Chapter

Digital Transformation: Digital Leadership Role in Developing Business Model Innovation Mediated by Co-Creation Strategy for Telecommunication Incumbent Firms

Leonardus Wahyu Wasono Mihardjo and Sasmoko Sasmoko

Abstract

Incumbents have a challenge to sustain their business due to new attractive business model offered by new entrants. Incumbent firms are required to transform their existing business to a new paradigm of business which is digital business through developing new capability in business model. In developing innovation in the business model, there is a challenge for incumbents due to existing legacy business and routine process. The fastest way in developing new capabilities through collaboration is called co-creation strategy. In driving co-creation strong culture and visioning of digital leader is required. The study of the digital leadership role in developing business model innovation and co-creation strategy was limited; hence this study has an objective to assess the role of digital leadership, whether it will direct or indirect through co-creation strategy in developing business model innovation. The study was conducted on 88 senior leader respondents. The statistical data analysis used SmartPLS application. The result explained that digital leadership impacts indirectly through co-creation strategy on developing business model innovation. Co-creation strategy plays a mediating role in the relationship between business model innovation and digital leadership.

Keywords: digital transformation, digital leadership, co-creation strategy, business model innovation

1. Introduction

The impact of digital technology through the Internet and cloud brings the new paradigm in terms of structure in all industries. The Internet creates a borderless economy and new whole mind and results in the information era changes into the conceptual age era [1]. The change is not only in the customer but also in the market; the incumbent has to transform their process to be more fast, simple, and effective and has an ability to personalize their products by digitizing and providing the process learning [2]. Digital technology creates a certain paradox between

the opportunity and efficiency. In terms of opportunity, it will generate revenue through innovation in business model and in terms of efficiency will be created through digitization process [3]. In the digital era, there are four factors in the driving of change that are key success factors of the firms which are innovation, collaboration, integration, and interoperability [4, 5].

New entries come into the market with an attractive business model, while the incumbent firms still rely on the existing business model based on their existing assets that may not be able to fulfill customer and market needs. Hence, incumbent firms are required to develop new capabilities within their business model to anticipate the changes in customers and market. Co-creation is defined as joins co-values between the firms and partners in order to produce a mutually valued outcome and fastest way in developing business model capability. Co-creation will also accelerate and enable incumbent firms to transform the business to be able to be more innovative, standardized, modular, interoperable, decentralized, and service oriented [6]. The more innovative the firms are, the more value the co-creation model can bring. The need for co-creation is for the development of business model innovations since the combination of strong capabilities between firms and partners to provide a complete supply chain could create valuable business model innovations [7, 8]. A strong business model innovation would bring sustainability with a combination of focus on customers and could create sustainable competitiveness for incumbent firms in the disruptive era [9]. Telecommunication is the main sector where the incumbent firms are significantly disrupted by new entries [10]. Meanwhile, the telecommunication industry in Indonesia is special, since the digital development is still at an early stage, but the growth of innovation through the creativity industry and startups are growing rapidly. This creates an opportunity and challenge for incumbent firms to build its digital infrastructure [11]. The new entries are able to offer customer solutions through over-the-top (OTT) applications that disrupt the incumbent firms. These startups have developed new products and services through economy sharing and co-creation with communities, which have become a disruption to the existing firms. There have been studies and research on this trend of disruption that are conducted worldwide. International business machines (IBM) has also conducted empirical studies on the role of co-creation. According to their 2015 survey on CEOs, 69% of CEOs strongly believe that the role of the CEO is important in order to earn the highest achievements in innovation through collaboration and co-creation with customers and partners. This supports another study on the significance of the role of company leaders and collaboration especially in digital leadership [12].

Digital leadership is a combination between digital culture and digital competence. The study of digital leadership is the part of the study about leadership based upon the upper echelon theory developed by Hambrick and Mason [13] where organization output can be predicted by manager characters. In terms of digital leadership, Pearl Zhu [14] defines the criteria of digital leadership which consist of five characteristics:

1. Thought leader, the capability to be tough in facing the market and competition change

2. Creative leader, a digital leader that has creativity and innovation mindset to formulate the idea into reality

3. Global visionary leader, a digital leader that has the ability to provide direction and to become an orchestra in transforming the digital business transformation

4. Inquisitive leader, with the complex and dynamic ecosystem due to volatility, uncertainty, complexity, and ambiguity (VUCA) factors, a digital leader that has to have the learning capability

5. Profound Leader, a style of digital leadership capability to lead in complex times with has in depth knowledge and understanding, to use their knowledge in interpretation, assumption and synthesizing the information to take the decision making

This study is important for digital transformation since it will bring the new transformation path model for incumbent firm by developing the digital leader to enhance the culture and digital competence. On the other hand, this study is also supporting the new construct of co-creation strategy before it was constructed from the marketing theory; with this study it will extend the new paradigm of co-creation to become a part of the strategy to grow. It will strengthen in developing of strategic management theory in facing market dynamic due to digital technology; the co-creation and collaboration strategy is the proper strategy to accelerate the transformation. Since the role of digital leadership is important to drive business model and collaboration through co-creation, and also limitation study on the role of digital leadership in relation with business model innovation and co-creation strategy [15], hence this chapter is going to discuss the role of digital leadership in developing co-creation strategy and business model innovation. The analysis path of effectiveness is important whether digital leadership has direct or indirect relationship to business model innovation. Co-creation strategy has played a mediating role in the relationship between business model innovation and digital leadership. The essence of this study to contribute more knowledge and add priority transformation actions for management in managing digital transformation and for scholar could contribute in finding the proper path analysis in transforming into digital service for established company. The chapter will start with introduction, thus exploring the theoretical background of the study by describing past research and construct variables. It will then continue with the methodology used in the study including the research model and hypotheses. The findings section covers the management analysis and opportunities for further research. Last, it will also cover the conclusion, implications, and suggestions for future study.

2. Literature review

2.1 Digital transformation in Indonesia telecommunication industry

Digital transformation is the hot topic in telecommunication industry. The concept of digital transformation has been discussed in the early 2000s called as Telco 2.0 [16]. The concept of Telco 2.0 focuses on customer-centric and innovative organization as the key success factors. Value migration consists of a combination of collaboration and business model innovation that leads to co-creation strategies of digital businesses.

There are a variety of types of digital transformation in the ICT industry. Based on the innovation framework, the transformation can be done through the following innovations [17]. There are four types of digital transformation in ICT industry as follows:

1. Transformation by products and services innovations (named inventors). This model is suitable to fulfill the untapped needs of customers, either partially or

completely, to create innovative digital products and services, that is, Apple, Google, GO-JEK with GO-FOOD, GO-CLEAN, etc.

2. Business models/innovation paradigms (named disruption) rely on customer experience, delivery model, and value propositions through digital technologies. Some examples include Uber, Amazon.com, Tokopedia, and GO-JEK. According to Das et al. [11], this disruptive scheme is believed to be the most successful scheme.

3. Business processes (named lean champion) increase the value by leveraging the value chain through digital technologies to increase efficiency and productivity, such as Walmart and Matahari Mall.

4. All round positioning innovation. Its transformation is done through a combination of products, processes, and business models supported by digital technology to strengthen the position of the products and services, such as Tesla.

According to the value mapping contribution and the nature of ICT firms in general, heavy investment is made in connectivity. The World Economic Forum [18] identifies four models of ICT firms with intensive investment to transform into a digital telecommunications firm, namely:

1. Connectivity provider for the future of the network. It has focused on the development of ICT infrastructure to enable other enterprises and OTTs across the industry, by investing and virtualizing the network. This includes investment on software-defined network, cyber security, and extended connectivity. This model is believed to have the highest contribution in the next 5–8 years based on its relevance with the nature and core competence of ICT firms. It requires an expansion of distinctive capabilities and organization of digital capability.

2. Beyond pipe. It integrates IOT and digital services to fulfill customer needs and businesses, to expand the business into becoming a digital player by adding value-added services. Capability in business model innovations is also required to generate new revenue on top existing infrastructure.

3. Redefining customer engagement. It is done to win customer loyalty and mindshare by providing features and tools to create better customer experience and to improve the service to match other industries. This requires capability on telecommunications to enhance customer relation, loyalty, and experience.

4. Bridging the gap in innovation. It is done by transforming the capability of innovation model and by increasing talent capability to work in digital and collaborate to co-create value with stakeholders. This requires the capability of collaboration and co-creation partnership strategy to accelerate and leverage existing assets.

Khanagha et al. [19] formulates the key evaluation of the succeed in digital transformation:

1. First, aligning internal activities with external rate and direction of change to develop strategy formulation and implementation. When the firm responds to the change, the proper time to do action is required to be exact, not too early or too late.

2. Second, retaining resources and capabilities to create distinctive organization capability to adapt to change. ICT firms have a large extent of capabilities and complementary assets; hence, the transformation should integrate with existing core and resource capability through new technology and business models.

3. Last, generating new revenue for product diversification and minimizing cost of change. It can be done by creating business model innovations and co-creation partnership strategies.

2.2 Business model innovation

Business model innovation describes how an organization could create, deliver, and capture value. The construct and modification of a business model is called business model innovation. Business models are broadly used in the value chain of businesses, including the process and integration with existing business processes [20]. Business models are also part of the implementation strategy in the context of sustainability for the incumbent firms [21]. Business model innovation plays a significant role in digital economy [22]. In the digital ecosystem, business model innovation is emerged as an alternative to process and product innovation [23]. In addition, business model innovation has an objective to create value, and the implementation of business model is dependent on the capability of managers and top leaders [8, 24]. Business model innovation is a part of digital transformation through rearranging business activities with greater value than before through the optimization of new digital technology [25–27]. Business model's innovation is a new holistic, integrated, and systematic way for organizations to provide the operation of innovations in order to create value in a dynamical environment through collaboration with their internal and external stakeholders [28].

In this study, we refer the concept of business from Amit and Zott [24] with the dimension of content innovation, structure innovation, and governance innovation.

2.3 Co-creation strategy

Co-creation is customer value chain collaboration activities start from design activities into promotion called as co-design, co-develop, co-deliver, and co-promotion [29]. In relation with innovation, co-creation strategy will strengthen innovation [30–33] including radical innovation [34]; in addition the concept of co-creation has an objective to develop value creation [35–37]. The new concept of customer has changed. In traditional management view, the consumers or partners are outside the value chain, while in modern company the consumer is an integral part of the system. The new paradigm changes the customers not as an object but a subject involving of value chain business activities. Traditional management views the consumers or partners to be outside of the value chain, while modern companies view consumers as an integral part of the system. The new paradigm also views the customers not as an object but as a subject involved in the value chain of business activities. Co-creation in innovation with external partners including customers has been an intense topic and called as an open innovation ([32]; Romero and Molina, 2009).

In a strategic level, co-creation can be utilized as a strategy to transform value propositions, working closely with customers and related party. In this paper, the extended concept of value creation is driven from marketing the co-creation concept based on the new 7S McKinsey framework [38] and value chain to put co-creation as part of the business strategy. In the new 7S McKinsey framework, the strategy is divided into three categories: strategy, capability, and tactical. Hence, the construction of co-creation strategy is defined as a co-creation vision

and direction, co-creation capability, and co-creation tactics. Co-creation vision focuses on the direction from a senior leader. Co-creation capability focuses on the development of people and process and technology to support implementation of vision. Co-creation tactics range from co-design, co-production, co-delivery, to co-promotion.

Based on the literature review, this study assesses co-creation strategy by the dimensions of co-creation strategy, co-creation capability, and co-creation tactical.

2.4 Digital leadership

In digital transformation, the role of leader is central in driving fast decision-making process and propelling the change [39, 40]. Digital leadership is a combination of leadership style of transformation leadership and the uses of digital technology. Digital leadership is defined as the combination of culture and competence of a leader in optimizing the use of digital technology to create value to the firms [41].

There are five characteristics: creative leader, tough leader, global visionary leader, inquisitive leader, and profound leader [14]. Since the competition becomes tight, hyper, and complex dynamic of the ecosystem due to VUCA (volatility, uncertainty, complexity, and ambiguity) factors, hence the leader is required to be creative and innovative through in-build capability or collaboration [42]. The global visionary leader is required to provide direction and to become an orchestra in transforming the digital business transformation. The internet and cloud technology as a main driver for fourth Industrial Revolution is heavily knowledge-based and requires overwhelmingly new competencies and capabilities, hence the leader has to have ability Inquisitive learning and has profound ability in knowledge and understand in depth in learning and change. Hence based on the literature review, the dimension uses for this study are creative, deep knowledge, global vision and collaboration, thinker, inquisitive.

In a disruptive era, the role of digital leadership to innovation has been discussed intensely [12, 43]. The previous study found that there is an impact of digital leadership on innovation including developing a business model; hence we develop the hypothesis as follows:

Hypothesis 1: Digital leadership has a direct impact to business model innovation in the Indonesian telecommunication industry.

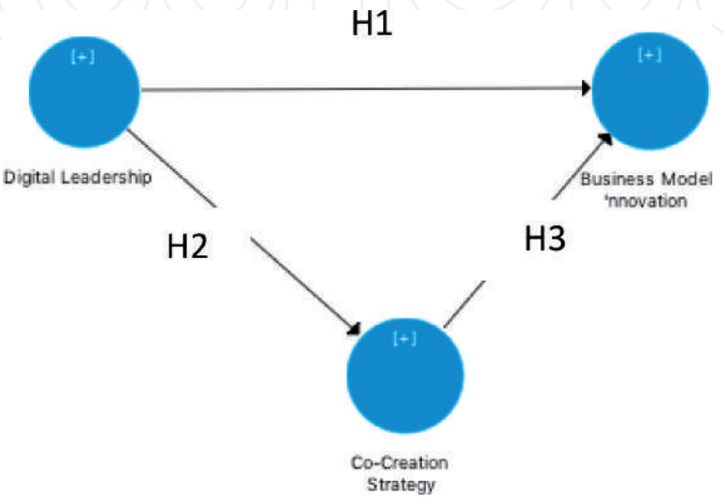

Figure 1.
Research model.

The relation of digital leadership and collaboration including co-creation has been discussed in a previous study [25, 44]. The previous study found that there was positive correlation between leadership in this case digital leadership and collaboration or co-creation study; hence, the hypothesis is formulated as follows:

Hypothesis 2: Digital leadership has a positive impact on co-creation strategy in the Indonesian telecommunication industry.

The strong impact of co-creation on innovation has been discussed in a previous study [31, 45, 46]. It was a strong impact of co-creation strategy on innovation including business model innovation. According to these studies, the hypothesis is formulated as follows:

Hypothesis 3: Co-creation strategy has a significant impact on business model innovation in the telecommunication industry.

Hence, **Figure 1** demonstrates the current research model.

3. Methodology

This study uses a quantitative research design. The units of analysis in this study are telecommunication firms in Indonesia with the management of these firms as the observed unit. The sampling method used is purposive sampling. The sample size is made up of 88 respondents where 75% of them is represented by general manager and manager leaders and 25% by VP and board leader. According to Hair, Hult, Ringle, and Sarstedt [47], the recommended sample size is 52 respondents for the model with an endogenous construct that has two arrows directed, 0.05 significance level, 80% statistical power, and minimum R2 = 0.25. The sample size of this research is 88 respondents. That is more than the recommended sample size. About 88% of the respondents are men and 12% are women. About 83% of the respondents come from the network provider, while 17% from service providers. Data were collected via self-assessment through an online questionnaire and distributed through messenger, WhatsApp, Telegram, and email. Since there is a limitation of the data sample, the statistical tool of analysis is SmartPLS.

4. Result

The result of statistical tool has been tested through outer, inner, and hypothesis testing. The analysis of the outer model specifies the relationship between latent variables and their indicators. Tests performed on outer models include:

1. Convergent validity. The value of convergent validity is the value of loading factor on the latent variable with its indicators. The expected value is above 0.7.

2. Discriminant validity. The value of cross loading factor that is useful to assess whether the constructs have adequate discriminant by comparing the loading value on the intended construct which is greater than the loading value with other constructs.

3. Composite reliability. Data that has a composite reliability over 0.7 which is considered as highly reliable.

4. Average variance extracted (AVE). Expected to be more than 0.5.

5. Cronbach's alpha. Reliability test reinforced with Cronbach's alpha. The result is expected to have a value of more than 0.6 for all constructs.

In testing the construct validity and reliability, the result showed that the result for AVE value is >0.5, Cronbach's alpha is >0.6, and composite reliability is >0.7. It means that research variables have good reliability for all variable and dimension. In discriminant validity, the result showed that the diagonal numbers indicate the square root of AVE is higher compared with the left row number. It means that the dimension has a good discriminant validity. The testing of convergent validity showed that all values of the loading factor of outer path analysis for t value are >1.96 and p-value is <0.05 which means each indicator is a valid measurement tool in measuring latent variables; a similar result for outer path analysis has shown that all constructs have a path coefficient score with t-statistics of more than 1.96 and p-value = 0.000 < 0.05, which means that all constructs have a significant association with their dimensions.

The second testing is inner test or structural model testing. The testing is using a blindfolding score. The result showed that the score of blindfolding, Q2, was obtained for co-creation strategy = 0.277 and business model innovation = 0.486. If Q2 is >0, it indicates that the structural model has adequate predictive

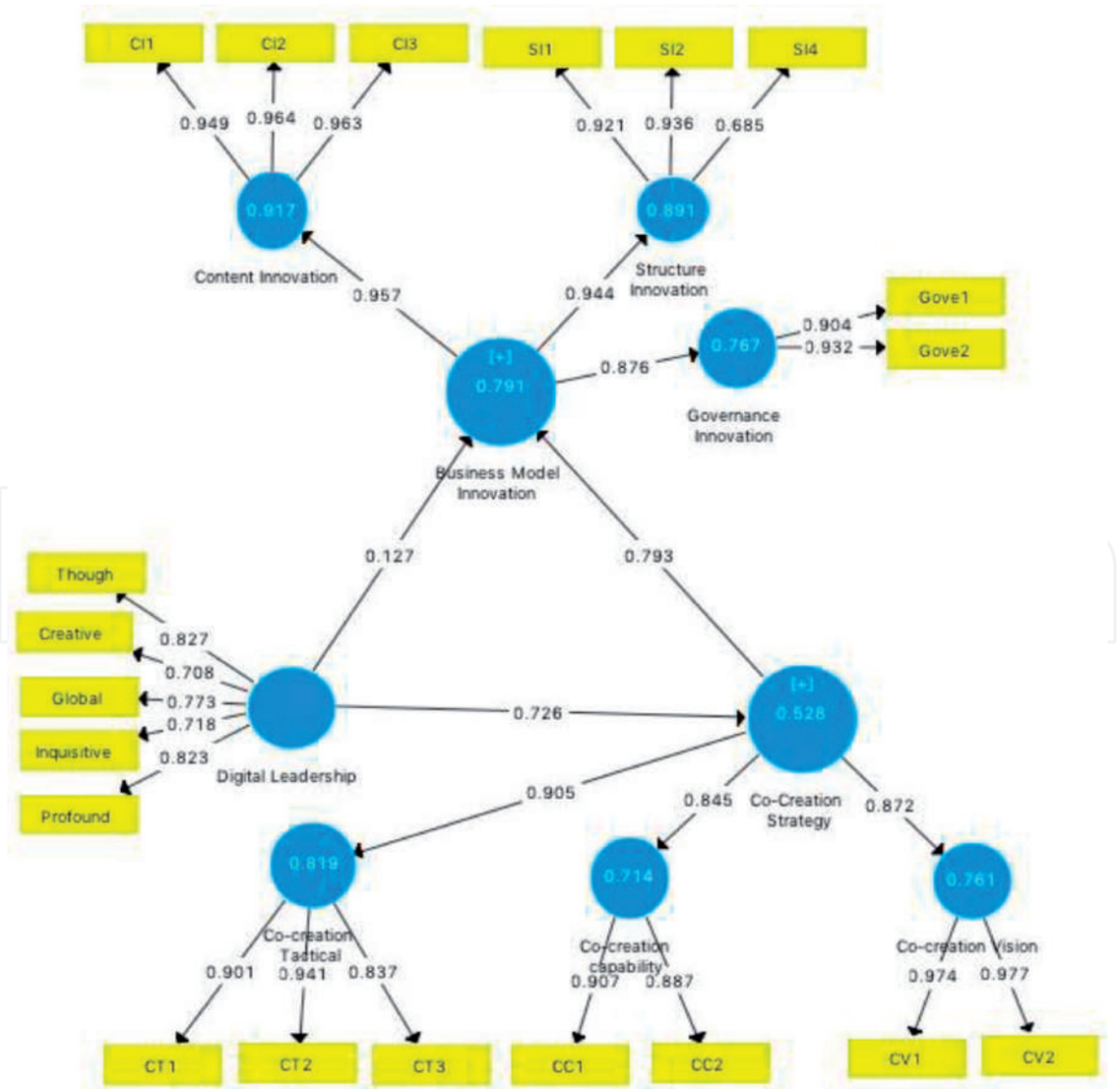

Figure 2.
Path analysis result.

