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Analysis of Information Technology and Business Model Alignment

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Abstract: The business community has witnessed significant paradigm shifts since the industrial era with the emergence of technology transforming simple ideas into radical changes. However, the new model excludes both merits and limitations as firms that have failed to align their business strategies and infrastructures with technological advancements tend to struggle. The paper discusses the contribution of IT/Business Models alignment by evaluating the effect of innovation, performance, organization culture, and ability to transform a simple idea. The paper also provides real-life examples of the multinational firms that have benefited from a strong alignment such as Volkswagen's ability to internalize the Indian market.

Keywords: Business model; Information technology; Innovation; Organizational structure

I. INTRODUCTION

Information and technology systems are essential in efficient service delivery. Systems such as computers, radio waves, television, and mobile phones are some of the devices that a company can use to enhance their service delivery. The choice of a given information technology system should be able to meet the vision, mission and the core values of a given institution. Therefore, the management assumes the critical role of ensuring that the technology that a firm adopts is suitable to the business model of the company. Insensitivity to technological models may delay the achievement of strategic business goals, thereby, resulting in stagnation. It is, therefore, essential that every component of the business model be aligned with the latest information technology systems, as evident in the subsequent sections of this research paper. The evolution of information and technology models has generated several paradigm shifts in business management. Organizations that are not able to maintain the pace of evolution in information and technology are likely to render substandard services to their clients. Eventually, the inability to satisfy the needs of the clients causes a vicious cycle of failures, which, ultimately, can lead to the liquidity of the business organization. Thus, it is paramount that an institution employs the best technology to improve service delivery. Additionally, the use of apt technology is important in maintaining consumer loyalty and withstanding competition from the ever-evolving business environment. Use of appropriate technology is also important in maintaining the comfort of the members of staff as they render their services to a given institution. In the 1970s, business communities witnessed significant transformation due to advancement in technological concepts bringing about new opportunities and challenges. Successful ventures were able to harness the new capabilities that technology created such as globalization, enhancing international commerce, and internal competencies [1]. The relationship between Business Models (BM) and Information Communication Technology (ICT) has developed significantly, which leads to sustainable competitive advantages for the business. Precisely, the ability of a company to align the two elements that relate to Business Models and Information Technology influence the level of innovation, positive transformation, and performance. A business model refers to a deliberate system that an entity institutes with an objective to identify the critical stakeholders and the cadre of relationship that will be the most economically advantageous in long-term. Business models also often portray the cause and effect relationship of the decision, policies, and strategies that a venture formulates. For instance, a decision to outsource will have significant effects toward the overall business competencies such as the ability to concentrate on core activities. Consequently, outsourcing can have negative repercussion by demoralizing employees who risk job cut due to the decision to import services from the off-shore entity in China. Therefore, the use of Information Technology helps to harness the business' mission, vision, strategies, tactics, and objectives statements by creating a competitive fit in all three organizational levels. The level of strategic fit and functional integration provide for a business to enhance

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innovation, performance, and organizational culture. Equally, an entity can embrace digital transformation and management style as sustainable internal competencies thus provide an opportunity to evaluate the effectiveness of cadre of alignment between Information Technology and Business Process. The analysis involves explaining the issues concerning the level of innovation, performance, culture, management efficiencies, and digital transformation among selected multinational entities. The study will address three primary objectives. First, the analysis will attempt to identify the rationale for the alignment of business models with information technology. Second, it will evaluate the methods of Information Technology and business model alignment. Third, it will establish the issues involved while aligning the business model and information technology.

II. LITERATURE REVIEW

Information technology is increasingly becoming an important pillar in the establishment of a business model. It is, essentially, the main link between the clients and the organization. The method of presentation of information to clients will determine the response of the customers to the products of a given organization. In trading firms, the presentation of information will ultimately affect the demand, which, in turn, will affect the mode of transport that an organization chooses to use to reach its customers. Unfortunately, a large number of Small and Medium Sized Enterprises do not know how to align their organization's motto, mission, and vision and core values with the prevailing information technology [2]. Some entrepreneurs have rushed into purchasing systems that increase the complexity of the business model without improving the return per investment. It is such decisions that make many investors accrue losses that could have otherwise been prevented given strategic planning and more careful choice of technology.

