popularity in our day and age, sparking the emergence of numerous academic disciplines and a huge number of studies. To understand the origins,

circumstances, and impacts of disruptive technologies, researchers examine how each technology is used or how digitalization changes that use [4].

A growing number of studies have been published in journals and conference proceedings. Researchers have identified the main research strands in a variety of important domains, including marketing, finance, and innovation management, with the aid of co-citation network analysis. It was shown that the main areas of study and research focus for digital transformation are related [4].

The publications in earlier research trend analyses were manually sorted according to the theories and methods employed, or according to the subjectivity of the researchers. The current study conducts network text analysis on papers that have recently been presented at conferences and published in scholarly journals to examine the trends of the research on digital transformation in order to shed some light on the service sector's future prospects for digital transformation [5]. There are also studies that analyze the possible methods to guide innovation in the digital transformation from a government perspective [2]; studies that research the method of improving business process management maturity models (BPM MMs); and studies that analyze small and medium-sized businesses' ongoing digital transformation processes, which have been accelerated by the fourth industrial revolution, in order to examine how they went through and discovered during the second and third industrial revolutions represents essential components that have shaped their way of operation and continue to promote innovation and transformation [3].

1.3 Motivation and framework of this article

Considering that the existing approaches are rather specialized and restricted to their domains, we aim to provide guidance and several suggesting solutions on how the industry should fulfill its goal of persistent innovation by producing a review based on existing research. Section 2 presents the focus of establishing a core innovation strategy. Section 3 identifies the changes that digital transformation caused on digital platforms, and possible combinations of digital transformation techniques, and puts forward absorptive capacity as a factor leading to innovation. The main research findings are outlined in the Conclusions section, which also explores the potential for further research. Section 4 selects an example innovation model to present its effects on an industry. Section 5 presents the limitations and future outlook of the research method used in section 4.

2. Related theories of enterprise innovation

2.1 Definition and characteristics of enterprise innovation

In the face of complex and changing market environment, enterprises must keep innovating to adapt to the new opportunities in the new era, produce sudden changes, and so to have the flexibility to cope with the rapid change of the market. To adapt to the emerging markets and business environment of the Internet age, it is arduous for companies to achieve transformation and development without innovation. Innovation is a process that involves a wide variety of sectors that work in the organization and it can be the improvement of the existing products and service performance or new kinds of one for new markets or developing an unprecedented market for current products [6].

Although the success of innovation brings huge benefits to enterprises, a small portion of them is able to do it because the complicated market environment leads to methods that are involved to implement. And the knowledge that distinguishes effective business innovation strategies from futile attempts is difficult to obtain in one team [7]. Therefore, innovation is very time-consuming and will result in the situation of rush, delay, and regression. The consequence of it is a low success rate of innovation, which is characteristic of enterprise innovation. Innovation should be initiated from the demand, there will be a lot of obstacles on the way to innovation, and perseverance and daring to struggle are indispensable for the success of the enterprise innovation.

2.2 The core strategy of enterprise innovation

The most important part of enterprise innovation is to establish the core 'innovation strategy'. The goal is to enhance the core innovation ability. Changing the strategic ideology is the first step. Modifying the extensive mode of economic growth, Improve the level of industrial technology, enhance the core innovation ability as the strategic basis for enterprise development. Amazon is a successful precedent for updating the core innovation ability as they updated their previous product to innovate: Amazon FBA program which incentivizes third-party sellers to sell online [8]. The implementation of core innovation strategy should grasp the general trend of economic development, take social and market demand as guidance, and take the scientific outlook on development as guidance. Integrating original innovation, and system integration innovation with an introduction, digestion, and absorption innovation so that to acquire more core intellectual property in key fields, and occupy a place in the scientific frontier and strategic high-tech fields. Making core innovation become the engine and motivator of the sustainable development of enterprise finance. Strengthening science and technology planning, construction of digital, applied science and technology research, promoting the research and application of new technology, new method, and new way of industry, completely transfer the economic growth mode to technological progress and staff quality improvement in order to promote the optimization of industrial strategy and realize the sustainable development of economy[9]; Through constructing innovation strategy, the enterprise can drive and promote its target, business, brand, and talent strategy, form a scientific strategic innovation system, eventually make the enterprise core innovation strategy more standardized, networked and systematic. Take Apple as an example. They create a WWDC congress which allows the practitioners to provide outside-of-the-box ideas so that innovative ideas are brought to the company from the platform which is a form of the innovation strategy of Apple [10].

2.3 Enterprise innovation model

There are many ways for enterprises to innovate, so there are different models corresponding to various forms of innovation, such as the combinatorial innovation model. This model first finds the smallest unit that needs to be studied in innovation by dismantling the elements and then re-examines the combination of the product, technology, market, customer, channel, marketing, and other aspects, so as to improve the innovation ability. For example, the field of aerial UAV, can be divided into UAV and camera for separate research to improve the endurance and stability of UAV, as well as the tracking mode and clarity of the camera, so as to realize innovation [11].