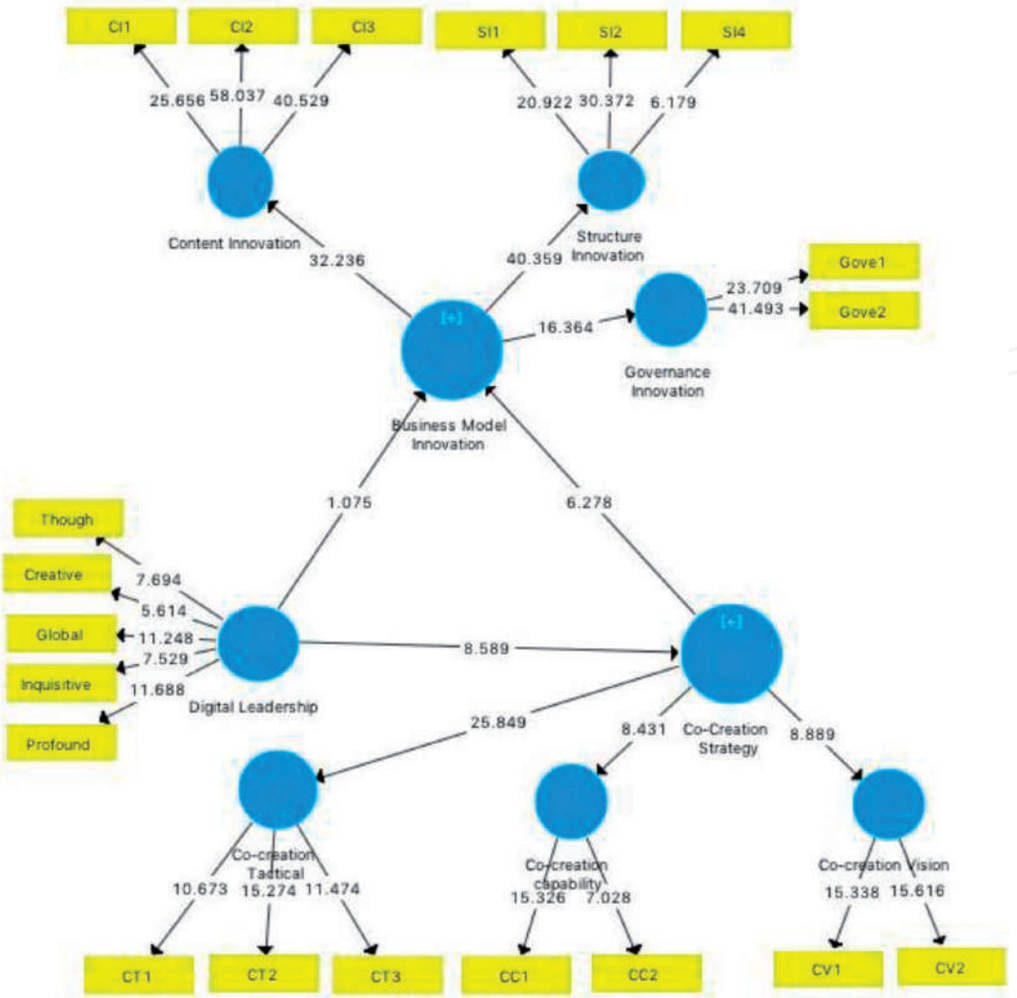

Figure 3.
Research Finding.

Hypothesis	Path analysis	Path	Standard deviation	T statistics	P values	Result
Direct effect test						
H1	Digital leadership > Business model innovation	0.127	0.116	1.075	0.274	Not significant
H2	Digital leadership > co-creation strategy	0.728	0.082	8.589	0.000	Significant
H3	Co-creation strategy > Business model innovation	0.793	0.129	6.278	0.000	Significant
Indirect effect test						
	Digital leadership > co-creation strategy-business model innovation	0.576	0.126	4.569	0.000	Significant

Table 1.
Hypothesis testing result.

relevance. It is seen that the model formed is robust. Hence the next step is to conduct hypothesis testing.

The result is shown in **Figures 2** and **3**. In **Figure 3,** it can be seen that if t value is >1.96, it means that the independent variable has a significant influence on the dependent variable. The result in **Figure 3** shows that digital leadership has a

significant influence on co-creation strategy but not a significant influence on the business model innovation; and co-creation strategy has a significant influence on business model innovation.

The direct effect test shows that the relationship between digital leadership and business model innovation has a path coefficient score of 0.127 with t-statistics = 1.075 and p-value = 0.274 > 0.05. This means that H0 is accepted and H1 is rejected. This indicates that digital leadership has no significant impact on business model innovation. The second assessment is the relationship between digital leadership and co-creation strategy has a path coefficient score of 0.728 with t-statistics = 8.589 and p-value = 0.000 < 0.05. This means that H0 is rejected and H1 is accepted. This proves that digital leadership has a significant impact on co-creation strategy, while the relation between co-creation strategy with business model innovation has a path coefficient score of 0.793 with t-statistics = 6.278 and p-value = 0.000 < 0.05. This means that H0 is rejected, while H1 is accepted. The co-creation strategy plays significant role in relationship between digital leadership and business Model innovation (**Table 1)**.

The indirect effect test shows that the mediating role of co-creation strategy has a path coefficient score = 0.576 with t-statistics = 4.589 and p-value = 0.000. This means that H0 is rejected, and H1 is accepted. This proves that co-creation has a supportive impact as a mediating role on relationship between business model innovation and digital leadership.

5. Discussion and implication

5.1 Discussion

The results are aligned with the study on disruption technology and innovation conducted by Christensen [9, 48] where the incumbent firm should adapt the changing of market through creating innovation business model by driving digital transformation. The path analysis showed that digital leadership has an indirect path in developing business model innovation. This is aligned with study on agility where the firms have to have agility learning to sustain their business [49]. This also aligns with the transformation stage of digital leadership where the incumbent requires to gradually transform from digital savvy where digital is used for personally and coloration purpose into digital agility where digital is used for business model innovation, and the ultimate of digital leadership is to become a disruptive innovation where the digital is part of radical innovation in exploring the new market [50]. Hence, the collaboration is the fastest way in developing business model innovation due to the gap of incumbent capability. The dimension of digital leadership is derived from Global and profound leader where the leader always thinking global the new way in doing business and they have deep and profound knowledge in taking risk and decision making. This finding supports Rudito and Sinaga (2017) where the digital leadership is becoming a part of culture and competence of the leader in optimizing the use of technology. This finding brings the implication for incumbent firms to use digital leadership to establish business model through co-creation strategy driving for open innovation [32, 51].

Co-creation strategy puts the external parties to be involved in the value chain to develop business model innovations. With a strong reputation, firms can control and attract valuable customers and stakeholders to create more value in a series of activities. From a customer or stakeholder point of view, they will be able to see the benefits of the part of the system for value creation. Customers or other parties can bring influence in the creation of value together with the firm. In this study, we found that in the developing of co-creation strategy, what is important is the

factor of implementation which is co-creation tactical. It means that the execution of co-creation concept is important to support the developing of business model innovation. The finding supports the strong influence of co-creation on business model innovation [31, 45, 46].

Business model innovation is mostly supported by context and content innovation due to the relation with co-creation strategy. When the firm has to deal with the collaboration with partners, the structure of collaboration or co-creation and the content of innovation are significant factors to drive and control the co-creation value chain. The finding demonstrated that the governance is still important, but less priority compare with content and structure of innovation.

In an indirect test, it shows that co-creation is a mediating role in the relationship between business model innovation and digital leadership. Co-creation strategy plays a significant role on relationship between business model innovation and digital leadership. Co-creation strategy is developed from vision and direction from digital leadership and combining with external co-creation will impact in strengthen business model innovation. This path is more valuable than using customer experience directly to form business model innovation. This finding supports the findings in previous studies where the leadership through collaboration will strengthen innovation in the business model ([32]; Romero and Molina, 2009).

5.2 Implication

The implication to managerial practice, study has revealed the important of digital leadership in digital transformation to anticipate the digital disruption. The digital transformation is essential started from the vision and mission of the digital company to provide direction of the desired future position of the company. Weill and Woerner [52] define the vision and ambition into four matrices based on the matrix of end customer knowledge and business design. There will be four possibilities of the digital company: (1) when the business design is the value chain and the knowledge of the end customer is partial, the company vision is to become a supplier company such as a manufacture company that part of supply chain business in providing good and commodities without in-depth knowledge of customers. (2) when company has the complete supported ecosystem business but partially recognize knowledge of end customers, the company is characterized as a modular business firm such as payment company, that provide service as plug and play and be likely more innovative due to rapid changing of ecosystem; (3) when the company has the knowledge of end customer completely and business design is based on value chain, the company vision is to become a multichannel business such as a bank company that provides the customer experience over value chain; and (4) the vision company is distinguished as ecosystem drivers when ecosystem business design and the knowledge of end customer are completely accomplished. A digital telco company and Internet service provider are example companies that provide a great customer experience with lean organization and optimize the digital technology to drive ecosystem enabler (**Figure 4**).

The transformation brings the telco company to enabler ecosystem driver. In anticipated the disruption from new entries due to diminishing on innovation and customer experiences, incumbent telco should focus on customer experience and digital innovation while at the same time build the digital ecosystem to support the vision and ambition toward digital company.

The foundation of digital transformation is operational excellence. Incumbent telco shall ocus on developing lean process and organization through digitalization process and developing people capability in digital competence and culture.

Strategic implementation shall be cascaded from vison and mission derived from digital leadership, thus, to build distinctive capability and customer

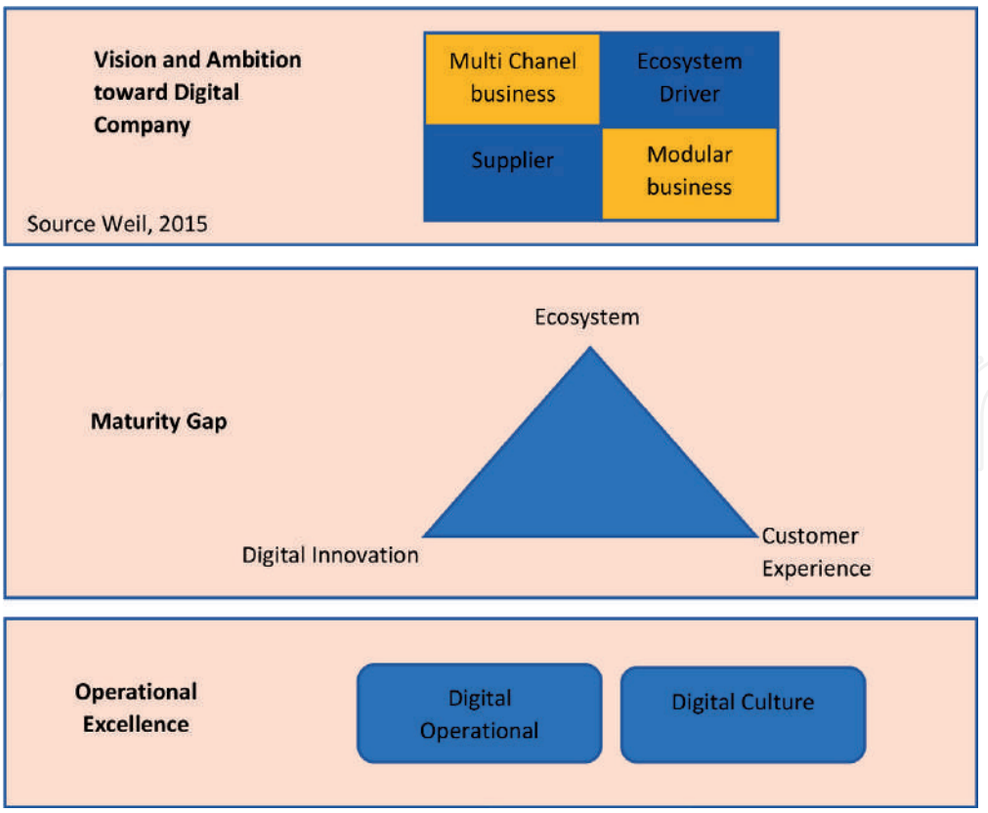

Figure 4.
The framework of telco digital transformation.

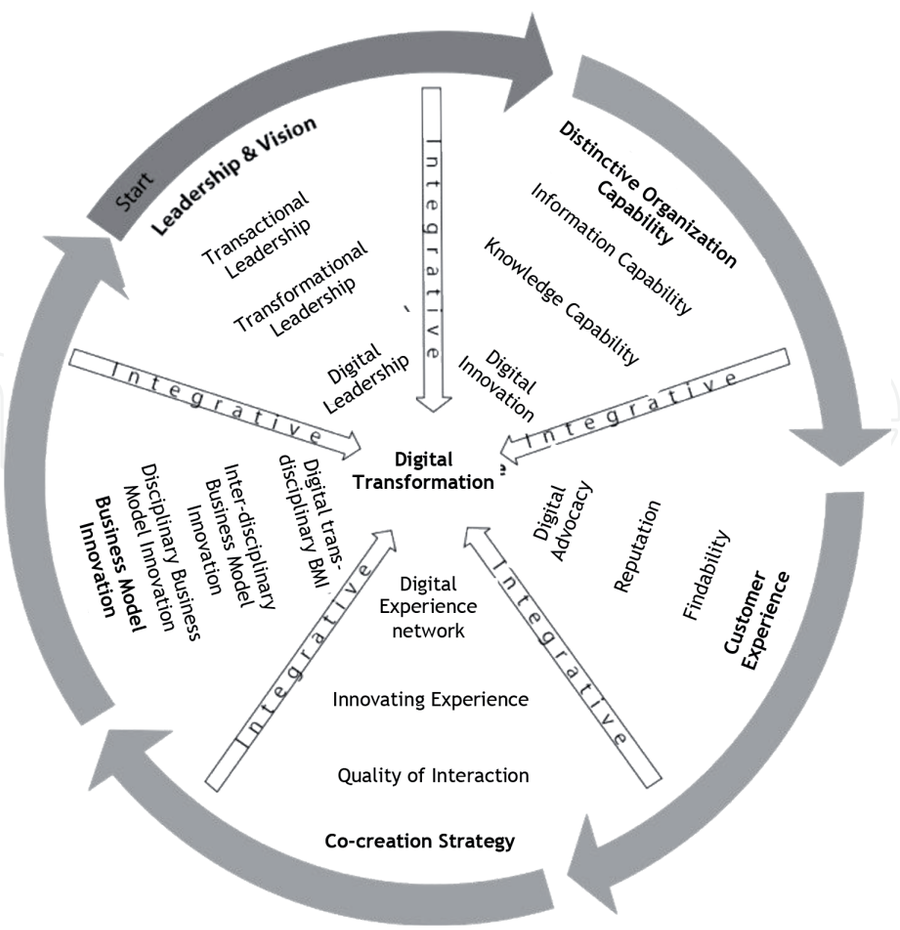

Figure 5.
Digital transformation model based on Mader's framework (2012).

experience orientation, then collaborate with co-creators in developing co-creation value and to build business model innovation. The implementation strategy is a continuous learning as part of developing dynamic capability start from sensing of market, seizing co-design and transform capability. We configure the model of digital transformation for Indonesia incumbent firms based on a framework study conducted by [53] as shown in **Figure 5**.

These findings have practical implications for the management in facing digital transformation. Digital transformation reflects management leadership and vision in transforming leadership from transactional leadership to a more transformational and digital-lead leadership. The leadership and vision will drive the development of distinctive organizational capabilities, from capabilities in the information age to digital innovation capabilities. Co-creation strategy based on distinct organizational capability and customer experience at a customer advocation level could drive the business model innovation up to the level of digital transdisciplinary business model innovation where the business model is developed based on co-creation value across disciplinaries.

5.3 Limitation and future research

This study is an exploratory research that aims to explore but not to confirm the theory. This research just wants to make prediction about the structural model of Business model innovation, and co-creation strategy in relationship with digital leadership. For the future research, this study suggests some recommendation, such as (1) using a larger size of sample for larger telecommunication companies in Indonesia, and it may be better for modeling and statistical analysis to utilize covariance-based better statistical application, (2) using probabilistic sampling methods such as stratified random or cluster sampling so that the result of study could be more relevant to make a generalized conclusion, and (3) longitudinal research should also be done to ensure in assure the role of co-creation strategy in relationship of business model innovation and digital leadership.

6. Conclusion

Based on the results of hypotheses testing, it can be concluded that digital leadership has indirect impact to business model innovation, where co-creation strategy has a mediating role on the relationship between business model innovation and digital leadership.

Further study can be explored using a more extended sampling, with industry, and with consideration of markets outside of Indonesia. A longitudinal research design should also be done to assess a direct and indirect impact of digital leadership into the business model innovation to provide value to the firms.

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Chapter

Implementation of a Digital Workplace Strategy to Drive Behavior Change and Improve Competencies

Ileana Hamburg

Abstract

Digital technologies are integrated in many aspects of life and work and present benefits and challenge for organizations, employers, and employees. In order to have advantages from digital transformation, organizations should be creative for new working environments and their culture around digital developments in the workplace in order not to lose clients, productivity, and employees. Some keys of success of digital workplaces are an effective implementation of a digital workplace strategy with a changed learning and culture as an incentive for staff behavior. This should suit to technological solutions and support its adoption and use it for work, communication, and cooperation. Entrepreneurship education should be also adapted to digital transformation in order to prepare employees and employers for digital workplaces.

This chapter presents besides some aspects like a digital European workplace initiative and a framework, which could be the basis of a digital workplace strategy, some proposals for improving entrepreneur's skills. As an important issue of a digital workplace strategy is a suitable learning concept to foster a digital culture and employees' behavior which can be integrated into entrepreneurship education and training programs in order to prepare entrepreneurs for the digital transformation and digital workplaces. The author works in many European projects aimed to improving work and education/training of entrepreneurs in digital era and included in this chapter issues necessary for small- and medium-sized companies (SMEs) resulted from surveys done within some of these projects about SMEs' problems that have in connection with digital transformation and of organized training.

Keywords: digital transformation, digital workplace, digital workplace strategy, culture, behavior, entrepreneurship, SME

1. Introduction

The increasing integration of digital technologies in all aspects of our lives is both a benefit and a challenge for organizations, employers, and employees.

Organizations are benefiting from such digital transformation including also digitization of the workplace, i.e., through increased productivity, cost savings, a more mobile and agile workforce, increased flexibility, and adaptability in marketplace. Enterprises are collaborating more globally and with more diverse and global

staff. Employees could work from anywhere and stay connected through smartphones, collaborate with peers, and stay on top of digital trends. Organizations should be proactive in creating new systems and policies and rethinking their culture around digital developments in the workplace in order not to lose clients, productivity, and employees.

The keys of success of digital workplaces are an effective implementation of a digital workplace strategy with a changed learning and culture. Culture is an incentive for behavior; organizations and managers should assure that staff behavior suits to technological solutions, supports its adoption, and uses it for work, communication, and cooperation. Entrepreneurship education should be also adapted to digital transformation in order to prepare employees and employers for digital workplaces.

This chapter presents besides some aspects like a digital European workplace initiative and a framework, which could be the basis of a digital workplace strategy, some proposals for improving entrepreneurship skills. As an important issue of a digital workplace strategy is a suitable learning concept to foster a digital culture and employees' behavior which can be integrated into entrepreneurship education and training programs.

The role of entrepreneurs and of entrepreneurship education and how it will be changed in order to prepare entrepreneurs for the digital transformation and digital workplaces are shortly presented.