Traditional managers have a resistance to change, especially in employing up-to-date technology. Particularly, old people who are unwilling to respond to technological advancement are still managing more than 40% of the businesses in the developing world. This phenomenon leads to marked failure of the institution. Between 2013 and 2015 alone, over 300 business consultancy firms were registered in Saudi Arabia. Majority of the enlisted consultancy firms were offering leadership training to industries and emancipation on the alignment of the business model to technology. It is important to ensure that the operations, organizational structure, trading practices and business policies are commensurate with the best technology within the business environment.

2.1 Effect of IT and Business Model Toward Innovation

The ability to respond promptly to changes within a business environment is the thin line that separate successful companies from other ventures. Technology is an environmental parameter that influences the ability of an entity to gain competitive advantages [3]. Therefore, technological advancement provides an opportunity to improve the level of efficiency when aligned to the existing corporate strategies. The technological potential is a dominant alignment perspective that facilitates functional integration between the Information Technology Strategies and the user's Vision, Mission, Objectives, Strategies, as well as Tactical statements (VMOST) [4]. Innovation enables an organization to gain competitive advantages by embracing corporate changes such as the use of 'top-bottom' approach in implementing business strategies. Besides, change facilitates strategic fit with an organization in two manners. Change from technological potential perspective of IT and business model alignment creates a definite link between the overall performance and internal competencies [4]. Several management theories and concepts have been built from the standpoint that technological innovation is a sustainable source of competitive advantage with the corporate sector. Business leaders strive to spur innovation among their employees by reward creativity and regular training. The research and development model within an organization provides a strategic fit because it aims to bolster innovation in product design and service delivery. Further, technological innovation enhances functional integration because it ensures that the current business system, technologies, and people align effectively through adequate collaboration [5]. The 'top-bottom' approach allows the research and development department to collaborate with other functional departments in value creation by proposing innovative designs that can bolster the current performance level. The second manner in which technological innovation relates to enhancing the openness and user engagement experiences using the existing business models. The fundamental aim of a business model is to define the cause and effect relationship within an organization [3]. Therefore, the strategic fit between the corporate vision, mission, objectives, and tactical statement in line with the current Information Technology strategy bolsters the efficiency in liaising with various stakeholders. External stakeholders, for instance, places a monetary value and qualitative values toward an entity depending on the level of innovation. A firm such as Apple.com developed adequate customer loyalty because it was able to demonstrate its capabilities in innovation. Under the stewardship of the late Steve Job, Apple.com capitalized on the appropriate strategic fit between IT and Business growth strategies to create a positive reputation.

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The success of the Apple.com manifests the merit of adequate strategic fit between business model and IT because it improves the users' experiences and openness through innovative products. Business adaptation also portrays the benefit of achieving innovation due to the adequate alignment of both the business and Information Technology infrastructures. The globalization phenomenon facilitates international commerce, which further creates an opportunity for the business fraternity to gain competitive advantages over the local rivals [1]. However, to capitalize on the new capabilities brought about by globalization depends on the degree and success of the IT and Business model alignment. Successful alignment aims to create efficiency in all the three management levels of an organization that regards to operational, tactical, and strategic parameters. Therefore, the Information Technology infrastructure and business models considered as efficient within the local market parameter may struggle to accord such an entity with a substantial competitive advantage when subjected to international level [6]. Multinational corporations that aim to invest in the lucrative emerging markets of Africa, Asia, and Latin America ought to evaluate their tactical and strategic capability critically due to potential misalignment with new environments. Technological innovation enables such multinationals to modify and optimize the existing infrastructures to fit with the particular context in the international commerce. The success of the German Volkswagen Motor Corporation in India illustrates how technological alignment allowed the entity to internalize the new market and generate substantial market share. Innovation facilitates the adaptation to new environmental contexts by providing competency within the internal and external domain [6]. The internal domain includes the capability to enhance local consolidation, expansion, and emergency that provides different emphases within the business models. The internal domain aims to create an adequate functional integration between the business and Information Technology infrastructural models by establishing competency within the domestic market environment. Conversely, the external domain seeks to provide a sustainable strategic fit because it adapts the local skills toward the international business contexts [6]. The global extension was the key factor that boosted Volkswagen's competitiveness in India despite various impediments faced such as protectionism policies by the local government. Importantly, the variation in the degree to which a multinational corporation modifies the four components of innovation influences the overall performance of the domestic and international market segments.