3. The effect of digital transformation on enterprise innovation

The new and developing form of digital economies are sure to be confronted with challenges, in order to form a solution, possible combinations of digital transformation techniques and the crucial factor, absorptive capacity, are put forward below to support innovation.

3.1 Transforming into public data spaces

Information and communication technology have enabled data interchange more rapid than ever since the internet was created 25 years ago, opening up new opportunities for organizational barriers to be broken through corporate innovation. Public data spaces differ significantly from private digital platforms in that they involve more third parties, have wider network effects, and necessitate the enactment of data protection legislation. A single company finds it difficult to adapt to a dynamic platform environment, which makes it difficult to address complex societal issues, properly divide earnings, involve physically connected digital things, and develop governance structures [12]. Modern digital solutions from the ecosystem and the organization are likely to have an impact on the company. The capacity to control this dynamic relationship makes it harder to manage digital findings in an efficient manner.

3.2 Possible combinations of digital transformation techniques that produce successful digital service innovation (DSI)

Digital technologies have been used to transition from product-centric to service-centric business models, in order to form a digital transformation strategy. Researchers employ full-set Qualitative Comparative Analysis on a set of 17 case studies of digital transformation strategies from legitimate companies with a range of industrial backgrounds [13]. Innovation in digital services is described as "the creation of new or developing current processes and resources, or through integrating practices and resources in novel ways to offer new value propositions." The necessary condition results indicate that centralizing judgment is the only requirement for a successful DSI. The designs suggest that a company's innovation activities are negatively impacted by the danger of digital disruption. Additionally, researchers find that while competitive organizations may rely on automatic methods, corporations that are immediately threatened by digital disruption can benefit from strategic alliances. According to the patterns of the research findings, failure can occur when strategic outsourcing is not used. One strategy for success includes strategic outsourcing. However, rather than relying on outsourcing, small and medium-sized firms should work to construct a robust ecosystem of association members that offer the necessary competencies [13].

3.3 Considering absorptive capacity as a mediating role that contributes to innovation

The study's findings demonstrate how absorptive capacity, and to a lesser extent of digital capacity, contribute significantly and directly to the performance of innovation [14]. Businesses must develop their digital capacity, which includes measures to integrate fully and actively employ digital technology, in order to realize their aim of digital transformation. While absorptive capacity is often based on the amount of information currently available and the amount of effort being made to enhance technical capabilities, digital capacity is typically related to two dimensions: a supply-side one and a demand-side one. Innovation success depends on a firm's own knowledge base as well as its original capacity to integrate the usage of digital technologies for the generation of new value as innovation is not always the outcome of the adoption of digital technology alone [14].

4. Model of the innovation

Fig.1. the graph of Circle of change, The Circle of Change is a system model that depicts the foundations of the innovation economy as a collection of dynamic processes that work together to strengthen one another.

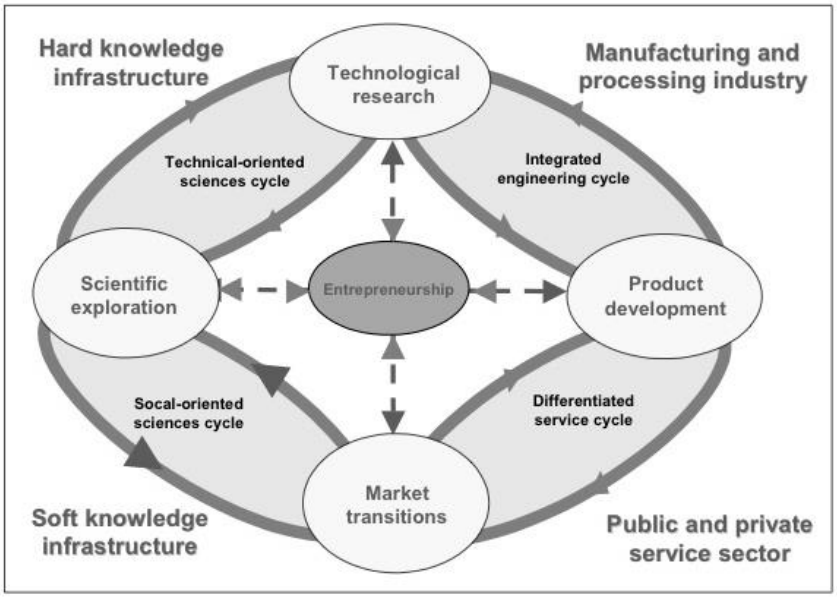

Figure 1. The graph of Circle of change [15]

4.1 Improvements based on conventional models

The Cyclic Innovation Model, which was created in the 1990s as a tool for ongoing reform of research and industry, is suggested as a fourth-generation innovation model.

In contrast to the conventional CIM approaches, this paradigm integrates engineering, commercialization, and hard and soft sciences into a unified system of creative processes. It also demonstrates the necessity of adding feedback routes to models in order to explicitly represent adaptive steering and learning processes.