The scope of this chapter is on one hand to discuss with academics who work in the field of digital transformation and with students to find new scientific methods for problems like cultural and behavior change; on the other hand, the author has experience in learning methods for entrepreneurs and would like to help organizations and employees particularly in SMEs to achieve skills and competences for a successful digital transformation and digital workplace results.

The author works in many European projects aimed to improving work and education/training of entrepreneurs in digital era and included in this chapter issues necessary for small- and medium-sized companies (SMEs) resulted from surveys done within some of these projects about SMEs' problems that have in connection with digital transformation and of organized training. The author works currently at the planned training modules and will organize training sessions with SMEs from Germany within the current European project Reinnovate.

We think the problems discussed in this chapter will be used also within the German initiative Mittelstand 4.0-Kompetenzzentrum standards which supports companies and staff within digital changes. The author discussed with some companies within this program about changing culture and staff behavior within digital workplaces and how to improve entrepreneurs' digital skills.

2. Digital transformation

It is known that the development and proliferation of information and communication technology changed the ways in which employees connect, collaborate, and communicate.

These changes have been accelerated also due to trends like:

- Aging workforce and the need to capture their knowledge;
- Necessity to meet the varying needs of a multi-generational workforce;
- Information overloaded and technology helping employees to find what they need to work faster.

These trends require a digital transformation and a reshaping of work environment.

Digital transformation can be understood as improved business processes through digital technology. It means better collaboration between staff, efficient collaboration with customers, stronger and more productive relationships with partners, and increased potential by changing work styles.

The main drivers of digital transformation include traditional digital technologies [1, 2], i.e., infrastructures (i.e., networks, computer hardware) and applications (i.e., apps on smartphones, web applications), and the digital exploitation potentials [2], i.e., possible digital business models and digital value creation networks.

In the narrower sense, digital transformation often refers to the change process within a company triggered by digital technologies and customer expectations. However, it is a process of change affecting a variety of aspects of our society and does not end up in companies [3].

Digital transformation in organizations happens in many ways; employees and employers have different hopes [4]:

Managers want:

- that their employees work together more effectively to boost productivity;
- that their clients are content and to gain new ones through better customer service;
- to use digital technologies to minimize costs;
- to improve business processes;
- to be better than their competitors;
- to use digital transformation to remain relevant in the face of the quickening pace of technology advances.

Employees would like:

- to work with digital toolsets according to their tasks, experience, and working style;
- to have workspaces making possible to collaborate more effectively within their jobs and also due demands to increase productivity and cut costs, making it harder for employees;
- to be helped to meet market expectations.

Achieving such goals can be a long and difficult process because digital technology and change management issues influence workplace transformation. Developing and working on a digital workplace strategy can challenge the most forward thinking of business leaders.

There are big differences between organizations referring their digital transformation initiatives:

- Some of them develop some strategy and understand the benefits.
- Others are still in the early stages of developing a plan not knowing valuable ways about how to go about defining their goals for a digital transformation.

3. What is a digital workplace?

The emerging digital workplace, considered the natural evolution of the workplace, can address issues listed above and helping organizations [5, 6].

The digital workplace includes all digital technologies and services people use to get work in today's workplace—both which already exist and ones to be implemented. It ranges from HR applications and core business applications to e-mail, instant messaging, and enterprise social media tools and virtual meeting tools.

Frank Schönefeld defines the digital workplace as the "totality of the required access infrastructure, applications and device platforms of information or knowledge workers who need them to perform their work tasks and engage in collaboration" [7].

Digital workplaces could:

- support changes in working styles enabling employees to work more transparently and better use social networks.
- unify offline and online communications by keeping employees connected through their mobile devices to provide anywhere, anytime access to tools and corporate information.
- focus on employee experience by providing them with user experience they have outside the firewall. They provide choice, flexibility, and personalization.
- support virtual work environments that allow employees to stay connected in distributed and virtualized work locations while balancing customer privacy and operational risk.
- minimize spending and enhance productivity by providing employees with the right tools and right information at the right time.
- win the war on talent by offering the progressive and innovative environments that top candidates now [8].
- Digital workplace as a portal is "a solution for the integration of information and services in a common user interface" [9] because different services and components are combined in one user interface and made available to the user mostly web-based.

Integrated data can be used via interfaces in different applications. Users can combine existing data and create new applications based on it.

The conception and deployment of the workplace are among the key strategic activities for the European Commission in the years to come. The digital workplace initiative is also an important part of the ICT chapter of the 2016 Synergies and Efficiency Review.

The digital workplace initiative will provide staff with the right IT tools, platforms, and services, enabling users to work and collaborate anywhere, anytime with a fit-for-purpose security and optimizing their work experience and productivity. It will be adaptive and flexible to incorporate different types of users, new behaviors, and new technologies [10].

Within the conceptual framework underpinning the digital workplace initiative in the Commission staff is at the center, with a particular focus on the excellence of user experience. A staff member should be able to connect anywhere and at any time, through simple and secure authentication mechanism, on a variety of mobile

devices to a number of corporate services. The data will be stored on a hybrid cloud model, ranging from on-premise (European Commission Datacenters) to public clouds depending on the classification of the data [10].

The six strands of the digital workplace initiative are:

- A balanced mix of mobile devices, either corporate or BYOD, allowing connection from anywhere and at any time. There are constraints about using corporate tools on private devices and vice versa, but they may be resolved with a good compromise between usability and security.

- Office automation comprising supported operating systems, word processors, spreadsheets, presentation-authoring tools, access to files, etc. An architecture enabling hybrid services become progressively more important especially when the mobile dimension perspective is incorporated.

- Mail and calendaring, including the central role of e-mail and its tight integration with calendar tools as a way to send messages, share information, and manage time and meetings.

- Unified communication encompasses different sources of real and near-real-time communication, which include videoconferencing and the future of telephony (telephony becomes an app, the classical telephone is replaced by the single mobile device).

- Collaboration and social networking, covering the main aspects of collaboration (from document to tasks), communities, and social networking, with special attention on their right availability, security, and integration in mobile platforms. Fast access to the relevant information is an essential in the digital workplace. Therefore information management and corporate search, as very strong integration elements, will be part of this component.

- Integration and identity and access management. The future digital workplace will be based on a hybrid platform with a combination of on-premise and cloud-based solutions to take the maximum benefit of technology development and to allow mobility.

By implementing the digital workplace initiative in the European Commission, it is intended to realize the following objectives:

- Increase staff engagement. Engage employees and raise motivation through an effective, efficient digital workplace.

- Increase staff productivity. Allow productivity improvements by providing the most suitable and effective digital workplace to each staff member.

- Enable a more modern and efficient office space design.

- Staff from many organizations already use many of digital components, i.e., responding to e-mails from smartphones, checking their paying online, or digitally enter a sales opportunity, so that organizations do not have to build the digital workplace from the ground up.

In the next years, the workplace continues to evolve, and employee expectations shift so that organizations that do not embrace digital workplace risk falling behind [10].

4. Digital workplace strategy

The key of success of digital workplaces lies in an effective implementation of a digital workplace strategy, and the first step in this transformation strategy is a cultural change supported by learning measures.

Digital workplace strategy can be understood as the dynamic alignment of an organization's work patterns within the digital work environment to enable peak performance and reduce costs. As each workplace strategy, a digital one supports to fulfill business objectives such as reducing property costs, improving business performance, merging two or more organizations/cultures, and relocating or consolidating occupied buildings. The workplace strategy and its implementation quite often occur at an opportune moment such as a property lease break or a company merger or acquisition [4, 11].

Some special reasons to build and adopt a digital workplace strategy could be the following [4, 12, 13, 14]:

- Talent attraction: many employees would opt for a lower paying job if they could work out of office, i.e., at home.

- Employee productivity can increase through online social networks.

- Employee satisfaction can be higher by installing and using social media tools internally.

- Employee retention is more stable when employee engagement increases.

- Newer communication tools, particularly instant messaging, are preferred over more traditional ones like e-mail or team workspaces.

Many organizations are convinced about the importance of a digital workplace strategy and invest money in supporting digital workplace strategies that promise ROI. Sure, to support these outcomes, you need to assure for employee's tools they need to collaborate, communicate, and connect with each other. Clear road maps should be created to ensure digital workplace with measurable business, deliverable, and minimal risks.

Business drivers for building a digital workplace strategy are:

- Rapid technology change is enabling a different workplace and work; some examples are artificial intelligence (AI) and big data combined with increasingly available collaboration tools.

- Employees' expectations of a different workplace experience supported by ubiquitous connectivity and rapidly advancing social technologies.

- Citizens demand digital service delivery and a different relationship with the government: There is clear citizen demand for quality online services to match their experiences with other service providers. This requires a digital-first workplace to work effectively.

- Often workplace strategies are developed by specialist workplace consultants, or by an architectural practice. "The successful implementation of a workplace strategy requires an interdisciplinary team, internal and external to the

organization. A workplace consultant may be retained to engage the team, help define success criteria, manage the process, and assess results" [13].

- External workplace consultants are professionals from a number of backgrounds: business management, interior design and architecture, building surveying, real estate and facility management, human resources, and building research.

In the file [8], a proposal for a digital workplace framework is presented with the following layers:

4.1 Collaborate, communicate, and connect

The employees should be able to do their job by using digital technologies for collaborating, communicating, and connecting with others. Productive business relationships can be created within and beyond natural work groups and enable knowledge sharing across the organization. In the next part, we develop this issue.

4.2 Technology: the digital toolbox

Each organization already has a digital workplace toolbox with different tools to support digital workplace in different ways. It is necessary to adopt the right tools for employees to do their jobs. The digital workplace toolbox can be defined in categories to support the ways in which you communicate, collaborate, connect, and deliver day-to-day services. Often the development of digital tools does not follow a digital workplace strategy where the business focus is clearly defined. Organization culture should be also considered.

4.3 Control: governance, risk, and compliance

Some components of digital workplace governance are:

- Guiding principles: identify the business goals to be achieved with the digital workplace, and translate them into guiding principles to drive ongoing development.
- Information governance strategy: determine the focus of digital workplace strategy, and align it with organization's existing information management or information governance strategy.
- Roles and responsibilities: identify key stakeholders, and create a suitable and sustainable interaction model.
- Training and certification: ensure employees have access to training to be prepared to have advantages of digital developments.
- Policy training: in addition to technical training, employees need policy training.
- Orchestrated presence: by organizing channels within the digital workplace.
- Crisis management: if a crisis occurs, react quickly (within the first day).

4.4 Business drivers: measurable business value

To deliver the necessary benefits, an organization should guide the direction of digital workplace development.

Some ways to achieve measurable value:

- Increase revenue.
- Reduce operational costs by introducing more effective ways to meet virtually, cutting travel and telecommunication costs and eliminating wasted time at the airport.
- Accelerate time-to-market by using tools to support research and develop, test, and deliver new products and services more quickly.
- Enhance innovation.
- Improve the customer experience.
- Increase agility and flexibility: provide the tools that mimic organization and business changes and reflect employee behaviors.
- Heighten staff satisfaction, i.e., by implementing easy-to-use tools.
- Strengthen talent recruitment and retention.
- Improve employee experience.

5. Cultural change and behavior supporting digital transformation

One of the first steps in the digital transformation is a cultural change in organizations. Culture is an incentive for behavior; organizations and managers should assure overcoming a culture of learned helplessness and spoon-fed training to encourage ongoing personal learning so that staff behavior suits to technological solutions, supports its adoption, and uses it for work, communication, and cooperation. One important issue of the digital workplace strategy is a clear understanding between organizational culture and technology, and this can be achieved within an adequate learning strategy. It ensures that tools, processes, and systems realize their full potential and will not be a failed initiative.

Organization's culture influences the way employees behave and work within digital transformation and so organizational performance, success, and failure. This means employee's culture ultimately determines how and to what extent employees connect, communicate, and collaborate within digital workplaces.

It is important to develop a change management plan and that the digital workplace strategy aligns to organization working culture. This cultural change and suitable technological components can contribute to improve:

- Collaboration by integrating intuitive, easy-to-use collaboration tools that enhance employees' ability to work together and support their own working style and wishes

- Communication by using digital tools to create their own content, rather than simply consuming existing content, to support that right information reaches the right audience, bilateral communication, and personalization of content

- Connections across the organization and outside

The free flow of information at the digital workplace has a positive impact on agility and innovation of organizations, and it promotes employee engagement and satisfaction by delivering the right information to the right people at the right time. One problem is how managers/leaders in organization can influence employee's behaviors and practice changes, conducting to innovative products and services that will enable the transition from old business models to ones successful in a digital world.

Isaac Sacolick presents three ways to enable employees to participate more in digital programs [15].

5.1 Encourage people to ask questions

Determining possible employees to ask questions enables them to move away from "the way we always do" to discussions what is better to do in digital working places.

That is, operations team wants to explore using automation to eliminate repetitive discussions. Someone asks, "How can we learn to be product owners in its agile development process?"

Sure, there are some people in the organization wishing to do things in the old way. Asking questions is an approach, which can open a dialog about new solutions.

5.2 Get out of the office and meet customers and prospects

Customers expect to select products and services intelligent and valuable. Start-ups and market leaders in other categories can steal market share from slow competitors not being in contact with customers but have also opportunities to develop new services into new areas by identifying optimal customer segments to deliver services digitally.

Leaders/representatives from organization should go out of the office, learn from customers, take into consideration their needs, and develop a perspective on how to deliver new experiences. Marketing specialists should learn how to best message and target prospects. Sales should be learning whom their new competitors are and how to defend against sales objections. Technologists should learn about the underlying technical capabilities required to fulfill value propositions.

5.3 Ask for data, then insights, then opinions

A data-driven organization offers practices and tools for people to present a thesis—first presenting data that backs it, then insights they have inferred, and lastly their opinions and conclusions. Behaviors drive organizational change.

Employees' roles in the organization, their jobs, and how they deliver business value are all subject to be changed in digital transformation, in order to convince more employees to support the digital strategy by challenging the status quo, to learn what customers need today, and to use data efficiently to drive bottom-up and top-down decisions.

5.4 Adaptation of employees to digital transformation and digital workplaces

When an organization suffers changes in everyday functioning like digital transformation, both employers and employees must face challenges; if employees do not keep up, chances that transformation to be successful are very low.

In the following experts, make some proposals to help employees to adapt to digital transformation [16].

5.5 Open dialogue

It is known that employees are sometimes resistant to change when the transformation comes only from up, so it is important to create a dialog with employees to discuss which and how they see improvements in digital transformation. If it is possible, the open dialog should start from the top and involve all employee's transformation. One leader in organizing digital transformation should bridge the gap between the actual implementation of technology and the workplace culture and demands.

5.6 Invest in training

"Let people understand the reasons for the change, and make sure they have a clear picture of what will improve when they get there," says Dr. Daniel Cable, professor and chair of organizational behavior, at London Business School. It is important to foster a culture of change and make sure employees develop the skills to keep up with a fast paced and dynamic environment. All employees should be encouraged to go through the company-training program to drive adoption.

5.7 Foster a culture where experimentation is allowed and encouraged

First employees can freely experiment without fearing the consequences of mistakes. Often, they discover new and faster ways of doing everyday tasks, increasing efficiency and productivity.

5.8 Support collaboration

Online and offline communication can easily be unified keeping employees connected through their own devices. Digital connections often reach down generational gaps and bring employees of different ages together. New digital communication fosters collaboration in departments and across the organization. The digital transformation should not be felt only as technology change but more like intuitive ways to complete tasks.

5.9 Involve employees

Embracing digital transformation is more easily achieved through increased employee engagement. Using digital technologies employees can reach consumers easily and directly.

Often, older employees are not enthusiastic about digital transformations, but their insight, wisdom, and experience are invaluable. By improving internal employee engagement, employees can feel more valued and are more open to change. Engagement drives adoption, but digital transformation too can drive engagement. Flexible work has positive effects on employee engagement. In the digital age, flexibility is easier than ever to implement. Employees can work

remotely, use their own devices, and utilize digital tools to interact impactful with consumers and each other. Tangible benefits of digital transformations are easier to be evaluated.

6. Learning, training, and entrepreneurship education

A key success factor in digital transformation of an organization is a training and learning concept with three areas of focus [17]:

- how an organization bridges its digital skills and confidence gaps
- how an organization encourages people to take responsibility for their own continuous learning
- how an organization challenges and supports its senior people to become digital leaders

Some years ago, learning was focused on training people to fulfill their tasks (job training) and occasional additional skills, and there was little need for most workers to be always learning. Now, when all organizations must cope with the uncertainty, complexity, and ambiguity of the digital economy, they have to try to become more agile and adaptive. Intelligence and small-scale decision-making must be distributed to the edges of the organization, so that each team and function is free to learn and adapt based on customer and market feedback [17].

The learning process in organizations wishing to be successful within digital transformation should be changed from a process-centric world of job training to a service-oriented world of continuous learning and improvement in the flow of work. Many organizations developed digital workplace platforms and tools; learning around the digital workplace should help employees to understand how these tools can improve their work, achieve digital skills, and help the organization to have more advantages from its existing technology investments.

Some aspects should characterize the learning in the time of digital transformation [17]:

- The digital workplace needs a learning hub/community to accelerate change and adoption of new ways of working.
- A combination of informal, active, social learning + digital guides and a suitable methodology is a good approach to this.
- Minimum digital fluency is required to work in modern organizations.
- Leadership development programs need to change to avoid the behavior of some senior people becoming the biggest barrier to change.
- In the modern technology-augmented organization, learning will not be a separate activity, but a daily part of work with occasional focused learning on new specialist skills.

Referring to necessary skills of entrepreneurs to work within digital workplaces, the European Union team underlines team working, communication, entrepreneurship and innovation, and intercultural skills as as "necessary to drive creativity and

innovation and cope with complexity and uncertainty in a fast-evolving workplace" [18, 19] and new skills for success at macrolevel, i.e., digital fluency referring to the ability to use digital tools and resources existing in companies to do a specific task at workplace and be successful. Another skill is the ability to deal with a change which significantly increases. Adaptability and cognitive flexibility help people to change the way when business needs shift.

It is known that information and data are used more frequently to achieve business goals, to make decisions, and to build strategies. The entrepreneurs should be able to asses and analyze data and information.

The EntreComp framework [20] outlined by the EU Commission, 2016, highlights that entrepreneurship should not be limited to those people setting up businesses but in all aspects of life. "Entrepreneurship is when you act upon opportunities and ideas and transform them into value for others. The value that is created can be financial, cultural, or social" [21].

Entrepreneurship requires innovation, knowledge about industry/market, and adaptability to different business. In order to be prepared for a successful career, it is necessary that students understand what means entrepreneurship and use entrepreneurial skills to achieve career goals.

Entrepreneurship education and training refers to the use of a variety of skills to develop a culture of entrepreneurship [21] aimed at the development of behavior, attitudes, and capacities that create value.

Entrepreneurship and entrepreneurship education have an important role in social and economic developments.

Addressing a global challenge such as youth employment requires global actions to prepare them for digital workplaces. It is known that young people are natives of the digital realm, relatively few possess the skills needed in the digital economy, and employers around the world are struggling to find skilled professionals equipped with the technical and soft skills they desire. In context of youth employment crisis and the job opportunities available for people equipped with digital skills, the question of skills training and improvement of entrepreneurship education therefore become central.

Referring learning methods within entrepreneurship education, Chinnoye and Akinlabi [22] affirm that this is most successful through active learning approaches such as experiential, team-based project, and problem-based approaches.

Learning the concept of global citizenship through global collaboration helps students to work cooperatively with people around the world; this is often necessary for their future jobs.

Small- and medium-sized enterprises (SMEs) are very important and numerous in Europe but small, and their resources are constrained. Because, their staffs need to adapt to digital transformation changes and learn new competences and skills relatively quickly; new learning/training opportunities for their staff have to be found, in addition to the daily operations of the company. Most entrepreneurship programs are targeted at new business owners or start-ups. There is, however, less research on the relationship between entrepreneurial skills of employees in existing SMEs, digital transformation, and innovation capacities in this context.