2.2 Business Models and IT Alignment in Enhancing Performance

A business entity exists to provide a solution to its immediate stakeholders such as a customer by transforming the existing natural resources as a raw material so that it creates a utility factor. The ability to convert raw materials into finished good or provide services to their clients requires adequate measures to coordinate, organize, and plan on how the venture will attain its core objectives [5]. The advancement of technology and design of strategic business models provide such an entity with relevant competency to perform efficiently. Several measures help to quantify and qualify the perceived adequate performance. The strategic fit and functional integration provide such measure necessary to qualify the nature of performance. Business models as strategic designs and patterns that facilitate the transformation of raw materials and service delivery in timely and cost-effective manner exist in two distinctive forms. The interactive business model refers to a corporate parameter that creates new business opportunity for an organization [6]. The interactive business models are essential because they allow a multinational corporation to enhance its performance when targeting low-income consumers. The business parameter helps the company to integrate, leverage, and combine its inherent resource to the ecosystem. The three capabilities of integrating, capitalizing, and combining internal resources to the external competencies strengthen the firm's strategic fits and functional integration due to the subsequent alignment of the business infrastructures to the Information Technology. Similarly, the four strategic alignment perspectives that help to quantify and qualify the performance efficiency of a multinational entity relate to competitive potential, technological capability, and strategy execution. The attainable service level is another paradigm used to indicate the degree of performance that a competitive venture has attained after aligning its corporate and IT infrastructures [6]. The potential competitive viewpoint considers adequate performance depending on the ability of the firm to align its corporate strategies with new technology. Therefore, the paradigm perceives a sustainable competitive advantage as the capacity to utilize technology to re-engineer the existing organizational structures in all the three levels. The Knowledge Management System (KMS) that firm implements in its operational level are as useful as the quality of the strategic decisions that the chief executive officer can formulate. Rapid prototyping is a fundamental technique that provides a competitive multinational entity with the ability to test the reliability of new technologies within it business environment. The strategic execution perspective boosts the firm's strategic fit and functional integration because it improves the performance within the three organizational levels depending on how an entity can respond promptly to environmental changes. A successful business entity places key emphasis on strategic management because it offers long-term and immediate solutions to impending issues such as the threat from remote

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environmental factors [1]. Therefore, the Information Technology strategies and infrastructures need to have both the short-term and long-term view during the design phase. Equally, a firm should take similar measures when developing its corporate strategies and infrastructures to improve overall performance. The Strategic Alignment Model is a fundamental approach that the Information and Communication Technology managers adapt to review the efficiency concerning the degree of aligning IT and Business models. The service level perspective portrays efficient performance by using a 'top-bottom' criterion to ascertain the alignment of technology and business strategies. A successful manager embraces technology as a means to support his ability to implement, design, or review the current cadres of corporate policies [4]. A 'top-bottom' approach implies that a manager exerts absolute power in determining the influence of technological concepts. Technology has an aim to support his or her typical performance rather than to change the business strategies. Therefore, automation provides both merits and challenges according to the service level paradigm [3]. Technology can allow a venture to transform its customer service capability by facilitating collaboration between the Customer Desk and a client. However, auto-generated service messages can be ineffective because there is a potential to create negative perceptions from consumers about the entity's commitments to resolve the former's concerns. The service level perspective considers efficiency as the ability to trade-off the merits and limitation of technology. Precisely, active alignment of technology and business model should aim to trigger creativity among employees by providing an alternative way of accomplishing tasks.