4.2 A key characteristic of fourth-generation innovation models

Innovation models are divided into generations in the literature on innovation. However, well-defined models have not yet made it into the open literature despite discussions about the requirements for next-generation concepts. The innovation regime is described by a "circle of change" in this model, which is a fourth-generation innovation model. It ties together changes in markets, technological advancements, product design, and manufacturing. The model substitutes a circle with four "nodes of change" connected by four interlocking "cycles of change" for the conventional chain concept. When taken as a whole, they can be viewed as an area of opportunity where traditional boundaries are crossed by processes. These procedures are typical of open innovation today and are cyclical in nature. Knowledge, information, capital, labor, goods, and services, as well as technological and socioeconomic values, are all constantly traded in the circle. The role of entrepreneurship is crucial: Innovation is nonexistent without entrepreneurship.

4.3 Linked cycle system

Fig. 1 first distinctive feature is that architecture is circular rather than a string: Value creation is a continuous process since ideas generate new advances, successes generate new problems, and failures provide fresh concepts. To keep the circle's momentum, new macroeconomic mechanisms are required. The faith in the innovation economy is being eroded by massive failures like the recent dotcom disaster, which is also making venture money scarce. The change processes with reference to CIM are separated. Businesses are focusing on doing more of the same at a slower pace as the economy enters a phase of stagnation. where businesses are focusing on doing more of the same things at lower costs until confidence and private equity become available again to drive innovation. The circle's momentum is increasing once more. where businesses are focusing on doing more of the same things at lower costs until confidence and private equity become available again to drive innovation. The circle's momentum is increasing once more.

4.4 Dynamic processes in a system - Circle of Change

The proposed model's description of a system of processes that change—the circle of change, comprising four processes: market transitions, product development, scientific inquiry, and technological exploration—is also shown in Figure 1. However, more crucially, there are "cycles of change" between these nodes that guarantee that dynamic processes in the nodes influence one another. As a result, connected cycles is created, which in influences other connected cycles (higher-order dependencies). This enables a more or less connected web between industry and technology, encouraging creative engagement. This results in a system of interconnected cycles that have an impact on one another (higher-order dependencies). The end result is a regime of interconnected dynamic processes that are more or less coordinated and encourage creative collaboration among advancements in science (on the left) and industry (on the right), as well as advancements in technology (on the top) and the market (bottom). Few barriers will exist between nodes and cycles in an innovation economy that is successful because institutions and organizational structures support the change processes [16]. There is a constant exchange of knowledge, information, capital, labor, goods, services, and socioeconomic as well as technical values throughout the circle.

5. Limitations & Future outlooks

5.1 Current situation

Digital transformation is a fundamental change process that is made possible by making smart use of crucial capabilities and resources and innovative use of digital innovations. This is one of the most common problems that all businesses face today. despite the fact that this subject has been investigated in a variety of settings and that numerous papers offer in-depth viewpoints on it. There are still a lot of unanswered questions about how various industries implement digital transformation, what drives businesses to move from using basic information technology to digital transformation, and the connection between these issues.

A significant limitation is that the networks connecting multi-partnerships that can start quickly, change quickly, and learn quickly are required for the "nodes of change. “This indicates that in the current innovation landscape, the issue will not be "who is accessible," but rather "who is needed”. This implies, among other things, that the current system of a labor organization has to be reviewed: innovation's social component In fact, the proposed model alerts decision-makers to the need to redesign institutional elements like governmental regulations regarding the movement of capital, labor, and knowledge around the innovation circle in order to better support the innovation processes. The current structures of government need to be rethought in light of this.

5.2 Future outlook

Future innovations will frequently be the outcome of fusing customer demands from various industries with technical capabilities. Models of innovation from the fourth generation should be able to demonstrate that [15]. In terms of CIM: takes into consideration the advancements that will be possible in the healthcare sector as a result of recent developments in the IC sector.

countermeasure—turning scientific knowledge into socioeconomic value

The proposed model's key implication is that, in order to transform scientific knowledge into socioeconomic value, Innovation in all industries necessitates early interactions between new business ideas and scientific discoveries, as well as new technological inventions and market opportunities. These cyclical linkages will transcend not just traditional sectoral borders but also those separating various stages of innovation. It is intended to imply that all nodes of the proposed innovation model are dynamic at every stage of the innovation track by eliminating the pipeline idea from models of innovation. The sluggish and expensive internal pipeline model is slowly being taken place by a more flexible idea that calls for "playing chess at four levels at once”. The distant distance among technology and markets is greatly reduced, there are little connections between new information and prompt adopters, and new innovations construct on previous ones as a result of this utilization of knowledge from other industrial sectors.

6. Conclusion

In conclusion, digital innovation transformation has formed an irresistible trend for enterprises in modern society. Perfecting the transformation to public data space and successfully using the digital transformation technology of Digital Service innovation (DSI) has become an indispensable part of innovation. Similarly, having a good absorptive capacity can directly promote digital innovation. On this basis, the fourth-generation innovation model and the company's own positioning to properly use the innovation cycle model can be conflated, giving play to the effect of the linkage cycle, updating the innovation model, and forming a good innovation cycle. Although the research on enterprise innovation in the western era is not in-depth, it basically summarizes the current forms of innovation, which has certain reference and foresight.

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