The European ongoing project Reinnovate with participation of the author focusses also on encouraging all employees in SMEs to develop an entrepreneurial mindset, increasing the chances of the small firm's survival within digital transformation. Project partners come from five European countries (www.iat.eu). Within the framework of the project, an intense cooperation with SMEs, research organizations, and representatives of higher education is crucial. The provision of a training program and model accreditation will assist employees in SMEs to find/create the knowledge required to become more competitive, to develop a digital culture of entrepreneurship, and to become more innovative.

Reinnovate uses results of the European project Archimedes and a survey with 150 European SMEs about their existing skills and corresponding training needs suitable also in connection with digital transformation. The methodology of Reinnovate is direct including interviews with guest entrepreneurs, recording videos, counseling, if possible, group discussions, active learning, learning from mistakes, process-oriented teaching, practical-operational teaching methods like starting a business, and role play [23].

The Reinnovate methodology should help to:

- Take into consideration the most common practices in SMEs which are informal learning and workplace learning.
- Take into consideration effective and preferred practices by employees to keep the employees moral at digital workplaces and extend their employability perspectives.
- Support the interorganizational level of workplace learning, i.e., regardless of life-cycle stages.

Four training modules will be developed and offered to SME staff, each module over the course of a 6 week period; if a learner takes all four modules, they will accumulate credits for a level 7 certificate award.

Module 1 about how to use workplace-oriented research to identify opportunities for new business includes also identifying opportunities from national and international perspective referring digital transformation, social, and cultural problems.

Module 2 has the objective to enable learners to gather and analyze the relevant data to allow them to implement a business opportunity or an innovative idea in connection with digital transformation. The module consists of three units, decision-making, gather data, and assess information.

Module 3 helps entrepreneurs to manage an own research project and module 4 to evaluate success and feature opportunities.

7. Conclusions

There is a consensus between researchers, educators, business observers, and entrepreneurs that digital transformation requires many changes, i.e., cultural and behavioral ones, and that entrepreneurship education and training could significantly increase the number and the quality of entrepreneurs working in SMEs or entering the digital economy.

This chapter has involved a review of different articles, the opinion of some practitioners, SMEs, and of the authors about how could be companies helped to solve some problems in connection with digital transformation.

Finally, it has been established that it is not easy to scale up business from a traditional small enterprise to one working successful in digital era; through new educational practices and a cooperation between educators, research, and industry entrepreneurial mindsets can be supported including behavioral changes and achieving competences like described in EntreComp and also new work-oriented research skills.

The program being developed within the Reinnovate project to develop entrepreneurial culture in SMEs through the provision of a suitable training program can contribute in this context.

The author will work further in collaboration with SMEs to make some adjustments toward transformational entrepreneurship and a sustainable socioeconomic development of SMEs in the digital era.

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Chapter

Intellectual Capital Management and Economic Development in a Quasi-Information Society

Ojinga Gideon Omiunu

Abstract

The study investigates intellectual capital management (ICM) and economic development in a quasi-information society such as Nigeria: a macro perspective. The study adopts the correlational research and secondary data were used. From a macro perspective, data used for the human capital development are literacy level, human development index, and Gini coefficient, among others. Structural capital include telecom rate to GDP, mobile cellular subscriptions, mobile cellular subscriptions (per 100 people), and Internet penetration and use rate. Also, economic development as the dependent variable represents the GDP. Data within the periods of 2005 and 2015 were used, and regression analysis and ANOVA were used to explain the relationships between variables of interest of the study. The findings showed that there was no significant increase in the development of the Nigeria economy in the periods of 2005–2015 and the ICM of the nation does not have significant impetus on the economy. The study recommends that for the level of development to increase in Nigeria, governments and policy makers should concentrate and seek strategies to provide policies that would enhance the IC of the nation such as the level of literacy, innovative research, and development, among others.

Keywords: ICM, macro ICM intervention, economic development, quasi-information society, intellectual capital management

1. Introduction

Economic development is an independent research field and of interest to nations and stakeholders of development at local and global levels. It has a long ancient origin and has been since a major point of attraction in the field of research and also in the practicality in developing economies of nations. Economic development could be said to be a multidimensional process that involves major changes in social structures, attitudes, and national institutions, acceleration of economic growth, reducing inequality, and the eradication of poverty [1, 2]. It has to be more concerned with enhancing the lives lived and the freedoms enjoyed. In the past, economic development of economies was captured from traditional perspectives as accumulation of wealth and includes macro variables such as poverty and per capita income levels, change in real GDP, and change in real GDP per capita, among others.

However, the concept has undergone various dynamics, and in the recent knowledge and information society, economic development has received ample transformation. A major transformation is the inclusion of the human development index which is a comprehensive measure of socioeconomic development into the measure of economic development [3, 4]. The development is no longer approached primarily as a process of capital accumulation but rather as a process of organizational change and transformation [5]. According to Todaro and Smith [2], the three major objectives of development include to increase the availability and widen the distribution of basic life-sustaining goods, to raise the levels and standards of living, and to expand the range of economic and social choices.

Recently, due to the dynamics of information and communication technology (ICT) innovations and the knowledge or information economy, economic development as a concept and practice has received tremendous leap and transformation. Jarboe and Alliance [6] noted that dynamics of ICT innovations and knowledge or information economy are revolutionizing the economies of nations. Also, in recent time of the information economy, productive capability is no longer completely dependent on capital and equipment but also has become a function of workers' skills, knowledge, and expertise—hence the intellectual capital of nations. This economy transformation was what made Stewart [7] to affirm that in the new information and knowledge economy, nations' economy stands on three pillars, and they include knowledge becoming what to buy, sell, and do; knowledge-based assets becoming more important to organizations and nations; and lastly, new technologies, innovations, and strategies are needed to explain the knowledge-based assets.

As information and knowledge become more important to development, organizations and nations have been restructured to better utilize human assets and the intellectual capital. Hamzah and Ismail [8] noted that intellectual capital is a major source of competitive advantage and economic development and there is evidence that success and productivity of nations can be partly explained by its intellectual capital. Intellectual capital includes the intellectual material that has been formalized, captured, and leveraged to create wealth by producing a higher-valued asset [9]. In recent modern economic development under globalization and increased competitiveness, intellectual capital is required. It is a major resource on demand, which leads to the generation of new ideas and creative approaches to existing economic processes [4].

Makarov [10] and Lukicheva [11] noted that assessing intellectual capital is a complex process because of its individual, organizational, national and global functioning among economies of nations. Many studies such as Mavridis and Kyrmizoglou [12], Ahmad and Mushraf [13], Fadaei et al. [14], Ogbo et al. [15], Saeed et al. [16], and Rehman et al. [17], among others, have tend to approach intellectual capital from the micro level. However, few studies have given attention to intellectual capital from the macro and economy level. From the micro level which holds the individual and organizational view, intellectual capital management can be grouped into three components; these include human, structural, and customer capital. According to Fadaei et al. [14], human capital is all the abilities that include attitude, skill, knowledge, creativity, existing mental knowledge, and people and managers' experience of an organization. Structural capital includes the events and interactions among people in the organization and what remains in organization when people leave it. Customer capital also known as the relational capital refers to all the formal and informal relations of an organization with external beneficiaries and their understandings about organization and also exchange of information between them and the organization.

At the macro level, human development index which is a major development in intellectual capital measurement has an ultra-integral character. Konovalova et al.

[4] noted that there are three indicators of national population life quality that are summed up in human development index and include welfare level, expressed in figures per capita income; health level, expressed in life expectancy rate; and education level, measured by the literacy level and the share of young people that are getting higher education in higher education institutions. In summary, measuring human development index cuts across the economic, environmental, and cultural factors of people life.

From the studies of Levashov and Rutkevieh [18] and Konovalova et al. [4], the macro level of intellectual capital management was broken down into its micro constituents. The human capital covers the educational and social well-being potential indicators. Structural capital caters for the indicators of scientific potential and the indicators of information and communication components. Consumer capital captures the indicators of relationship capital. Due to lack of data access at the macro level on the relational capital components, only the components of the human and structural capital would be considered for this study. Adapting the work of Konovalova et al. [4], literacy level, human development index, Gini coefficient, unemployment rate, poverty rate, and growth rate would be used to capture the human capital development indices. For the structural capital, telecom rate to GDP, mobile cellular subscriptions, mobile cellular subscriptions (per 100 people), and Internet penetration and use rate would be used. The GDP would stand as the dependent variable of the study which signifies economy development of the nation. These variables used to capture intellectual capital management at the macro level are based on the work of Konovalova et al. [4] that intellectual capital is developed in two ways: education which is the skilled personnel training and involvement of foreign specialists.

The need to focus on quasi-information society is hinged on the fact that development of economy changes with transformation of the society and this differs across nations. According to the Lewis model of development [19], at the lowest level of development, traditional or unskilled labor is surplus while skilled labor is few. According to Rostow's model of development [20], different countries are at different stages of development. The need to close the wide gap and development dividing between developed and developing countries made the General Assembly of the United Nations in September 2015 to adopt the 2030 Agenda for Sustainable Development and developed a 17 Sustainable Development Goals (SDGs) agenda to drive equal development. Built upon the principle of "leaving no nation behind," the SDGs include reducing poverty, reducing hunger, ensuring good health and well-being, quality education, gender equality, providing clean water and sanitation, affordable and clean energy, ensuring a decent work and economic growth, industry, innovation and infrastructure, reduced inequality, providing sustainable cities and communities, responsible consumption and production, climate action, enhancing life below water, life on land, peace and justice strong institutions, and partnerships to achieve the goal. From broader and global perspectives, education is the pivot on which other SDGs' attainment rests. It operates twofold aspects in the development of nation toward attaining SDGs: first, it is seen as a goal in itself, and second, it is also a means for attaining all the other SDGs [21–23]. Thus, it is an integral part of sustainable development of nations as well as a major enabler for the attainment of other SDGs. A better and improved education system could have positive impact on the development and hence on the attainment of SDGs in Africa such as Nigeria. Shettima [24] noted that Africa which includes Nigeria plays important aspect in SDGs' attainment. This is because success in attainment of the SDGs can be achieved if and only if the SDGs succeed in Africa due to the wide gap and development divide that occur between developed and developing countries such as Africa which Nigeria is part.

Meanwhile juxtaposing the Lewis and Rostow models, the reason for the disparities between the developed and developing economies is not farfetched. In the developed economies such as the UK, the USA, Canada, Japan, and China, among others, the development has elastically reached every nook and cranny of their economies, and development activities are controlled by the information economy. However, in developing countries such as Nigeria, there may still be a high level of underdevelopment, and if at all the nation is developed, it is skewed: while some areas experienced the development syndrome, other areas are lagging behind development. This fact is supported by the studies of Blanchfield and Lawson [25], Easterly [26], and Global Monitoring Report by the International Bank for Reconstruction and Development, the World Bank [45], that African countries which include Nigeria experienced setback and failure in the attainment of major development strategies such as the Millennium Development Goals (MDGs).

This is because most developing economies are experiencing a quasi-information society. A quasi-information society refers to a false information society that has the likeliness and the form of information society but does not fully rely on information for their growth and development due to lack of skills and infrastructural challenges. According to Becla [27], quasi-information society occurs because of lack of accessibility, availability and use of ICTs, high transaction costs, low skill and literacy level, and lack of mechanism for quick diffusion and dissemination and use of information. A clear observation of the major problems experienced in Nigeria with respect to the information and knowledge economy shows that Nigeria operates a quasi-information society. In such information society, intellectual capital management could be hampered, thereby affecting the economic activities and development of the nation. In some economies such as the developed economies, where the society is a pure information economy, the intellectual capital management could be high and higher than those of the quasi-information society. This could also create an impetus on the economic activities and development of the nations.

According to Harrod-Domar growth model, output which in this study is economic development is a function of capital. The concept of capital has received a new approach in the information and knowledge economy. In the past and traditional era and in managerial economics, capital was referred to as credit or money and is known to be a factor of production alongside labor and land. However, in recent times, the elasticity of capital has extended beyond this and has included intellectual capital. Therefore, complexity could be noticed with the concept of "capital" especially in the present information and knowledge economy. This made Nitzan [28] to affirm that the concept of capital remains ambiguous and controversial. However Barman [29] noted that a distinction needs to be drawn between the traditional and information- or knowledge-related capital. Hence, going by Harrod-Domar growth model, economic development is a function of nations' intellectual capital management. This is the basis of this study. Hence, the main objective of this study is to investigate the relationship between intellectual capital management and economic development of Nigeria: a quasi-information society.

2. Previous studies

Economic development has received great attention from scholars, governments, policy makers, and other stakeholders of the development of nations. According to Robbins [30], the essence of economic development is conceived as

the rupture of existing patterns of economic relationships—which could emanate from the normal circular flow of statistical analysis. Feldman et al. [31] noted that economic development is often confused with the more easily measured economic growth. Kwong [3] defined economic growth as simply a rise in GDP or GDP per capital, while economic development is encompassing and is a broad concept which economic growth is just a part. Other important developmental dimensions or indices are included in the definition of economic development. Schafer [1] defined economic development as a dynamic process over time, and it makes good sense to employ tools of dynamic macroeconomics.

In a more generalized form, Todaro and Smith [2] defined economic development as a multidimensional process which encompassed major transformations in social structure, popular and important attitudes, and national institutions, as well as the acceleration of economic growth, the reduction of inequality, and the eradication of poverty. From this, it could be observed that economy can be growing but it is not developing. Other economic development indices are human development index, poverty, and literacy level, among others. To this end, Mackintosh et al. [32] argued that it is very possible for the HDI of nations to decline while the measure of GDP increases. They further noted that this scenario is common among developing economies which Nigeria is a part.

This is because, according to Brown [33], in Keynesian economics, individuals, organizations, and institutions at the micro level cannot increase their productivity but need government interventions. These government interventions may include adopting discretionary economic policy which requires that governments make policy changes on the basis of its judgment of the current and future economic circumstances of the nation. Hence, the government is seen as a major agent for economic development and transformation. Also, such policies should address and be targeted toward the interest of the public at the micro level which could create impetus at the macro level. This is because according to Keynesian economics, the aggregate of the micro level determines the economic development indices at the macro level. However, Jarboe and Alliance [6] stated that economic development strategies and practice must adapt to new economic landscape such as intellectual capital management of the nation.

The importance of intellectual capital (IC) has greatly increased in recent times due to the major shift of economies toward the knowledge- or information-driven society [17]. Previous studies on the relationship between intellectual capital management and performance such as Boedker et al. [34], Subramaniam and Youndt [35], Bramhandkar et al. [36], Asiaei and Jusoh [37], and [17], among others, have approached it from the micro level using the individual and organizational acquired data to explain their relationships. However, in recent information economy and society era, attention needs to be drawn to the macro importance of intellectual capital management to nation's economy. Very few studies have addressed this and such study is lacking in developing nations study.

In recent information and knowledge economy, the value of any country is a function of their knowledge and intellectual capital [38]. Marcin [39] and Rusu-Tanasa [40] noted that intellectual capital is a major key factor of socioeconomic development of regions and countries. Mercier-Laurent [41] in trying to investigate intellectual capital management and the economy revealed that the focus on intellectual capital in any economy is due to the fact that it is the root of all organizations' activities which are directly contributors to the nation's economy or GDP. Pachura [42] noted that it aids structural and economic transformation in any nation. Hence, Makarov [43] has opined that intellectual capital is a major indicator of sustainable development of any country.

However, due to intangible nature, its effect on the economy has not been given much attention in developing countries. Intellectual capital forms the basis of the

success of the development of countries which calls for the right way of managing the intangible wealth and assets such as the intellectual capital in connection with the tangible ones [41]. Earlier scholars such as Schultz [44] and Becker [45] have noted the effect of education, training, and literacy level which are important intellectual capital indices on economic development of any nation. Drucker [46] pointed out that knowledge which is a constituent of intellectual capital is a primary resource and capital for overall economic development having higher value than the traditional land, capital, and labor in the development of economies. Hence, there have been global attention especially among the developed nations on the role of intellectual capital productivity growth and competitiveness and consequently in its contribution to the sustainable long-term economic development of nation [41]. Also, Mercier-Laurent [41] has also noted that communication technology and innovations are also major intellectual capital that could influence economic development of nations.

Despite the significant value of intellectual capital on the development at the macro level, measuring IC could lead to confusion. This is because most of the studies have addressed it as and at a micro level and at the macro level; its measurement becomes a challenge. According to Makarov [43] and Konovalova et al. [4], at the macro level, national population life quality variables such as the human development index which is captured by welfare level, expressed in figures per capita income, health level expressed in life expectancy rate, and education level, measured by the literacy level and the share of young people that are getting higher education in higher education institutions, among others, are major macro indices for measuring intellectual capital of any nation. Hence, this present study adapts these variables to capture the intellectual capital management at macro level and its effect on the Nigeria economy using the gross domestic product of the nation.

In addition, a major novelty in this study is its link with the failure in the attainment of the past MDGs and with the likelihood of success or failure of the attainment of the recent SDGs in Nigeria. It has been proven beyond measure that Africa has experienced a perfect elastic setbacks and failures in the attainment of global development strategies, the Millennium Development Goals (MDGs), not excluded ([25, 26, 47]). However, recently, the General Assembly of the United Nations in September 2015 adopted the 2030 Agenda for Sustainable Development and developed a 17 Sustainable Development Goals (SDGs) agenda to drive equal development. From the SDGs, education is the pivot on which sustainable development rests, and it is also the pivot of the ICM of the country. To this end, if Nigeria must have success in the attainment of the SDGs, there is need to draw attention and reposition its ICM system within the center of quality education. Hence, this study focuses and tends to establish the relationship between ICM and economic development toward driving the attainment of SDGs in Nigeria.

3. Methodology

The study adopts the correlational research and secondary data were used. Adapting and juxtaposing the Lewis model of development [19] and Rostow's model of development [20], different countries are at different stages of development, and the lowest level of development is the traditional level where there is a high elasticity of unskilled labor. At the lowest level of development, factors of importance seem to fit into the traditional system, while above the lowest levels, considerations of factors are used as major developmental indices change. According to Harrod-Domar growth model, output which in this study is economic development is a function of capital [48]. The concept "capital has been

said to be subjective especially in recent times of information economy [28, 29]. In the past, emphasis was drawn to agrarian development, population increase, available of credit, agricultural labor, poverty level, etc. However, in recent times, there has been transformation and extension of this variables of interest. Transformation in the sense that some may remain unchanged while others undergo transformation. With regards to extension, other important variables were added to suit the developmental stages of nations. In recent global development, Makarov [43] and Konovalova et al. [4], among others, have argued the place of intellectual capital management on the development and include variables such as human development index which is captured by welfare level, expressed in figures per capita income, and education level, measured by the literacy level and the share of young people that are getting higher education in higher education institutions, among others. However, there is need to see this in the Nigerian economy, hence, the need for this study.

Due to the lack of access to important data, the data employed in this study include the literacy level, human development index, Gini coefficient, unemployment rate, poverty rate, and growth rate which capture the human capital development indices. For the structural capital, telecom rate to GDP, mobile cellular subscriptions, mobile cellular subscriptions (per 100 people), and Internet penetration and use rate would be used. Also, the GDP stands as the dependent variable of the study which signifies economy development of the nation. Data within the periods of 2005 and 2015 were used so as to obtain an equal number of substantial information to use for the study and were provided in **Table 1**. The study used the regression analysis and ANOVA as its data analysis method to explain the relationships between variables of interest of the study.

The model specification is provided below:

$$Y = \beta_0 + X_1\beta_1 + X_2\beta_2 + X_3\beta_3 + X_n\beta_n + e_i \quad (1)$$

where X_s are the independent variables of the study which is used to capture intellectual capital management in Nigeria, B_s represents the coefficients of X_s and represents the significant changes of Y (dependent variable) with increase in one unit of X_s, and e_i represents the error term.