2.3 Improved Organization Culture

Successful firms have effective transition and succession plan designed to cushion against the future uncertainties. The emergence of technology has played a key role in influencing business models by providing an alternative way of doing things [6]. A corporate culture refers to the shared norms, assumptions, and way of doing business within the organization. An essential feature of a culture is the need to pass and introduce such norms and assumptions from one generation to another. The attribute provides an organizational culture with a long-term implication thus business leaders have a trustee obligation to cultivate only the appropriate cultures [5]. Innovation is a modern cultural element that successful multinational entities like Apple.com have committed to promoting with an aim to safeguard its future as an on-going concern. The industrial revolution created a notion that people would physically seek out for the services that they required. For instance, if a patient felt sick, he or she would have to visit the nearest health institution. On the contrary, technology has brought out significant cultural shifts in which organizations have to look for the people for them to maximize their revenue [5]. Technology, globalization, innovation, and international commerce have been key factors that propel the cultural shift. Business models built using the industrial revolution paradigm that laid emphasis on the selling concepts would have to realign such philosophy with the new marketing parameter. The marketing concept stipulates that an organization achieve its objectives by undertaking a careful research to identify the need for the target market and delivering such products to the consumers. The Internet economy creates a new environment that reverses the traditional value creation model by emphasizing on the downstream activities and competencies. A business changes and transformations are inevitable as creativity leads to the invention of transformative skills across the globe. The industrial era business model failed to incorporate and consider the possibility of virtual payment, as contemporary ventures have to take such consideration [6]. The popularity of Bit coin currently poses a significant threat to the reliance on the paper money that portrays the new currencies as the future legal tendency. The transformation requires adequate preparations by making business model flexible to allow future modifications to conform to future alterations.

2.4 Business Transformation

The change in organizational cultures and structures require effective approaches to afford the ventures return for the capital invested. The Strategic Alignment Model (SAM), Business Rule Group (BRG) model, and Model Driven Architecture (MDA) are sustainable paradigms that facilitate business to create adequate interlinkages necessary to attain a strategic fit and functional integration [4]. The Strategic Alignment Model describes the wider landscape that facilitates a business to modify the organizational, technological, internal, and external perspectives for sustainable competitive advantages. The Model Driven Architecture is a functional-based approach that aligns the corporate culture and structural infrastructures to technology-driven initiatives. Often, a business idea has several distinctive lifecycle phases. The four steps relate to introduction, growth, maturity, and decline stages that necessitate adequate approaches to prolong the merits and safeguard against the harmful environmental factors. At the initial stage, a business should strive to align its strategies with new technologies that will allow the firm penetrates into the new market. The Uber concept is a successful idea that was able to align its objective with the technology that would help transform the

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transportation industry [5]. Adequate alignment of the business strategy and IT changes the introductory stage by making the new venture a major disrupter within the sector. Equally, successful alignment transforms the growth stage by making the new firm competitive than the rivals. The sharing economy is a transformative business model that allows the entrepreneur to bolster the growth of their ventures without having to purchase high capital goods. The Uber Venture, for instance, lacks the fleet of cars unlike the traditional taxis system, but rents vehicles belonging to their contracted drivers. Other technological concepts provide for revenue models where entrepreneurs can generate more incomes. New business ideas become industry disrupters and make abnormal profits at their infancy level, which reveals the merits of aligning technology with transactional and revenue models.

Ultimately, a business idea has a maturity stage characterized by shrinked and stagnant revenues. However, successful ventures have been able to optimize their processes by capitalizing on the various relationships and contacts to trigger new sales. Information Technology infrastructures provide seamless coordination with internal and external stakeholders by using the available communication channels [3]. For instance, the Just-in-Time production concept enables a firm that engages in distribution to save on warehousing cost due to minimal or no inventory held within the storage facilities. The saving attained helps to facilitate the marketing and research functions, which provides a business with an opportunity to extend its lifespan. Concisely, technology and business models have a close relationship that allows a venture to gain sustainable competitive advantage. Successful multinationals like Uber, Apple.Inc, and Volkswagen illustrate the potential of effective alignment between the firm's business models and technology. Enhancing innovation, performance, culture, and transforming simple ideas into an industry disrupter are a few capabilities that successful entities have been able to leverage on by aligning the IT infrastructures to their tactical, vision, and strategic statements. Contemporary entrepreneurs should take adequate consideration of the potential effects of adopting technology toward the ability of their ventures to perform its mandates to various stakeholders.

III. DATA DESCRIPTION

The study relied on empirical data from two companies that have aligned (or are in the process of aligning) their information systems with their business models. In particular, the selected firms were Shell Global and Western Union. The rationale for selecting the companies was to get a comprehensive view of information systems and business model alignment across different industries. For each firm, the study reviewed the existing information systems in place, and the manner in which it reflects the company's business model. Based on the information obtained, Shell Global and Western Union exhibit uniquely different business models as shown in Table 1. The rationale for this difference is because Western Union deals with product and service offerings that vary from those offered by Shell Global. To this end, the three firms utilize the respective combination of information technology and business models in their brick and mortar contexts. For Shell Global, consumers may opt to make their purchases by visiting the respective franchises near them. It is through the transactions at these branches that the role of information systems comes into play. For the most part, the product offerings that consumer find in respective brick-and-mortar stores as similar across all branches. On the other hand, Western Union's model might allow consumers to transact entirely via the Internet.

Firm	Business Model
Shell	Franchise model
Western Union	Freemium model

Table 1: Business models used by the three firms.

IV. RESULTS

The results indicate three main areas of business for Shell Global, including gas and power, upstream exploration, and downstream refining or refining. Nonetheless, the management of major projects and technology development are similar across these business areas. It follows that the company's growth, efficiency, and performance are dependent on the versatile information systems and team of technicians. For instance, the company's performance in 2016 was shaky

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following the volatility in oil prices. However, the application of robust IT systems –multiple ERP systems- ensured the company's stock performance outdid its moving averages despite falling slightly, as shown in Figure 1 below.

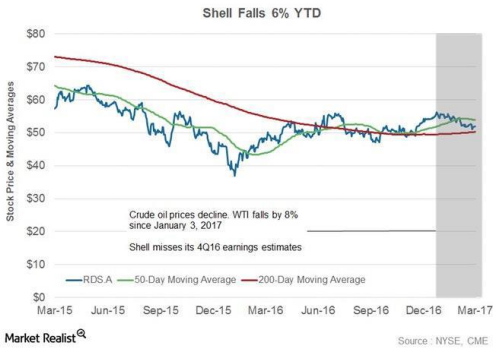

Figure 1: Shell's performance.

In this way, IT is an essential aspect of Shell's operations. Moreover, the company also exhibits state-of-the-art software that propels the production and exploration successes. Each of the company's franchises utilizes unique set of Enterprise Resource Planning (ERP) systems suited for respective operations. Nonetheless, the centralized functions utilize global applications that cut across the entire value chain of the company. To this end, the solutions to the majority of Shell's problems are dependent on the belief in technology and the engineering culture ("Information Technology"). Nonetheless, the bias towards strategic thinking and distributed power continues to inhibit the firm's commitment to align crucial information systems to its business model [7] observed this bias in the Business Application Management (BAM) utilized across all the company's global functions. As such, there is a need to improve and implement comprehensive governance over the company's information system [7] (Figure 2).

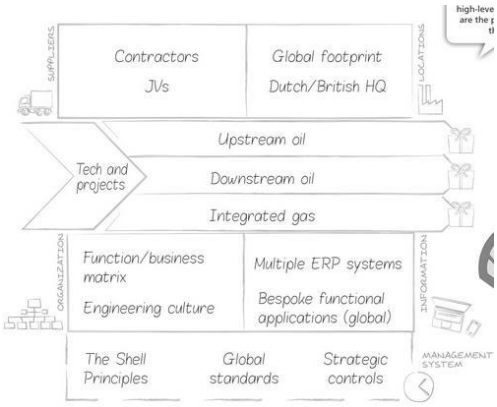

Figure 2: Shell's operating model.