4. Results

A keen observation on the information on **Table 1** shows that there is no substantial increase in the human development index (HDI) of Nigeria. There is however an increase in mobile subscription from 13.4 and steadily grows to 83.2% in 2015 in Nigeria economy. The same was applicable in the mobile phone subscription per 100 people data. The result shows that there was no significant growth in the nations' Gini coefficient but there was a stochastic and haphazard movement of the development. Also, there was no substantial growth rate in the Nigeria economy. There was also no significant reduction in the nations' poverty rate, and there was a stochastic and haphazard movement of poverty rate. The increase level of unemployment rate in Nigeria economy is a major concern on **Table 1**; it could be evident that unemployment rate increases drastically from one digit to two digits from 2005 to 2015. Also, literacy level reduced from 2005 to 2015, and this also constitutes a major concern on **Table 1**. Also, there was a substantial increase of Internet use rate in the Nigeria economy from 2005 to 2015. In addition, the rate of telecommunication contribution to the Nigeria economy is very infinitesimal, and no increase is felt in this sector. Furthermore, Nigeria economy also recorded a substantial growth

Year	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	Y (in billion naira)
2005	0.466	13.4	13.38	0.4882	6.51	58.2	2.9	67.7	3.5	0.05	22,269.98
2006	0.477	22.7	22.66	0.457	6.03	58.5	5.8	78.6	5.5	0.06	28,662.47
2007	0.481	27.6	27.59	0.429	6.50	59.3	4.9	64.9	6.8	0.07	32,995.38
2008	0.487	41.9	41.90	0.513	6.41	62.4	5.8	51.1	15.9	0.08	39,157.88
2009	0.492	48.3	48.26	0.43	7.0	65.2	11.8	51.1	20.0	0.10	44,285.56
2010	0.500	55.1	55.05	0.447	6.7	69.0	22.0	56.9	24.0	0.11	54,612.26
2011	0.507	58.4	58.43	0.405	6.9	60.0	24.0	51.1	28.4	0.10	62,980.40
2012	0.514	67.4	67.41	0.362	7.2	35.2	27.0	51.1	32.8	0.10	71,713.94
2013	0.521	74.1	74.05	0.41	6.4	33.1	25.0	55.2	38.0	0.10	80,092.56
2014	0.526	78.7	78.75	0.399	6.3	60.0	24.0	59.2	42.7	0.11	89,043.62
2015	0.527	83.2	83.25	0.387	2.8	60.0	29.0	59.6	45.1	0.12	94,144.96

Source: sourced and compiled by the author from various secondary sources such as the CBN, World Bank, National Bureau of Statistics, Internet World Stats, and Internet Live Stats, among others.
Note: X1 represents human development index; X2 represents mobile cellular subscriptions; X3 represents mobile cellular subscriptions per 100 people; X4 represents Gini coefficient; X5 represents growth rate; X6 represents poverty rate; X7 represents unemployment rate; X8 represents literacy level; X9 represents Internet use rate; X10 represents telecom rate to GDP; Y represents the GDP.
Also, some of these data sets at one period or the other were found to be missing, and in order to cater for these missing value, the author used a mean strategy between the lower and upper period to obtain the middle data. At some other time, the author simply used the previous year data where applicable.

Table 1.
Selected macro intellectual capital indices and national GDP of Nigeria.

in its GDP. Despite the growth in the GDP of Nigeria, the information in **Table 1** shows that there was no significant development in major intellectual capital indices of the Nigeria economy in the periods of 2005 to 2015.

The result of the regression analysis was provided in **Table 2**. From the result, the adjusted R square for the regression analysis was 0.99, which shows a better goodness of fit of the model.

From **Table 2**, the results shows that, of all the variables of interest in this study used to represent intellectual capital at the macro level, none was found to be significant ($p > 0.05$). Also, from the beta coefficients of the independent variables, most of the coefficients were negative (mobile subscription per 100 people, Gini coefficient, growth rate, poverty rate, unemployment rate, and literacy rate). Only few had negative coefficients such as human development index (HDI), Internet use rate, and telecom rate to GDP. Also, the model deleted the mobile subscription data because of high level of collinearity between mobile subscription and mobile subscription per 100 people. A keen observation on this result shows the low standard of these indices in Nigeria. Even though Nigeria is developing and recorded substantial increase in some of these indices, its effect on the economy is not felt. Also, the result also shows the quasi-information society level of the nation as the rate of telecom increases and other intellectual capital developments have not create a substantial impetus on the economy. The result of the study depicts that though the nation is big, it has little or no internal economic indices that would create impetus to the nation development. The joint effect of the intellectual capital management on the nation's GDP is provided in **Table 3**.

Coefficients					
Model	**Unstandardized coefficients**		**Standardized coefficients**	**t**	**Sig.**
	B	**Std. error**	**Beta**		
Constant	−460044.760	473238.599		−0.972	0.509
HDI	1075564.924	1023024.189	0.899	1.051	0.484
Mobile subscription per 100 people	−831.564	1616.293	−0.782	−0.514	0.697
Gini coefficient	−8766.881	54633.128	−0.016	−0.160	0.899
Growth rate	−1324.654	1204.995	−0.063	−1.099	0.470
Poverty rate	−33.921	275.659	−0.016	−0.123	0.922
Unemployment rate	−56.848	450.897	−0.023	−0.126	0.920
Literacy rate	−13.369	235.757	−0.005	−0.057	0.964
Internet use rate	1357.304	920.721	0.810	1.474	0.379
Telecom rate to GDP	57605.621	513440.948	0.052	0.112	0.929

Dependent variable: GDP.
Source: Secondary data analysis, 2018.

Table 2.
Regression analysis result.

ANOVA[b]						
Model		**Sum of squares**	**df**	**Mean square**	**F**	**Sig.**
1	Regression	6.252E9	9	6.946E8	99.325	0.078[a]
	Residual	6993498.081	1	6993498.081		
	Total	6.259E9	10			

[a]*Predictors: (constant), telecom rate to GDP, poverty rate, growth rate, literacy rate, Gini coefficient, unemployment rate, Internet use rate, HDI, mobile phone subscription per 100 people.*
[b]*Dependent variable: GDP.*

Table 3.
Joint effect of the intellectual capital management on the nation's GDP.

The result in **Table 3** shows that the impetus of intellectual capital management is not felt on the nation's GDP. This provides a challenging situation in the nation which needs to be given attention when development at the global level is put into consideration. In the recent global information economy or society, intellectual capital should have tremendous effect on the economy; however, the case of Nigeria is different.

5. Discussions of findings

The findings of this study support the work of Mackintosh et al. [32] that it is very possible for the HDI of nations to decline while the measure of GDP increases, which is a most common phenomenon of developing countries such as Nigeria. Also, if according to Hoff and Stiglitz [5], Jarboe and Alliance [6], Stewart [7],

Hamzah and Ismail [8], and Konovalova et al. [4] that the development of nations has moved from the traditional economic indices such as population growth, GDP, etc. to the intellectual capital and the information economy contribution to GDP, it is evident that Nigeria is not developing. Also, going by the well-known Lewis model of development, if literacy level has not had impetus on the economic growth of Nigeria, it is then a fact that most of the population of Nigeria still operate at the lowest level of development where there is a high unskilled labor and low skilled labor. Hence, going by the work of Becla [27], and the result of this study, Nigeria is a quasi-information society due to the fact that the major intellectual capital indices used in the study have not transformed into economic growth and development. This could also transcend to major sectors of the economy hence affecting their development and economic activities in the nation. This could further lead to threaten the development and sustainable development of the sectors and in extension of the economy in the long run.

Also, going by the work of Edvinsson and Bounfour [38], Nigeria would be said to have a lower value at the global development levels because of the fact that its intellectual capital has not create an impetus on the economic development. Hence, the development in Nigeria is questionable as confirmed by the work of Mercier-Laurent [41], and there may be no structural and economic development as affirmed by Pachura [42], and hence, the sustainability of the economy would be a major problem as attested by Makarov [43]. Consequently, one could say that the future of the nation is questionable and needs urgent attention if it must develop and survive in the recent global information economy and society and transformation.

6. Conclusion and recommendations

In conclusion, in Nigeria economy, intellectual capital management has not created an impetus on the economy of the nation; hence, it is operating in a quasi-information economy (false information economy). In addition, this could constitute a major challenge against the development of the nation and also the development of major sectors of the economy. This could be one of the major reasons for the setbacks and failures in the attainment of major development strategies such as the Millennium Development Goals (MDGs). Also, the practical relevance of this study is to show that, if the ICM of the nation is not given wide recognition and repositioned and developed toward enhancing quality education in Nigeria, there is a high propensity that Nigeria will eventually experience failure and setbacks in the attainment of recent SDGs, hence, lagging behind neighboring developing countries and developed countries who put into recognition and positioned their ICM for development. To this end, the study recommends that:

i. If Nigeria must rise above the present level of development and meet up with global development indices, there is need for the governments and policy makers to concentrate and seek strategies to provide policies that would enhance the intellectual capital of the nation such as the human development index, level of educational development, and level of literacy and unemployment, among others.

ii. Also, attention should be drawn to the need to increase budget allocation to intellectual capital development of the nation and also to its major actors such as skilled workers in the primary, secondary, and tertiary education system, research and development institutes, and other organizations committed to research and education activities in the nation.

iii. The governments and other providers of development programs should deem it fit to see to it that major programs provided to the nation have significant impact on the nation and its development. To this end, there should be need for periodical review and assessments of such major programs to see how effective they are to the economy.

iv. Also, innovative policies addressing users' needs that could create substantial impetus of the telecom industry on the Nigeria economy should be introduced and provided so that the nation could enjoy the benefits of this sector with respect to development.

v. There should also be the need to increase employment in the nation, and the governments should encourage and provide access to business development and a better environment for both local and foreign investors in the Nigeria economy.

vi. To this end, special consideration should be given to the intellectual capital management of nations at macro level and hence should attract future research which could capture more variables of the ICM to observe how it has affected the attainment of SDGs in Nigeria. Also, other African countries can also embark on such research focus; hence, this could help Africa such as Nigeria to reposition their ICM for attainment of development strategies such as future SDGs.

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Chapter

Big Data and Strategy: Theoretical Foundations and New Opportunities

Mattew J. Mazzei and David Noble

Abstract

The digitization of products, processes, and business models—and the corresponding explosion of big data—has led to an evolution within business organizations. Reaching far beyond information technology's traditional role in business strategy, the implications of this big data phenomenon are considered through an exploration into what big data is, how it is currently being used by existing firms, and how it factors into strategic thinking. As different organizational approaches have developed toward big data, we use resource-based theory and organizational learning as anchoring perspectives to link this phenomenon with traditional strategic management. We also identify four avenues for future scholarship as the nature of business moves increasingly digital.

Keywords: big data, strategy, theory, resource-based view, organizational learning

1. Introduction

The global digitization of products, processes, and business models is reshaping the very nature of business. Entire industries are rapidly evolving as more firms take advantage of increases in clicks, sensors, and technological innovation. Due to advancing technological infrastructure and the advent of the so-called "Internet of Things," companies continue to innovate, finding new ways to capture and leverage ever-expanding amounts of data. With storage costs becoming increasingly affordable and the lure of new (or fear of missed) opportunities, more and more firms are integrating information technology (IT) planning into their strategic thinking.

Given these advances, firms are increasingly aware that every person (or device) is a potential *data generator*. Consumers leave an extensive digital trail as they go about their daily lives. Whether shopping for groceries or fashion, traveling on a daily commute, or mulling around in their own home, individuals' activities are generating consumable data. Connected devices are also doing more to communicate with one another, including the tracking and transfer of data to value chain partners.

In a similar manner, organizations have become *information processors*. They are making considerable investments into analytic capabilities and data science talent to exploit opportunities presented by digitization, seeking to create or capture value and develop competitive advantage. In secrecy or in plain sight, organizations are working diligently to obtain consumer data and attempting to interpret and apply it to their strategic decision making [1].

The concept of "big data"—large data volumes generated and made available on the internet and through current digital media ecosystems [2]—has heralded increasing attention as having important implications for growth, profitability, and survival. Strategy theorists and practitioners alike are currently struggling to understand big data's role in the digitization of business models and how big data initiatives influence functional decisions within organizations, shape entirely new markets, and establish unique new strategies for organizations that break down traditional barriers of existing industries [3].

Executives across a multitude of industries are plunging resources into big data projects with aims to better monitor, measure, and manage their businesses. These strategic leaders are leveraging information to exploit current markets with incremental innovations that influence marketing efforts, product selection, and operational processes. Yet a small number of organizations employ a different role for data within their strategic approach. These firms recognize that information is at the core of most modern radical innovations [4]; their approach is resulting in the unforeseen entry into existing market spaces using innovative business models, the creation of new markets, and the invalidation of long-standing assumptions in traditional strategic thinking.

Scholars in the field of strategic management have an opportunity to play a major role in developing an understanding of how the emergence of big data is changing the nature of competition. Though the conversation has begun, management scholars have yet to build theory around the role of big data in the world of modern day corporate- and business-level strategy. As noted in recent research, big data has the promise of bringing new theories and practices to the organizational sciences, and is likely to play a central role in the development of new strategic approaches to firm governance and leadership [5]. We add to this promising literature through an integrative perspective of familiar organizational theories while triggering broader discussions for management research.

We identify theoretical foundations necessary for an examination of the emergence of big data in strategic decision making through the lenses of resource-based theory (RBT) and organizational learning. Informed by common characteristics used to conceptualize big data, this framework focuses on different applications of big data depending upon management's aspirations as well as the development and maturity of their organization's infrastructure and capabilities (authenticity). The result of such an approach is the realization that the field of strategy needs to be flexible enough to accommodate a new understanding of the interplay among data, technology, and strategy. As the economy turns increasingly digital, scholarship must adapt to better explain new and unique phenomena of interest.

The primary objective for this work is to stimulate the research agenda surrounding the integration of big data and corporate strategy. We aim to engage a broad variety of management scholars via our contributions, spurring on new theories and models to describe the disruption of value chains, supporting the development and reconceptualization of successful outcomes in business, and orchestrating linkages between business analytics methodologies and strategy scholarship methods. While setting forth a theoretically grounded framework that will allow strategy researchers to begin tackling important questions in the field, we introduce components of the discussion that are heretofore absent in the management literature and offer numerous avenues for future scholarship.

2. Background

The term "big data" is used to describe large, diverse, complex, and/or longitudinal datasets generated from a variety of instruments, sensors, and/or

computer-based transactions [6]. Big data applies to huge troves of raw data (structured, semi-structured, and unstructured) that cannot be processed or analyzed using traditional methods or tools, leading to increasing challenges in how value is to be extracted [7]. Though the origination of the term is still muddled and under debate, the concept of big data has become a topic of great interest, often under the assumption that it serves as a potential source for competitive advantage in many industries [8].

To understand the evolution leading to the current era of big data, the foundation lies in the development of database management and warehousing [9]. Collecting and storing mostly structured data in relational database management systems was increasingly employed by organizations in the 1990s, with data mining techniques and basic statistical analyses applied as a means to gain insight into growing volumes of information. As the Internet gained prominence and widespread use, more data collection and analytical research and development opportunities were created, with new challenges of text and web analytics for unstructured web content moving to the forefront [3, 9]. Social media forums, web logs, social networking sites, and clickstream data logs created the means for businesses to treat the market as a "conversation" between businesses and customers instead of the traditional business-to-customer, one-way "marketing" [10]. The increasing number of mobile connected devices and other sensor-based, Internet-enabled gadgets are pushing analytical capabilities even further, trapping organizations in a race to adapt to the challenges in collecting, processing, analyzing, and visualizing such large-scale and fluid mobile and sensor data [9]. The compilation and advancement of these technological innovations are increasing organizational competencies, defining new sources of competitive advantage, transforming business models, and opening new windows of entrepreneurial opportunity.

Under the promise of innovation and operational efficiency, big data investments have exploded at major corporations. With McKinsey Global Institute [11] predicting significant benefits to individual industries (e.g., a $300 billion annual impact to the U.S. healthcare industry alone, 60 percent increases in operating margin for U.S. retailers), a considerable and consistent flow of resources into big data projects is expected to continue in the coming decade. Despite noted challenges facing firms with regard to technological advances [12]—or perhaps because of them—a thriving industry has emerged that specializes in the capture, storage, analysis, and interpretation of big data. Niche firms are building platforms and proprietary software to serve clients in both public and private sectors, offering analytic tools and capabilities unable to be matched in-house. Also of note, data-related research centers are springing up at universities across the globe. Nine figure investments in data science programs are becoming commonplace as universities seek new knowledge and aim to produce students with skills sought by an increasing number of organizations. To date, much of the knowledge of the big data phenomenon has been derived by data scientists in both corporate and academic environments through an exploration of essential big data attributes, which have come to be known as the "Vs" of big data.

2.1 The "Vs" of big data

Early conceptualizations of big data were built around three central characteristics: volume, velocity, and variety [13]. *Volume* represents the "big" in big data. The sheer volume of data is exploding, with some organizations collecting as much as a terabyte of data each and every hour, every single day [7]. With societal trends toward social media and remarkable advancements in technology, partnered with decreasing storage costs that have made it more economically feasible to manage, data volume is likely to continue rising. The second core element, *velocity*, deals

with the rate at which the data arrives, is stored, and retrieved for processing. With more sensors available, the growing introduction of connected devices, and an ever-rising number of codified transactions occurring globally, we are seeing increasing speed in data flow [14]. With technological advancements allowing for the tracking of data in a multitude of mediums, we are also seeing changes in the *variety* of the data. Beyond traditional numeric data, we are now seeing raw, semi-structured, and unstructured data sourced from web pages, web log files, search indexes, social media forums, email, documents, sensor data, images, video footage, GPS signals, and many other outlets [7, 15].

As the big data phenomenon has evolved to include the identification of additional characteristics of consequence, researchers have suggested several more "Vs" as fundamental to the discussion. There is growing consensus to include the *veracity* of data as a relevant characteristic. Veracity relates to data quality [6, 8], with some segregating data quality into separate dimensions for timeliness, accuracy, consistency, and completeness [16]. Others have distinguished consistency as its own characteristic, choosing to deal with the changing nature of data as an issue of *variability* [17]. In this light, the definition or meaning of data is changing, as evolving forms of media (e.g., blogs, social media, and video) have created new challenges in collecting, codifying, and storing unstructured data.

In a similar notion, some have argued that the relevance of data is another important factor. Such relevance, or *viability*, concerns the possibility of the data to be analyzed in a manner to make it decision-relevant for the firm, i.e., that data selected for analysis is likely to predict outcomes of consequence to the organization [18, 19]. Similarly, *visualization* also has been brought forth and defined as a potentially significant characteristic. Visualization refers to making data comprehensible in a manner that is easily understandable [17].

A final element that is receiving increasing attention, and proves most interesting from a strategic perspective, is the *value* of big data [6, 17, 20]. In essence, this factor is about how data can be leveraged for benefit in the form of financial gain or some other outcome of organizational import, such as operational efficiency or knowledge creation. The propensity of certain data to be used in solving operational challenges and increasing effectiveness of an organization significantly impacts its value to the focal firm. Though, while proprietary data may in and of itself provide value (for consumption or to be sold), the interaction with analytical tools and capabilities allows data to become increasingly useful and valuable [21]. **Table 1** summarizes these eight common Vs described in the big data literature.

Though these individual elements are still being disputed as to their specific validity, there is little debate as to the growing influence big data is having on and

Attribute	*Description*
Volume	Massive amount of data collected
Velocity	Rate at which data arrives, is stored, and retrieved for processing
Variety	Diverse structure and forms of data
Veracity	Trustworthiness of data
Variability	Changing nature of data
Viability	Relevance of the data
Visualization	Comprehensibility of data
Value	Data translated into learning, knowledge creation, and/or economic gain

Table 1.
Eight common Vs of big data.

within organizations today. Ubiquitous conversation and escalating investments signal the current and future importance of big data in shaping strategic thought and direction in organizations [22].

2.2 The evolving influence of big data on corporate strategy

Nearly every industry has made or is making substantial investments in big data. Despite this increasing emphasis, corporate decision makers are often left disconnected from the exact value proposition from big data investments in their strategic decision making. As such, the role of technology, data, information, and knowledge officers in corporate strategic decisions continues to evolve [23, 24]. Standards and best practices have not yet been formed, leading decision-makers to seek guidance wherever possible.

Though data-driven business models are still evolving and somewhat unproven, research suggests that IT capabilities positively influence firm performance [25]. More specific to our line of inquiry, a recent study found that organizations that claim to have achieved a competitive advantage through their data analytic capabilities are over two times more likely to substantially outperform their industry peers [26]. This same study determined that top performing firms were twice as likely to use insights gleaned from big data analytics to guide day-to-day operations and twice as likely to use analytics to guide future strategies.