As a whole, Shell Global has instituted drastic measures of gas and petroleum exploration and manufacturing. These measures are in line with the business model, which require the company to not only meet its Shell Principles and Strategic Controls, but also meet the global standards in aspects such as the improvement of corporate social responsibility through environmental conservation projects [8]. To this end, the company's primary activities spread across six different functions along its supply chain as shown in Figure 3. Acquiring technology that could assist in tapping the gas and accomplish other functions appears to be the practical measure of aligning the information technology of the energy company to its business model. The inclusion of the renewable energy is also instrumental in ensuring that the companies achieve their desired business goals [7].

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Figure 3: Main activities in shell's business model.

Most notably, Western Union Money Transfer service is experiencing stiff competition from related companies like MoneyGram and PayPal that offer similar services [9]. The method of money transfer offered by Western Union has been dependent on traditional methods of cash remittance leading poor performance in the market. Once the company recognized its main weakness - dependence on out-dated technology - it has started research on improving the measures of money transfer. Relying on coded numbers from the sender and the receiver of the cash is time consuming compared to the use of electronic money transfers as established by such companies as PayPal [9]. Nonetheless, Western Union's efforts to align its information systems to its business model have been futile at times owing to the obsolescence of some of its products such as Telegraph. At times, the severity of such business outcomes is adverse to the extent of rendering some of its strategic responses inadequate and inappropriate [10]. The latest investment in research and computer trial and sponsorships by Western Union is a perfect attempt to align the business model of the company the current information and technology systems as shown in Figure 4.

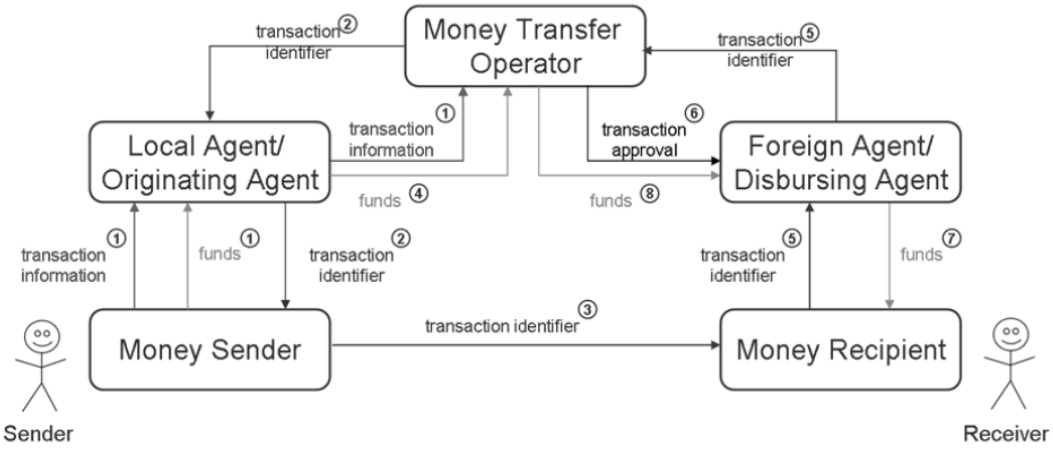

Figure 4: Western union's payment systems.

V. DISCUSSION

5.1 Rationale Behind the Alignment of Business Models with Information Technology

In practice, there is a fundamental linkage between information systems and business models [11], the alignment of business models with information technology fosters the development of established and focused processes, which creates an understanding between and IT units. As such, IT becomes a critical aspect of the firm. The investment

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potential for IT increases when the firm views it as a cost center. In consequence, business managers begin to increase the business and technical skills [11]. Perhaps the case of Shell Global can shed some light concerning this motivation. As mentioned earlier, the company sought to integrate information technology with the majority of its supply chain aspects including the exploration of crude oil, price modelling, and demand planning to mention a few. For Western Union, the rationale for the alignment of their business model and information systems is to achieve its money transfer processes. Another rationale for this alignment is to improve the managed processes. Under the improvement of managed processes, the alignment allows IT to become a value asset during decision support. In this way, organizations are able to view IT as an enabler of changes and as a value service. It follows that these technologies become an effective way that allow firms to gain their competitive advantage [11]. For instance, the obsolescence of some of Western Union's services shows the extent of this significance. Perhaps the company would still be at par with its rivals if it had bolstered its services to meet or exceed the industry requirements [11]. Observe that another rationale for the alignment between business models and information technology is to achieve optimized processes. In this way, the respective firms attempt to implement their IT-business strategies across the entire firm. It follows that the implementation of such technologies allows the company to leverage on its customers and partners. External entities including suppliers, partners, and customers are able to receive metrics and knowledge shared by the firm via the respective technologies. Therefore, the value chain's suppliers and external customers become part of the extended business activities through IT [11]. For instance, Shell's use of multiple ERP technologies in different business functions allows it to interact with other parties across its supply chain.