Such findings would suggest that firms might take different approaches to their big data strategies and seek value through different means and ends [27]. Many, likely most, firms in the new digital economy are currently focused on solving traditional problems in traditional markets with new and creative solutions using big data analytics. These firms are seeking innovations to improve day-to-day decision-making, drawing technology resources out of a centralized IT department and distributing them throughout other value chain functions [28]. Marketing, procurement, inventory management, operations, and customer service operate more efficiently and effectively through various product and process innovations, all driven by information generated by big data investments. As an example, retail companies are utilizing digitized marketing analytics to deliver more effective advertising, incremental product improvements, and increasing rates of customer acquisition and retention. Similar improvements are being made in nearly every industry.

Scholarly works, practitioner manuscripts, and private sector whitepapers describe an evolving competitive landscape and would also suggest that another subset of firms has emerged [11, 27, 29, 30]. These organizations have adopted a data-driven, information-centric focus that subsumes all aspects and decisions for their firm, including measuring how successful certain projects are beyond profitability. Such emphasis has allowed these firms to build extraordinary data stocks and data flows. Access to inordinate amounts of data increases opportunities for learning, transforming new knowledge and ideas into fresh opportunities for exploration, often outside traditional markets. These learning organizations build ecosystems with constantly increasing data flows, developing advanced technical and analytic capabilities and tools along the way, which can be leveraged as they compete with traditional competitors and diversify into new markets.

3. Theoretical foundations

As major corporations, hedge funds, and entrepreneurs are struggling with the emergence of big data, academicians continue working to understand its role in business, the inputs and outputs of big data, and how big data projects are best

executed. While active research streams have developed in the information systems (e.g., [31]) and supply chain (e.g., [16]) literatures, there has been a paucity of contributions from the management field [5], and more specifically the field of strategic management. Most contributions to date have been through consulting white papers (e.g., McKinsey, Oracle, and EY) and practitioner-oriented outlets (e.g., [15, 30]). Hence, there is a need for strategy scholars to develop theoretical approaches to better comprehend how big data is shaping strategic decision making and at the core of novel business models that challenge traditional strategic conceptualizations.

Drawing upon the influential Vs of big data vernacular, we move to ground the big data phenomenon in accepted strategic management theory. Recognizing current practices by a wide variety of firms, we arrive at two long-standing theoretical lenses: RBT and organizational learning. Witnessing a vast majority of organizations employing analytics within functional areas of their firm in an effort to achieve sustainable competitive advantage, we draw upon RBT. Noting the organizational philosophies adopted by the minority of firms with truly advanced analytic capabilities, we also recognize the contributions of the organizational learning perspective.

3.1 Resource-based theory and the big data phenomenon

Much of the practitioner-based literature focuses on increasing efficiency and effectiveness in existing markets, and is therefore best viewed through the lens of RBT. Following traditional RBT principles—and with an assumption of resource heterogeneity across competitors—a firm's data stocks (in particular, their proprietary data stocks) are conceptualized as being valuable, rare, difficult to imitate, and nonsubstitutable (i.e., VRIN), and therefore a potential source of advantage relative to competitors [8, 32, 33]. More compelling to RBT arguments are the ability of firms to bundle data resources with analytic capabilities and strategic decision making. The significance of data increases immensely when combined with the dynamic capabilities of a firm that maximize its ability to extract and apply knowledge and insight from the data to the exploitation of business models [34].

Consistent with traditional tenets of RBT, mounting research into opportunities presented through big data initiatives in most every sector would seem to imply considerable value potential [11]. Market conditions exist for the buying and selling of data as well as analytical services, signaling a more definitive value [35]. Further, the proprietary nature of any data stocks or capabilities would suggest a level of rareness. Firms without similar capabilities or infrastructure might also find it extremely costly and difficult to imitate. Finally, empirical research into the linkage between big data, IT capabilities, and firm performance (e.g., [26]) would seem to infer that a reliance on instinctual decision making is no longer substitutable for data-driven strategic and operational planning.

Given the above characteristics, big data and the complementary capabilities associated with handling, analyzing, and applying massive amounts of data can serve as a means for achieving and sustaining competitive advantage. Managers at a significant number of firms are making investments in capabilities that allow them to use big data to generate deeper business insights and optimize existing processes. These firms are typically focused on creating and exploiting advantages in current markets, seeking resolution to traditional problems that have plagued their operations in the quest for profitability. For example, Capital One has used big data to better evaluate consumer spending patterns and connect with individualized consumer needs. Their efforts have led to new customized programming, while also helping to manage repayment risk [36]. Similarly, Progressive Insurance has

improved its ability to identify hazardous driving behavior through the use of real-time analytics derived from in-vehicle telecommunications devices [37]. Seeking similar knowledge advances, Coca-Cola has used big data to improve supply chain and innovation. Using Freestyle fountain platforms, the company captures data on geographic and time-related consumption, innovative new flavor mixtures, and inventory replenishment [38].

Through these examples, big data can be viewed as an extension of business intelligence and analytics, enhancing the efficiency and effectiveness of existing functional competencies and fitting with established practices in the use of technology [31]. Such a vision is not using data or advanced analytics to alter strategy, but rather to better execute a chosen strategy. Inasmuch, the relevant data is selected based on a strategy, particular measurements are defined and driven by the strategy, and results allow for organizational leaders to better monitor and control on the basis of the strategy.

Nevertheless, increases in technology, online activity, and mobile computing have led more firms to engage in efforts to secure proprietary data through big data initiatives. These mimetic responses would seem to suggest that firm-specific advantages related to data stocks are, over time, decreasingly sustainable (i.e., diminishing in value and scarcity) [3]. However, a subset of firms with leading analytic capabilities have shifted focus beyond existing capabilities, adopting a more dynamic approach that is changing the nature of business, with impacts evident across multiple types of innovation (e.g., product, process, business model), supply chain management, and diversification. The firms have become increasingly focused on data flows rather than data stocks [28], with an aim for continuous learning. These firms are not beyond using data to exploit existing competencies in traditional markets, but are persistently seeking to learn from new data flows and willing to explore new markets [39]. As such, we now look at the influences of organizational learning on the phenomenon of interest.

3.2 Organizational learning and the big data phenomenon

Organizational learning has been applied broadly across management literatures, though definitional consensus remains elusive [40]. Because we are looking at organization-level innovation and strategic renewal within the context of a general movement toward big data, our arguments most closely align with those by Crossan and colleagues [41]. Relying on premises brought forth by March [39], these authors state that renewal requires that organizations explore and learn new ways while concurrently exploiting what they have already learned. From this perspective, they promote a framework of four subprocesses: intuiting, interpreting, integrating, and institutionalizing. In short, intuiting is the recognition of patterns and/or possibilities; interpreting is the explanation of an insight or idea; integrating is the process of developing a shared understanding among individuals and taking coordinated action, and institutionalizing is the process of ensuring that routinized actions occur.

While the work by Crossan and colleagues argues for a multi-level framework—involving individuals, groups, and the organization itself—we see increasing potential for the collapsing of this framework through advances in technology attributable to the big data phenomenon. With artificial intelligence and machine learning, patterns and possibilities are now being recognized through analytics and coding rather than through individuals' personal experiences. Big data allows for this process of intuiting to occur not through one individual's experiences, but rather through mass analysis of tremendous volumes and variety of data. Interpretation is simplified through data visualization tools common in firms with a mature

understanding and application of big data analytics. Though the integration of knowledge across organizational lines still requires entrepreneurial thinking, visionary leadership, and organizational buy-in across groups, this is simplified if an analytical mindset is embraced within the firm.

Complementary scholarship within this literature stream focuses on specific elements of organizational learning, such as knowledge creation/acquisition and knowledge transfer/distribution [40]. Organizational knowledge is created through a continuous dialog between tacit and explicit knowledge [42], and amidst a balance between search and experimentation and the contrary activities of refinement and execution [39]. As such, knowledge acquisition occurs through a process of learning from experience and the recording or probing for information about the organization's environment or performance [40]. Learning is leveraged further when knowledge is transferred to more of an organization's components, who are also afforded mechanisms to enhance the ability, motivation, and opportunity to recognize that knowledge as potentially useful [43]. Hence, due to the complexities and difficulty in instituting or imitating, the creation and effective transfer of knowledge internally stand as a potential basis for competitive advantage [44].

With this understanding of knowledge management capabilities, it is easy to infer that RBT is encompassed within an organizational learning framework. While new knowledge is developed by individuals (and, increasingly, through technology), organizations (and their strategic leaders) play a critical role in articulating and amplifying that knowledge [42]. Advanced technical capabilities, ever-expanding data stocks, and excessively large financial coffers serve as resources that allow learning organizations to eschew established competencies and circumvent traditional industry boundaries and barriers to entry [27]. For example, Alphabet (nee Google) continues to explore and diversify into new markets, expanding well beyond web search and advertising as they seek to capture new data and knowledge [45]. Apple and Amazon are other well-recognized companies also focused on advancing ecosystems, new markets, and the development of analytical and learning capabilities [46]. Leaders at these organizations cultivate a growth mindset and entrepreneurial culture, embracing new technologies and tolerating risk in the pursuit of new knowledge that can push the organization forward in new and unforeseen ways. Exploration and exploitation decisions in these organizations are not solely predicated on profitability; instead, these firms are concerned with enhancing data flows, with the intent to develop innovative service modules that can be easily combined with existing platforms to execute increasing levels of service [8].

In essence, the focus on data flows presents opportunities for learning organizations to build dynamic capabilities through the extension of digital ecosystems, finding new ways to digitize and monetize evolving products and services. Strategic decisions on new product and service offerings are made based upon the potential for human capital development, multiplicative and exponential learning, and an expanding ecosystem of consumer influence. Organizations embracing a learning perspective view data not only as an available resource to be exploited for improving existing value chains, but also anticipate the untapped value of data, seeing unique sources from which to collect new data. They envision how that data can be used to gain novel and original knowledge and explore new markets and opportunities for future business endeavors [47]. From this synopsis, we now move on to an exploration for how the characteristics of big data can be interpreted through the theoretical lenses offered by RBT and organizational learning.

4. Viewing the Vs through RBT and organizational learning

Reflecting upon the Vs customarily espoused within the big data literature, volume, variety, and velocity are seen as primary drivers. Access to more (and more diverse) data, generated at ever-increasing speeds, directly effects a firm's ability to make decisions and allows it to increase its competitiveness versus firms without access to similar data stocks. Firms actively employing a data-driven strategy require significant investment in data collection and storage capabilities, as well as the development of improved analytics to handle the large, diverse, and complex datasets. Due to the nature of volume, variety, and velocity aspects, an investment must be made in the development of necessary infrastructure. Such a commitment of resources (e.g., human capital, financial capital, technological capital), properly deployed, leads to a level of efficiency and greater predictive and analytic capabilities in order to exploit advantages relative to firms without similar investments.

Firms focused on the enhancement of existing capabilities (i.e., a resource-based orientation) build such infrastructure and capabilities as to seek improvement in solving existing problems. It is also reasonable that these firms may outsource some or all of the infrastructure or analytic capabilities to strategic partners who have greater strengths and/or efficiencies in big data-related tasks, still working to accomplish the same goals for the focal firm. Regardless, these big data initiatives, whether outsourced or in-house, are typically localized to functional areas, creating successes to definitive and specific challenges but not sharing them across business units or divisions.

In a similar fashion, firms with a learning-based orientation strive for gains in efficiency and traditional value chain improvements. However, this group of firms tend to stretch their commitments into human, financial, and technical (and, increasingly, social) capital to greater heights. Substantial investments in building immense data storage warehouses, intra- and inter-firm networks, computing power, and analytic capabilities are warranted, with a continuous push toward increasing and diversifying data inputs [28]. While there is value in focusing efforts and big data innovations within specific value chain activities, true strategic impact can only happen with management having a holistic view of the digital threats and opportunities as well as associates buying in to an overall vision for how big data can reshape the firm and its competitive landscape [48]. The learning mindset and big data aspirations embraced by these firms allow for increasing abilities to search for new product or market opportunities in non-traditional spaces. Rather than simply looking for greater volume, variety, or velocity with big data investments, decisions by learning organizations are based upon the belief that greater data flows will translate to increased veracity, variability, viability, visualization, and value of data stocks. Accordingly, an expanded view of the Vs becomes increasingly relevant as the resource-based and learning perspectives are contrasted. Because firms with a resource-based orientation are focused on exploiting advantages primarily in current markets, the remaining Vs are viewed in light of this limitation.

Data veracity is important for firms with a resource-based orientation due to the fact of working with traditional metrics and processes. They need to trust the quality of the data in order to follow through and make the gains in productivity and profitability they are seeking, but are limited by their own aspirations and through their ability to monitor, analyze, and control based upon their data collection and analysis. Because their chosen corporate- and business-level strategy predetermines the data and metrics of interest, resource-focused firms proceed without the benefit of viewing the potential of enhanced data stocks and data flows. In much the same way, data variability can often be overlooked by firms with a

resource-based orientation, due to discretionary bias and dominant logics confining the firm to rigidities in traditional proprietary thinking. These firms are focused on existing value chain processes and metrics, and are therefore looking for and expecting consistency in their data to be measured and tracked over time to gauge improvements.

Awareness of data quality and data evolution is critically important to learning organizations, as it affords these firms unique perspective on opportunities to engage in ever-expanding data flows. As learning organizations are open to new opportunities and strategic renewal based upon their understanding of the data, it is incredibly important that they develop a level of comfort with the data and its sources because of the time-conscious decisions and indelible investments that follow. Even though these firms are more willing to take data-related risks, because of the sheer volume of data amassed through their ever-increasing data stocks and data flows, they are able to quickly make assessments in data quality. Their quest to increase data flows also comes with an expectation that the data will change over time, both in its source and its meaning, and so the firm develops capabilities around adapting and learning from these changes in order to parlay them into new business opportunities. Heightened alertness and responsiveness to the quality and changing nature of data contribute to the development of better organizational capabilities that identify trends in a broad array of markets, progressively monetizing data resources via entry into new markets as they extend analytic and predictive capabilities often ignored or underdeveloped by traditional firms [8].

The viability and visualization of data is also limited in firms with resource-based orientations due to contextual factors, as situational analyses are hindered by conventional views of the organization and their markets. In reality, this is restricted by the abilities of senior leadership to see its importance [49] and to break down data silos within the firm [48, 50]. The data is discernably relevant for decision-making purposes because prior decisions on strategy dictate what is to be captured, collected, and analyzed. While tools to help visualize trends in the data prove helpful, it is only for the function of addressing previously determined metrics.

Conversely, in learning-oriented firms, leaders direct their resources to collect data from many data flows, making it more challenging to determine relevance. However, capabilities are developed within these firms to help identify, interpret, and predict new opportunities, even those potentially outside traditional markets. Such efforts may require the learning or development of novel or unfamiliar metrics. It should not be construed that these learning organizations are blindly looking for data and opportunities anywhere and everywhere; there are still likely to be well-defined social, industrial, or organizational challenges that are being pursued. It is simply that the learning orientation of these firms allows them to capture and look at far-reaching data to find the most accurate and data-supported solutions, even if it means developing new and diverse perspectives and taking risks in diversifying to new markets that offer the potential for tremendous pay off [51]. It is in this way that deft visualization actually helps management see the viability of certain data, and organizations are not left to stand solely on the instinctual decision-making of organizational leaders.

Beyond all of the other Vs, it is paramount, of course, that firms actively engaged in data-driven decision making are also seeking and receiving value from their investments in big data initiatives. Resource-centric firms create value from big data through better business decisions that improve and exploit traditional capabilities. They learn to increase the efficiency of employees, improve inventory logistics for suppliers and distribution, and better service their customers. To some degree then, the value through a resource-oriented approach is concentrated on the

Attribute	*Influences on firms w/ resource-based orientation*	*Influences on firms w/ learning-based orientation*
Volume *Velocity* *Variety*	Requires proper infrastructure, commitment of resources, and a level of efficiency in organizational processes as well as greater predictive and analytic capabilities (than firms without digital strategies) in order to exploit current advantages	Same as resource-based orientation, but human and financial resource commitment stretches to greater heights amid ever-increasing data flows, allowing for ability to search for new product or market opportunities in non-traditional spaces
Veracity	Immediate high value placed here due to fact of working with traditional metrics and processes	Takes time to analyze and determine; firm must be willing to take risks here to analyze and uncover value in data; capabilities of analysis to determine veracity may be source of competitive advantage as it may influence survivability
Variability	Limited due to extensive attention and focus placed on existing value chain processes and metrics	Expansive due to quest for increasing data flows; valuable due to firm's adaptability and ability to learn as trends change
Viability	Only measure specific predetermined data elements, therefore all are relevant (but potentially limited)	Collect data from many data flows, therefore must cull and codify for analyses and make determination on relevance; unique capabilities to see and predict new opportunities, potentially outside traditional markets (which may require using new and diverse perspectives to view and analyze the data); i.e., may not be relevant to traditional markets, but could be tremendous new opportunity
Visualization	Aids in measurement and interpretation to solve key issues in traditional processes and markets	Analytical techniques that also helps interpret broad data sources to draw attention to trends and new opportunities to enhance survivability
Value	Created through development of better business decisions in traditional value chain	Created through ability to analyze data in new ways to enhance knowledge and
	functions and with economically quicker means via advanced and predictive analytics that create and exploit existing and new competitive advantages in traditional markets	develop dynamic capabilities to learn, recognize, and act upon large economic and sociocultural patterns and trends, often with such scale as to offset traditional competitive forces in order to create, enter, and/or develop new markets and/or industries with profitable business models

Table 2.
How the eight Vs of big data impact digital business strategy based upon firm orientation.

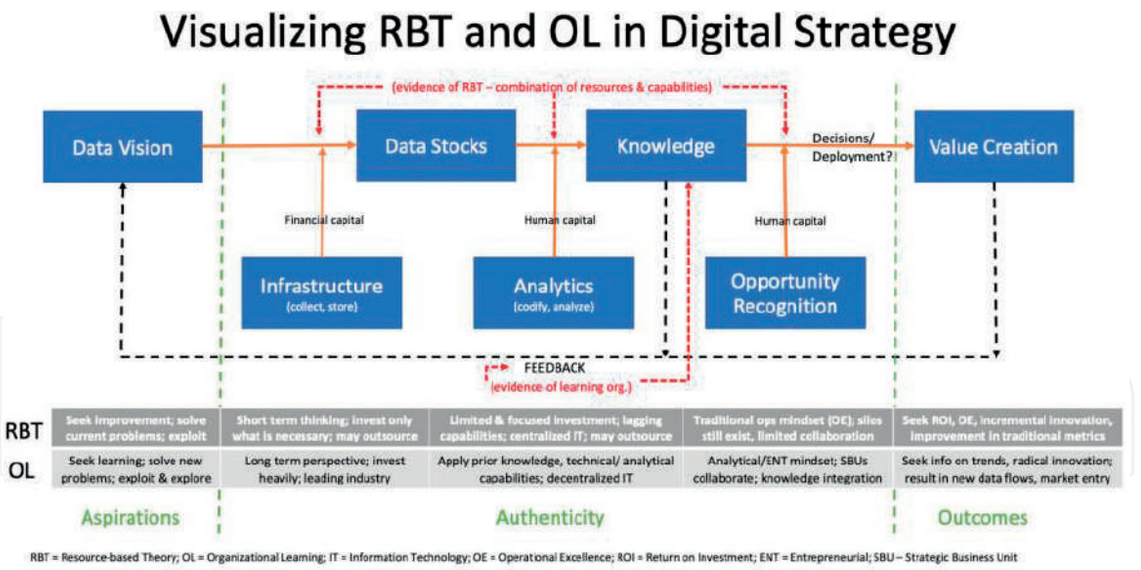

Figure 1.
Visualizing RBT and OL in Digital Strategy.

improved relationships with key stakeholders. Such relationships can be recognized and measured through a variety of financial and operational metrics likely already in service throughout an industry.

For the learning-oriented firm, value is captured through the development of knowledge and dynamic capabilities to recognize, learn from, and act on large socio-cultural patterns, often with such scale as to offset traditional competitive forces in the creation, entrance, and/or development of new markets or industries with innovative business models. They are able to effectively integrate and disseminate new knowledge across organizational silos to drive further innovation and entrepreneurship. Their business models look to expand existing lines of business, building an increasing ecosystem of services that benefit customers and build brand loyalty [30]. Accordingly, these learning organizations follow a pattern that not only builds what they know into their business models, but also incorporates a means to facilitate learning while relentlessly increasing the data gap over competitors. Despite these benefits, it is still evident that most industries still have not even scratched the surface of realizing the potential value of big data and analytics [11, 52].

Table 2 summarizes how the Vs commonly attributed to big data influence firms resource- and learning-based orientations when employing digital business strategies. **Figure 1** offers a visual to further describe how these orientations are staged across organizations.

5. Future management scholarship and the big data phenomenon

Digitization and the increasing value of big data analytics have led to a global disruption of immense proportions, similar to what was experienced during the industrial revolution. Business models and strategic thinking are changing as a result. Communication and computing technologies have developed so radically over the last 20 years that it is easy to forget we are living in an entirely new world. Decades ago, computers sat in rooms and on desktops, not in the palm of one's hand. Inboxes sat on desks, rather than residing in software. Data processing was a long, expensive, and arduous task. Accordingly, the context in which we conduct

organizational research—and even *how* such research is conducted [5]—needs to change. What is more, it seems imperative to reflect and examine whether existing frameworks, variables, and measurements are still relevant in today's digitalized business environment. Through such reflection, the evidence of earlier paradigms—specifically the important role that RBT plays—in today's digital era and the relationship with organizational learning is apparent. Yet scholars are now presented with an opportunity to conduct a renewed examination of how technology interacts with strategy. Although leaders of the field have iterated a call for research and theory development in this area, significant movement has lagged. To assist in the advancement toward this end, we present a number of avenues to begin addressing these gaps, not only in strategy, but across the field of management.

5.1 Avenue A: theoretical development across management

Through this paper, we extend theoretical development by looking at how the big data phenomenon is interacting with RBT and organizational learning in new and novel ways. These are overtly and perceptibly not the only theoretical underpinnings found within the big data phenomenon, nor are they the only ones that may be challenged by the changing competitive landscape. As such, scholars have an exceptional opportunity to identify unique applications for existing theories, create new proposed boundary conditions across the field of management, or develop novel theoretical frameworks and extensions, such as in the domains of strategy, entrepreneurship, or human resources.

We make the case to further develop theory around existing streams of research in the extant knowledge creation, knowledge management, and exploration/exploitation literatures. The likelihood that management theories are universally true across all periods of time, contextual situations, and especially after radical innovations have been brought forth to the market is highly unlikely. It is our contention that when the assumptions used in developing theory are challenged by existing realities of the world, the management field should reconsider "what it knows" and look at its theories to drive forward more relevant understandings of the world. This is not to suggest that traditional theories of management will be invalidated. Rather, it is necessary to revisit paradigms, challenge assumptions, and explore alternative explanations. The digitization of business models, fueled by the big data phenomenon, is a massive economic transformation; therefore, a new and concerted effort to look at the underlying theories of our respective fields should be considered at this time.

5.2 Avenue B: investigating antecedents to data- and analytic-related capabilities

Beyond applying theory to better understand the nature of organizational decision making in the era of big data, it is imperative to explore the context and antecedents that allowed these organizations to leverage data and analytics for competitive advantage. What is it that allows for firms to transition into data-savvy organizations? Are there characteristics or nuances that propel firms and allow for the transformation into learning organizations? Externally, are their environmental factors that specifically trigger such adaptation?

Undoubtedly, we see application for traditional explanations such as visionary leadership, organizational culture, strategic resource heterogeneity, and environmental hostility. Yet scholarly examination should better explore the true characteristics and environmental stressors that elicit impactful organizational change that increases data and analytic capabilities. Tracking firms globally and

longitudinally—through both qualitative and quantitative investigation—is necessary to properly uncover specifics about firms developing competitive advantage through a combination of big data analytics and strategic thinking. Are CEOs business school educated or do they have STEM (science, technology, engineering, and/or mathematics) backgrounds? Do they have brief or extended tenures in their organization? Were they founders? How was culture characterized before the shift, or was analytics core to the identity of the firm from inception? What was the nature of the industry cycle? Were resources plentiful in the environment? Was the company an industry leader, or falling behind? Were there disruptive innovations occurring (beyond digitization)? There is ample room for discovery of these and many more aspects to better understand the full scope of big data's impact on organizations.

5.3 Avenue C: reconsidering outcomes and consequences

Big data's emergence, in combination with disruptive business model innovations, has created an opportunity to reconceptualize organizational performance. Industry no longer uses a simple measure of profitability or traditional financial ratios, as success now relates to quantities of users on platforms, the richness of data flows, the collection of data stocks, or the knowledge created through the business activity. If we reconceptualize organizational performance more holistically, how does that open the definition of competitive advantage up to include the realities of a new contextual business environment?

Without understanding how senior management at digital-savvy firms perceive performance with regard to certain offerings, our current measurements may not allow us to properly test the hypothetical connections and theories that the big data phenomenon allows us to predict. Deep dive qualitative studies and case analyses surrounding digital transformations, as well as companies that have been founded digital, should be conducted to examine how these firms measure success. Additionally, companies that are founded and run by technological or analytical leaders should be more intimately compared and contrasted with companies founded and run by traditional operational management to better understand the underlying differences and subsequent impact on performance.

5.4 Avenue D: refining and specifying the measurement of variables

The uses and application of big data have so thoroughly transformed methods and processes in the business environment that it is now necessary to not only reconceptualize theory, but also transform how we measure and model behavior, whether at the firm, meso-, or microlevel [5]. In the previous section, the change in how firms define desirable business outcomes was discussed, but future research will derive additional value when firm-level performance is measured in a manner that brings together the divergent ways that firm performance is now viewed by learning-oriented firms.

The same novel tools and data stocks that have digitized businesses can also be used for the qualitative testing of management theories. Therefore, macro level constructs that relied on poor proxies (or simply were unable to be measured) could come within scholars' range as they begin to open their perspectives to how business is conducted, what data stocks and flows are generated, and how they could capture them anonymously. Relying on changes in strategic human resource analytics capabilities in firms to create and predict behaviors will significantly impact our ability to understand organizational phenomenon beyond current

methodologies. Learning-organizations have large scale human resource analytics capabilities developed through the recruitment of Ph.D.-level employees and research fellows. For insight into this, we need not look further than the great interest of managers, scholars, and students in Google's people analytics, where HR professionals work hand-in-hand with organizational scientists to identify the most effective fact-based solutions, rather than relying on individual experience and debate.

More precise measurements in management are not only important from the perspective of the scholar hoping to create new knowledge, but also as a means to better understand both the phenomena of big data and, more generally, organizational entities. This translates into better research, teaching, and practice of business strategy and management. As scholars are able to more precisely measure what it is they are defining, the insight gained from research increases by magnitudes in its translation into teaching and practice, resulting in an important reconnection to the community, where business scholarship has strayed over the last several of decades. We believe that the big data being collected en masse by today's firms will be the scholar's playground tomorrow if the field positions itself to advance the practice as well as the theory of organizations. The big data phenomenon has the potential to bring organizational science back to life in a way that should be exciting to a diverse group of individuals, including future scholars.

6. Conclusion

The link between the firm's IT and competitive advantage has long been discussed in the literature (e.g., [53–55]), but we proffer that technological resources and capabilities are now dictating which strategic approach a firm can and will take to the market [27]. How firms choose to explore new markets is not done through traditional strategic planning, but instead evolves through opportunity recognition based largely upon information gleaned from consistently analyzing more and richer data flows and stocks. The emphasis on data and data analytics as strategically important to a firm's success has the potential to contribute to important developments in understanding organizations in a world where digital is rapidly overtaking traditional business models. While there is the possibility for considerable debate over whether big data practices can provide a sustainable competitive advantage, arguments can be made that continued advancements and innovation in infrastructure, analytical capabilities, and organizational processes will leave plenty of opportunity for proactive firms. What is more, while individual data stocks may be imitable, bundles that include proprietary data, dynamic data analytic capabilities, effective strategic decision making, and an entrepreneurial spirit will likely remain unique to a particular firm and translate into the creation of new knowledge and ambidextrous execution (i.e., both exploiting existing markets and exploring new opportunities).

Reinvestigating the interplay between technology and organizational strategy is needed, as big data is likely to play a role in changing the landscape of social and economic policy and research [5]. As such, the importance of beginning this line of study within the strategy literature is imperative. Closing the gap between traditional strategic thinking and how strategy is currently employed in superior performing firms will test the ability of the field to match management theory with reality. In doing so, scholars can erase the perceived naiveté surrounding management theories and demonstrate the complexity witnessed in the real world through contemporary and meaningful scholarship [56].

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Conflict of interest

The authors state there are no conflicts of interest with regard to this manuscript.

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Chapter

Underlying Forces of Organisational Control on Administrative Behavioural Theoretical Insights

Kofi A. Boateng

Abstract

Control, for a long time, has been a constitutive aspect of organisational sociology. However, much of the scholarly account on the concept has overlooked a critical character of discretion in organisational discourse. By meticulous application of Herbert Simon's theory of administrative behaviour, this theoretical piece reveals the interesting dynamics of organisational control to bring the enduring significance of discretion in the control of subordinates at work. The analysis draws on the idea that control is not merely about the predetermination of goals that are achieved at the lower level. In views of this, the research advances a primary conceptualisation of control as double-edged model, adding the application of discretion that, occasionally, makes subordinates lead and encourage vital control practices that drive the life of the organisation.

Keywords: control, rationality, authority, training, organisational loyalty

1. Introduction

Instances of organisational control exist in varied manifestations [1, 2], and its appreciation in view of mediated interaction [3] can be driven by a motely of underlying themes in administrative behavioural analytical perspectives. However, scholarly views on control in terms of administrative behavioural theoretical insights appear to have been overlooked in the mainstream human resource management (HRM) literature [4]. Some of the sociological theories that readily come to mind to possibly offer explanations into the phenomena under investigation now are institutional theory [5, 6], agency theory [7, 8], structuration theory [9], actor-network theory [10], and information processing theory [11], among many others.

Particularly, structuration and institutional theories have the possibility of assisting in shedding lights on the routines and norms of sanction against both organisational and individual actions over a stated period. Usually, these theories provide some form of assistance, nevertheless, in giving extensive interpretation and analysis of the purposeful orientations and psychological reinforcements necessary to appreciate the individual and organisational undertakings in their application of systems of technology. Structuration theory in its basic formulation indicates restricted sense to address issues of technology use [12]. On the other

hand, institutional theory has the inclination to over-accentuate the even patterns that exemplify predictable organisational praxis unless exogenous factors induce a transformation of the status quo [13]. By virtue of these elucidations, these theories are hardly ever substantial in their ability to give the real-world outlook instrumental to stimulating our thoughtful consideration into a realistic understanding of individual and organisational behaviour in their categorical versions of functional complexity.

For example, vital matters like organisational recognition, identification and loyalty, the instrumental role of authority, the psychology undergirding administrative decisions, channels of communication and the manner of efficiency hardly get any worthy attention from the theory of administrative behaviour. Notwithstanding this, it would be appropriate to suggest that administrative theoretical framework has the capability to challenge our current stock of knowledge and understanding on individual and organisational behaviour in everyday experience, especially from the standpoint of control in contemporary organisational interactions. Consultation on certain technology-oriented theories could not be relied upon to offer any encouraging attraction despite their near-balanced attention to behavioural and technology issues within the sphere of control in administrative behaviour. By the same account, socio-technical theory (STT) and task-technology fit (TTF) theory could not be applied as both theories have a very limited way of contributing to control and its varied implications for organisational configuration (see, for example, [14–16]).

However, given the rationale of this scholarly piece—to understand control and its manifestations and ramifications from the standpoint of administrative behaviour in contemporary organisational discourse—I have decided to apply the theory of administrative behaviour [17] to this compendium. The reasons for this stance are not far-fetched, to enable an extensive exegesis on the issues meant to be explicated.

Firstly, the theory of administrative behaviour provides a far superior explanatory power for doing a detailed discussion and analysis of organisational control in collaborative engagements. Secondly, the theory of administrative behaviour has a better explanatory power by means of the diverse thematic ideas that are well situated to offer the hands-on use and the additional repercussions for control. Worker, customer loyalty and discretionary actions are some of the occurrences of the associated consequences of contemporary organisational discourse in accommodating the subtleties of organisational control. Thirdly, administrative behaviour is relevant to afford philosophical and psychological commitment and understanding crucial to formulating ideas that intimately account for the inspiration driving the appropriation of mediated artefacts in daily organisational interactions.

In other words, the psychosomatic and theoretical models found in the theory make it not only exemplary but also practical in projecting a thorough execution of organisational control in organisational discourse. Last, but not least, applying administrative behaviour in a fundamentally diverse organisational milieu can give a typical test to the appropriateness of the theory and, probably, demonstrate its shortcomings on studies related to control in organisational discourse from the viewpoint of administrative behaviour.

In what follows, I introduce the theory of administrative behaviour and demonstrate how elucidation of its primary precepts and indispensable concepts leave us with no doubt as to its significance in articulating control from the standpoint of modern organisational interactions in administrative behaviour. In the pursuance of this objective, the epistemological path plus a sketch of administrative behaviour are showcased by means of a discourse on the elementary and cross-disciplinary ideas from which the theory originated. The mechanisms of organisational

influence are elaborated by teasing out such themes as the exercise of authority in organisations, and the structural constituents of authority. That provides the opportunity to further consider the triangular structure of authority with respect to responsibility, coordination and specialisation, all analysed as the various categorical versions of control in administrative behaviour. The rest of the paper reflects the vital importance of training in securing individual and group commitment to the course of the organisation. Lastly, the psychology of administrative behaviour is scrutinised to highlight such principles as rationality, organisational loyalty and routinisation of work as a consideration of future research directions on the subject of control in administrative behaviour.

2. Philosophical foundations of administrative behaviour

The history of administrative behaviour is traceable to Herbert Alexander Simon, who coined the expression to describe the practices persons embrace to work in organisations. To be put simply, Simon investigated the multifaceted purposes of firms through the administrative behaviour template. The justification and drive that led to the theory of administrative behaviour (TAB) can be associated with Simon's original work on decision-making in organisation. Simon's determination to clarify—in intensely brief way—the practices linked with the administration of people and the cherished procedures relevant to the working of organisations prior to their existence foreshadowed the theory of administrative behaviour. Roundly persuaded that satisfactory terminology was not forthcoming in the field of the suitable schemes for reasoned treatise on organisations; Simon pursued an academic expedition that investigated the constructs worthy of support to organisational sociology.

With this academic expedition, Simon firmed up the means of target formalisation and task assignment procedures plus genuine organisational performance. The control of subordinate actions emphasises, though obliquely, the manner of administrative behaviour in varied situational scenarios. Nevertheless, with the overriding attention the setting of goals and their achievement receive in the theory, it is appealing to understand control as being relegated to the peripherals. Perrow [18] made references to this view in his suggestion that the notion underscores unassuming subordinate control in terms of their interactions in information exchange, norms and standards as well as in preparation. This tool of control is accentuated by stipulating the procedures for realising determined aims, however, contradictory to a person's (the individual under control) knowledge of likely alternative decision choices.

Administrative behaviour theorises the idea that determinations with 'higher value component' originate from the highest level of the structure of the organisation while subordinate at the bottom part make decisions rich in factual content [19]. The top-end choices stresses the *what*, but the factual content underscores the *how* part of subordinate judgements. Altogether, this dualistic nature of decision-making presents a bird's eye view of the concept of administrative behaviour. Thus, the entirety of decisions in organisations is a mixture of value premises (beliefs of all the means necessary) and factual premises (the practical situation). In this scenario, the real and applications of administrative behaviour are shown [20].

'*Choice of ends*' and '*choice of means*' constitute the chief tenets of administrative behaviour as Simon espouses to signify the nature (what) and functions (how) of decisions, respectively. Organisational actions at the highest managerial level are manifested via consensus building or fiat decisions connected with choice of ends. In this scenario, goal-led decisions characterise choice of ends since it determines

obvious conditions for realising certain organisational aims at the top level of management. Choice of means connects with the resulting subordinate judgement driven by realistic and emergent occurrences. Simon identifies the realistic and emergent circumstances that confront subordinate decision-making at the point of performance as 'the observable world and the way in which it operates' ([17, 19], p. 55).

It is the very uncertain character of the observable world that encourages subordinate discretionary decisions in the course of performance. The rationale could be that value premises might be inconsistent with factual premises at the moment a performance is necessary, as factual premises are driven as well as inspired by situations completely directed by nascent and uncertain forces. Nonetheless, the final subordinate action is also inspired by the inclusive intentions of the organisation [19], as aberration from these unequivocal objectives in terms of the controlled (the subordinate) may induce sanctions or punishment from the organisation's upper level.

As per the techniques of organisational decision-making, it seems lower level employees and their bosses run on two ever-opposing wavelengths of decision-making. However, the final purpose of these decision-making functions is the attainment of a shared aims of the organisation. To this end, the complete organisational hierarchy 'can be viewed as a congealed set of means-end chains promoting consistency of decisions and activities throughout the organisation' ([21], p. 46). Simon [22] articulated the making of decisions and managerial processes by which advance determination of goals and the establishment of control schemes motivate sensible organisational behaviour. Simon discounted Henry Fayol's idea of 'economic man' and substituted it with 'administrative man', who is somewhat aware of all the possible options of his choices and so is ready to go with those that produce satisfactory approval.

To him, the notion of optimisation is quite misrepresentative as the prospects of attaining the utmost possible result seems characteristically elusive. Drawing on March and Simon's [23] considerations on bounded rationality, Simon shows the parameters in the intellectual talent of decision-makers. Simon championed the use of 'uncertainty' in organisational decision-making due to the real impossibility to derive total and complete information at any particular period during the decision-making process. While this may not be altogether a new idea, it is fair to consider that Simon initiated that notion and that later won him the 1978 Nobel Prize in this field.

The notional devices that Simon applied to comprehend the cosmic system intersects with a broad gamut of disciplines, such as, administrative theory, public administration, political science, organisation theory, economics, psychology, sociology, philosophy, computer science and cognitive science [4]. Reconsideration of the principled impression of making decision with particular allusion to reasonableness took a substantial share of his time. Consequently, rationality became the underlying logic in almost all the fields of enquiry he was related to because the idea encircled and occupied the broader structure of society. Hence, his efforts to dilate on rationality predictably got him to varied theoretical perceptions on economics, philosophy, psychology, sociology and politics. The relationships involving information, decision-making and technology appeared to be Simon's key research attention during the final part of the 1950s [24].

Notwithstanding Simon's multi-layered-disciplinary orientation to administrative behaviour, problem-solving and decision-making, he did not restrict his allegiance to any one specific discipline. To be sure, he indicated in a discussion cited in ([4], p. 583) that 'If you see any one of these disciplines dominating you, you join the opposition and you fight it for a while'. The core of Simon's influence was on problem-solving and decision-making in the specific aspects of individuals, organisations and societies. For example, Simon's [25–27] cases are of such works. 'Logical positivism', explained simply by Simon as possessing a similar meaning as empiricism ([19],

p. 68), is apparently the crucial recurring argument in the work of administrative behaviour. Administrative behaviour has at its centre the searching of perceptible organisational consideration driven by the rigours of organised approaches. In view of this, subjects like philosophy, the social sciences and mathematics are practically considered along with the study of administrative behaviour [28].

3. Control in organisations

Control in administration invariably denotes shaping the character of the governed, transforming and guiding their operations to be favourable and aligned with the ambitions of group and the firm's aspirations. The foregoing logic demonstrates, as it does, at least, three central ideas, namely, authority, training and organisational loyalty, that profoundly undergird the workings of organisational control. Each of these fundamentally affects and encroaches on personal engagements resulting from different situational exigencies. When social agents become formal members of an organisation, the organisation is confronted with the problematic situation of how to modify the members' behaviour consistent with the overall organisational frame of its activities. A couple of internal and external influences by way of stimuli are applied to deal with these behavioural checks. These are 'the stimuli with which the organisation seeks to influence the individual and the psychological "set" of the individual, which determines his response to the stimuli' ([19], p. 432).

Influencing the organisational agents places their character on a commonly recognised form in two basic categorical forms. The sets of influence are qualified as 'internal' and 'external' and each category drives, to a more or less degree, all the main means by which organisational dominance is achieved, namely, authority, training, identification or organisational loyalty and communication.