5.2 Methods of Information Technology and Business Model Alignment.

Product trial is important in employing a given technology in a business. For instance, bulk purchase of a system that may be having potential risks to the business model is not a wise move. Small amounts of a given technology should be employed since this increases the confidence that the members of staff have on the technology. Also, the use of staged introduction of a commodity to a business is important in educating the members of staff on how to embrace and use a given device. Furthermore, continuous employee education through seminars is important in enabling them to know the business structure and the available technological options. Employee education can be achieved through seminars, conferences or any other forum that is suitable for adult education. Through such forums, the resistance that employees have to change can be surmounted. Quite significantly, benchmarking is an important tool of knowing the developments in a given business environment. Businesses with similar models can be studied to find ways of embracing technological changes. Through benchmarking, it is possible to access the viability of a given technological change before implementing it in a given industry. Besides, benchmarking enables a firm to learn the steps, challenges, costs and the strengths and weaknesses involved with a given change process [12]. Through this strategy, an institution can compare and contrast the available technological avenues in a given market and realign itself appropriately.

5.3 Issues Involved while Aligning the Business Model and Information Technology

Information Technology systems are expensive and require heavy financial investment. In some cases, the alignment may not result in instant increase in income per invested capital [13-20]. These alignments may precipitate financial losses by the company, especially when poor project planning is involved. Resistance to change by employees is another challenge that technological alignments face [14]. Some employees are not willing to learn new methods of performing certain activities, and this may lead to conflicts with far-reaching consequences for the company. Fear of the unknown and unexplained anxiety while adopting new methods of operation in a given industry are key factors that lead to the development of resistance to change [15]. Poor leadership strategies can also hinder the adoption of the best technology for the operations in a given institution [19]. For instance, it appears that challenges facing the alignment of Shell's business model to its information technology largely emanate from the bias towards strategic thinking and distributed power. Further, competition in the age of increasing information technologies results in a new set of constraints for companies. In this way, it becomes difficult to align the respective business models to the information technology [20]. This issue is apparent through the obsolescence of some aspects of Western Union's business model product and service offerings such as Telegraph.

VI. CONCLUSION

It is important to align the business model of any company to the latest information technology in the business environment. In the era of internet and online marketing and communication, it is crucial to choose the most appropriate method of communication with employees, suppliers, shareholders and clients and other parties that have

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interest in a given entity [16]. Proper alignment of the business model to the information and technology is a critical step of ensuring that the employees and clients are aware of the undertaking of the business; making this the first step of ensuring consumer loyalty [17]. The mission, vision, core values, operation and other aspects of any business should be realistic and enable technological advancement. Evaluation of the information technology systems of an institution to gain relevance to a given environment cannot be underestimated as it influences the direction that the future of a given business entity would take [18].

VII. RECOMMENDATIONS

In light of the insights addressed in this paper, the researcher recommends that companies increase their attention on the alignment between their business models and the respective information systems since these technologies are becoming more essential for the success of business strategies. A business organization that desires to succeed amidst competition triggered by the technological advancement in any environment should ensure that every aspect of the business model is working together with the latest technology. This initiative is achievable through careful benchmarking strategies that will reduce the risks that are involved while implementing a given change process in an institution. Importantly, future studies should attempt to incorporate other business models apart from the franchise and freemium categories to assess the extent of their alignment with information technologies and the potential implications. As a whole, managers from the respective business units and the IT function should continue to work together for the success of the organization.

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