3.1 Authority orientation in organisations

Among the means of influencing personal and group actions and leading behaviour in organisations, authority seems to be the one that evidently and principally sets apart the behaviour of individuals as actors within the organisation from that of their behaviour outside of it. Authority identifies the official structures for the organisation on which the other expressions of organisational influence depend. It is pertinent we firm up a sense of what authority represents, as far as its explanation so as to set up the frame for the various manifestations of its effect within the organisational setting. To this end, Simon purely submits authority as 'the power to make decisions which guide the actions of another' ([19], p. 179). However, in the interest of thorough analysis and more all-inclusive understanding of the notion of authority, drawing on Barnard's view provides enhanced and enriched explication.

Barnard's view suggests a clarification that affords a necessary association that highlights the actual essence of authority within the context of the organisation. The account provides a hint of the frontiers for the impression of suitable personal organisational behaviour contingent on a crucial level of relationship. This relationship portends substantial logical reasoning for appreciating mediated control in ICT-driven interactions as instructions or guidelines designed for the realisation of organisational aims largely shift from the upper part of organisational ladder to those at the bottom level of the organisational structure. The lines of authority can also start from one department to another, not essentially in a hierarchical order. Prior to an individual's familiarisation with the numerous dominant instructions, they must have been provided with clear guidelines pertaining to the conditions

placed on their conduct. The settings and conditions delineating such conduct and the terms by which they are showcased must be unfailing, and be consistent, with the complete desires of the ideals of the organisation.

A parallel interpretation of authority is theorised by Simon that noticeably portrays the subject-object duality of authority. The subject-object duality underscores the senior/junior spectacle intrinsic to authority relationships, which Simon expounds as mainly hinging on 'objective and behaviouristic terms'.

The shared expressions of desired behaviour between the boss and the subordinate account for the presence of authority. Thus, the subordinate must recognise and perform legitimate directives of the superior for authority to triumph. Perrow succinctly conveys this idea when he considers that in a situation where a subordinate declines to carry out legitimate instructions from an authority above, the superior loses their authority ([18], p. 71).

The rational supposition from the preceding quote indicates that in a circumstance where the desires and anticipations of the superior are not adhered to, authority would not be deemed to exist. The behaviour configuration of the subordinate on other hand is affected by specific considerations for engaging in some form of operation. Consequently, the matter of discretion is brought into the decision-making processes of the subordinate before undertaking a given assignment. Thus, the subordinate subjects his private agenda by projecting the wishes and command of their superior as a basis of his action ([19], p. 179).

To Chester I. Barnard's mind, authority flourishes on two primary levels, namely, the subjective and objective phases. While the subjective phase involves the 'personal, the *accepting*[1] of a communication as authoritative, the latter relates to the character in the communication by virtue of which it is accepted' ([19], p. 163). Chester's objective-subjective dichotomy on authority supports a vital analytical device for this piece as it provides a comprehensive means to appreciating the foundations and functions of organisational control. It offers superior clue that shared influence is intrinsic and essential to any control commitments. Subordinates must be ready to embrace guidelines and instructions for goal-centric results to be obtained. By a similar account, superiors should be able to embrace and encourage the proposals and creativeness of subordinates in the interest of stated organisational goals. A scenario where a subordinate declines to obey reasonable orders issued from a superior undercuts the true pillars on which authority rests. The maintenance of authority is subject to the dominant ideas of the people whose decisive goal is to have specific operations undertaken for their joint advantage.

For authority to be purposeful, it is crucial to guarantee the relevant involvement in terms of private efforts aimed at common targets. There should be the presence of structured individual efforts inextricably linked with prompt dynamic interests at any stated period with the aim of maintaining the reliability of the prevalent organisational authority insofar as instructions lie within the purview of, what Chester labels as, 'zone of indifference'. By zone of indifference, Barnard [29] attempts to illustrate a situation where lower ranked employees incontestably accommodate the guidelines or directives for carrying out a goal-oriented duty. Disparities exist in the zone of indifference. The disparities reveal diverse forms of broadness and narrowness subject to the extent to which inducements exceed the 'burdens and sacrifices' that describe a person's loyalty and attachment to the organisation.

Authority possesses bi-modal source, all of which seem to complement rather than contest with the technological and social components. The establishment of

[1] Italics in the original

authority in an organisational environment is, therefore, dependent on these same technological and social apparatuses. There is a reciprocal shaping of both social and technological components in the expression of authority. For example, technology is as vital in putting structures of authority in place and effecting behaviour just as much as the social (human) devices in the realisation of expected behaviour and motivating predetermined results. Both work hand-in-hand as each has its field of operational emphasis. In view of this, individuals aver their allegiance to human authority systems in pretty much the same way as they submit to the demands of technology-led cooperative and control systems. Controlling group, varying private behaviour and influencing organisational objectives and requirements imply modifying the mechanisms that convey the demands for the performance of certain operations. With these analytical notions of authority, it is possible to delineate the nature of authority through which these features manifest as well as the procedures that underlie its operations.

3.2 Structural apparatus of authority

Authority can be said to rely on three basic stakes of operationally interlocking equivalents of responsibility, specialisation and coordination [29]. It is compelling to accentuate the role of each of these structural apparatuses and explore how they, together, operate in concert to offer some novel insights into the appreciation of control. It is vital to highlight this dimension as it assists to widen the scope by which social agents, with motley organisational agendas can purposefully be understood. Each of these dimensions of authority merits some consideration in turn, because controlling the activities of subordinates by means of both output and behavioural expectations, demands a significant degree of responsibility, specialisation and coordination. Responsibility defines performance expectations, specialisation clarifies the degree of discretion and coordination stipulates the synchronisation of individual (superior and subordinate) endeavours. Now I turn attention to focus on how these concepts become implicated in control in organisational discourse from the viewpoint of administrative behaviour.

3.2.1 Responsibility

A primary aim of authority that appears to win the attention of administrative behaviour enthusiasts is its purpose to assert group and individual acceptance of the principles of standards of behaviour established by those at the upper levels of authority [30]. Responsibility suggests the power of a 'particular private code of morals to control the conduct of the individual in the presence of strong contrary desires or impulses' ([31], p. 263). To a greater extent, a particular conduct is administered by diverse private codes. Such codes could be high, simple low, complex, sketchy or comprehensive, based on a person's ethical status. Logically, general tendencies exist whereby people act in consonance with private interests and contrary to determined organisational ideologies. In view of this, 'elaborate set of sanctions may be evoked and applied against the recalcitrant member' ([19], p.187) upon contravention or disobedience to established instructions, rubrics, standards and recognised principles in the carrying out of specified operations. In Barnard's view, the clash of codes of behaviour has serious repercussions. The risk or enduring fear occasionally present in the use of disciplinary tools can go as far as to offer people some opportunity to engage in manoeuvres favourable to their private agenda.

In Gaus' view [32], it is almost assuredly unconceivable to think about authority in the administration of organisations without encouraging its analogous

considerations on the structures that invite different grades of the hierarchy of organisations to justify their operations.

3.2.2 Coordination

Essentially, coordination aims to guarantee a cohesive sense of purpose towards a shared direction [33]. In other words, the particular application of coordination is 'the adoption by all the members of the group of the same decision, or more precisely, of mutually consistent decisions in combination attaining the established goal' ([19], p. 190). The duty of compliance with a mutual command and objective makes communication a challenge to, and a crucial aspect of, coordination. Coordination advocates the incorporation of the various 'islands of automation' to accomplish the overall efforts of the organisation. ([34], p. 511). Varied private and team events are unified to attain a common organisation-inspired ends. Communication is the vital factor that secures that functional differences are synchronised to reflect the collective contributions of all the participants in the organisation. From a philosophical viewpoint, authority functions as a harmonising device [35]. Authority endorses the establishment of command structures and communication channels by which individual commitments are coordinated towards the attainment of a common aim. The communication avenues strengthen interdependences among different organisational entities [36]. Coordination could be evident in two deeply separate types, in the form of procedural and substantive. Procedural coordination tries to highlight a sketch of the extensive amplification of the actions and associations of the members in an organisation, while substantive coordination connects with the functional endeavours of the firm.

In Simon's view, the delineation of the chains of command with directives establishing the constraints on individual agents epitomises procedural coordination, although schemes for the creation of specific goods and services characterise substantive coordination. The core of coordination buttresses the conviction that allows people in a harmonised entity expect the probable conduct of their associates. To realise the highest degree of coordination, Gulick recommends the execution of a couple of primary pragmatic necessities.

By organisation, that is, by interconnecting the sub-categorisation of job roles by assigning them to people who are connected in a line of authority. The rationale is for purposeful coordination of work by the orders of bosses to subordinates, moving from the top to the bottom of the whole enterprise.

3.2.3 Specialisation

Specialisation as an expression of authority inspires the vital worth of administrative proficiency, the spirit of which resides in the awareness that organisational entities differ in their expertise, experience, proficiency, capability and appeal. This belief is informed by the propensity of specialisation to enhance output by boosting profitability [37]. Crucial to specialisation is the notion of division of labour in which 'the work of the organisation is subdivided, so far as possible, in such a way that all processes requiring a particular skill can be performed by persons possessing that skill' ([19], p. 189). Specialisation has its attendant continuous reciprocal fine-tuning by agents in collaborative efforts. Barnard [29] sketches five dynamically interconnected benchmarks by which specialisation gets implicated in constituting organisational activities, which include *specialisation by location*, *time*, *expertise*, *artefacts* and *methods*. None of these separations avoids the part technology plays in carrying out and underlining the particular demands of their corresponding operations.

Specialisation by location connects with the terrestrial area where job is undertaken. Spatial organisation of job by way of accommodation, air-conditioning, compartmentalisation, etc. offers a notion of individuality for finishing certain tasks. Time-induced specialisation is necessary for arranging the procedures and patterns of composite operations, principally in places where work is done in the mode of day-and-night to offer accelerated and premium service. The coordination test for the period of synchronisation at which work is completed has repercussions for promptness and stability in the course of work. Lost time, unobtainability of the relevant resources at the appropriate moment and engaging in things in an unsuitable manner are some of the real-world problematic scenarios to time-led specialisation.

Know-how as an expression of specialisation underscores the vitality of entities in organisation that performs various specialised tasks. Training and selection processes are led by proficiency and readiness to adhere to uncompromising time timetable of structured arrangements so as to ensure the needed practical skill [38]. Specialisation is also evidenced in the devices and objects applied to complete a given task. In this case, certain accoutrements and technological artefacts may be favoured ahead of others in certain task performance, such that the processes may result in various effects of the final outcome. For example, telephone may be desired for instantaneous response on unmediated interaction to email. Lastly, aspect by means of which specialisation can take place is the processes or modalities that agents apply for the attainment of their operations. The efficiency of such process-inspired specialisation is subject to the adroitness and the expected flexibility of agents involved.

The following figure (**Figure 1**) is initiated as a proxy to Barnard's exposition on the functional nature of authority.

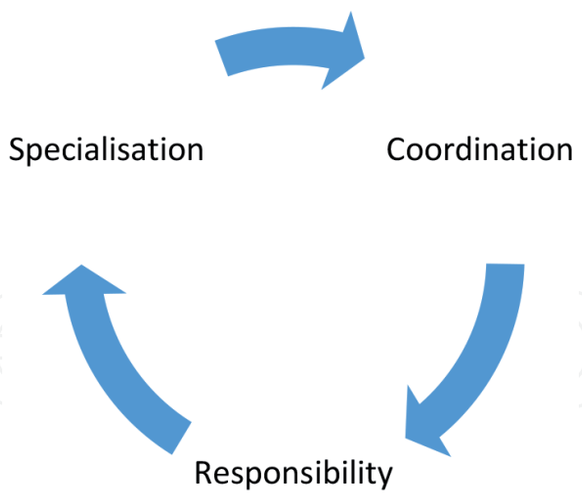

Figure 1.
The authority triad based on Chester Barnard's [31] analysis of the concept.

4. Training in organisational influence

Training offers one of the means that assists organisations to effect the character, practice and attitude of their staffs. As a style of organisational stimulus, training changes social agents 'from the inside out' ([19], p. 13) and as such, shapes their choices and judgements sympathetic to the functional competence and administrative fidelity. Key to this notion is the system of indoctrination, which gets employees to do away with unhelpful conduct and features while instantaneously

picking up other traits and abilities that come between them and productive output [39] via learning. Accordingly, training stresses the importance of developing capacity. Getting employees ready to handle the challenging exigencies linked with given tasks is a crucial component of training. The notion of training could be to diminish the regularity with which directions and rules are given to guide subordinate behaviour. In this case, training 'prepares the organization member to reach satisfactory decisions himself, without the need for the constant exercise of authority or advice' ([19], p. 13). Logically, even though training assumes a substitutive control mechanism by which to shape the judgments and choices of employees, it could also be considered as, what I call, a discretion-granting channel. Reinforcing the discretion-granting construct, Simon directs our focus on the point that minimal supervision is necessary after the time of training.

Perfecting the specifics for carrying out a given duty with the slightest degree of faults and blunders is the trademark of, and the logic driving, many training arrangements in organisations. Training, thus, encourages a certain extent of delegation of duty as a vital link of shaping character at different levels of the organisational ladder. The decentralising process conditions the context for employee thinking and activities, driven by wide structural instructions designed to inform and pattern behaviour at the subordinate level of the organisational structure. Training understood in this sense is a prospective basis for encouraging consistency and dependability [40] plus imbuing poise and courage in worker decision-making in terms of their acceptable operational efforts.

Regardless of its promise to diminish the extent of mistakes, coupled with the assertions of reinforcing the ideals of requisite variety to certify dependability among social agents, training is thought to be the source of several unsatisfactory circumstances [40]. Without a doubt, training fails to uncover all the likely circumstances that social agents are expected to experience in the normal period of their legitimate tasks. It is plausible to concur with Weick that training packages in many situations fail to match up with the factual situational happenings that real-life settings provoke [41]. The ensuing struggle between training experience and exposure to actual exigencies may cause even competent staffs to recoil and cling to deep-rooted behaviour [42] much to the detriment of organisational strategizing.

This could be troubling, and could therefore condition the awareness and determination of social agents with unfriendly repercussions, typically the prospect of undesirable outcomes on objectives and proficient performance. Again, when training is fruitful, familiarity through experience brings little certainty for employees to deal with the fleeting and changeable forms of work the moment they take up the demands of their tasks. Put bluntly, employees are barely offered an identical setting they received for their training 'once they actually operate the system' (Weick, p. 332). The ramifications of this scenario could be irritatingly unsatisfactory and occasion work-associated tension by harming the emotional balance of employees thus placing them in a situation less able to cope with impending challenges.

Directing attention on training in the control of employees in administrative behaviour could be a definitive means of accepting the essential antecedents and consequences of the rationale training occasionally fails to achieve its ideals. This failure can act as a true source for probing into the perceptual narrative meant for this unpleasant situation. It could also highlight an operational realignment of the forces that condition the facilitating environment for effective training efforts. It could also mark a preliminary point for studying the crucial dimension of technology mediating artefacts in deciding their usefulness in training arrangements. On account of this, the necessary relationships can be recognised between the difficulties connected with reality and the ordered nature of training settings. This would lead to a legitimate call for the motivating factors of the strategic management of

training approaches to fit organisational control strategies. Against this situation, some form of validity would be brought to bear on the evidence of mediated control in collaborative work environments.

5. The mindset of administrative behaviour

To appreciate the relevance of administrative behaviour to this essay to any substantial mark, it is critical that the appropriate cognisance is afforded to the degree to which the mentality of the individual gets accounted for in the entire realm of organisational operations. This is meant to envision how the organisation modifies and alters their attitudinal trajectory. Giving some thought to this part of the theory is vitally important because one of the primary jobs organisations undertake is to 'place the organization members in a psychological environment that will adapt their decisions to the organisation objectives and will provide them with the information needed to make these decisions correctly' ([19], p. 92). The mindset of administrative behaviour is befitting for analysing control in mediated interaction due to the fact that notions such as rationality and organisational loyalty can be applicable to different motivations for control in organisational interaction. Ways by which these can be ascertained are the idiosyncratic explanations for the application of mediated interaction and the degree to which these same mediated interaction exercises encourage employee loyalty or disaffection.

5.1 Rationality

Rationality is considered a basic and significant frame in administrative theory. And it is relevant to link it with mediated control to figure out the kind of forces that drive the choices and actions of subordinates in undertaking their given obligations. It should be pointed out in advance that paying attention to rationality is not meant to illustrate employees, as is habitually supposed, as primarily logical, an understanding that overshadowed much of economic theory. To be sure, rationality should be encouraged to mirror the entire conclusions reached by social agents in situations connected with their precise organisational commitments even though such ultimate decisions may be inaccurate to the 'objective bystander'. In other words, rationality in this situation has more of a strict application than its conventional dictionary implication of 'agreeable to reason: not absurd, preposterous, extravagant, foolish, fanciful or the like, intelligent and sensible' ([43], p. 2).

Furthermore, rationality in this instance is not only regarded as a preserve of humans, material agency [44, 45] can also be ascribed as rational to the extent that 'structural arrangements within organisations are conceived as tools deliberately designed for the efficient realisation of ends … Rationality resides in the structure itself, … – in rules that assure participants that evaluate performance and detect deviance, in reward systems that motivate participants are selected, replaced, or promoted …' ([46], p. 78).

In view of this, rationality is generalised to embrace organised systems of processes and directions intended to permit the sound advancement of flow of work from a process or condition to another. Rationality in this study, fundamentally, reinforces control in its claim. Rationality appears to encompass three crucial cognitive processes of intuition, reasoning and perception. These cognitive processes are contingent beliefs, opinions and preferences and that commonly motivate and drive individual action. At least one of the primary cognitive processes is stimulated in arriving at conclusion before carrying out a preferred course of action. Rationality can then be deployed to appreciate flexible activities as far as mediated control.

Accordingly, rationality concerns itself with the practice of 'means-end' series of arrangements or levels of objectives. The means-end angle illustrates the technology or material component part of rationality. The technology bit, which, as a matter of convenience, can be designated as system, projects the incorporation of behaviour by which the sub-entities in the whole system work to disclose the general purpose for which the system was intended. Rationality requires evaluating calculated choices for obtaining the crucial goal. It should be feasible to advise consistent with Simon [19] that rationality is dependent on 'useful purpose' for an individual or organisation in undertaking a given exercise.

In rationality, mindful or determined act and unplanned activity become obvious in the thought processes of making decisions. However, an inadvertent act can be considered once the particulars for performance have been learned to the extent that it becomes programmed and automatic to the individual. Behaviour can be altogether subjectively and objectively rational based on the dimension of scrutiny. Subjective rationality underscores the belief pattern and inclinations of the individual while objective rationality emphasises the perceptions ascribed to the intrinsic value of the decision depending on the result of the completed task. This perception suggests that even though some particular medicines cannot treat a certain type of ailment, the truth about its efficacy makes it objectively rational. From a subjective orientation, the belief that a medicine can cure a disease is adequate and indubitable evidence of its disease-curing competencies. The preceding analysis offers the basis for outdooring 'qualifiers' to illuminate the almost baffling difficulties linked with the notion of rationality.

To start with, objective rationality claims the suitable behaviour for ensuring the greatest advantage in a specified condition. Furthermore, subjective rationality points to attaining the maximum rewards from the viewpoint of the people concerned. Yet still, conscious rationality identifies a scenario where the outcome and mean tension is a cognitive course. Finally, deliberate rationality situates a scenario that individuals totally occupy their psychology in exemplifying a certain behaviour. It must be pointed out that altogether these distinctions of rationality can show up in contemporary organisations. It can soundly be argued that there is the prospect for social agents to undertake operations without the consciousness of the fundamental aim for their action. Rationality in an organisation involves the systems of structures and procedures for amending and inspiring tolerable behaviour together with the techniques and methods for their creation, thus making rationality altogether a process and consequence of individual, group and organisational commitment. The rationality of the individual member in the organisation can have an enduring consequence for their loyalty within the framework of the organisation's endeavours.

5.2 Understanding organisational loyalty

It is vitally important to recognise the means by which social agents progressively, albeit fairly reliably, become associated with the issues of the organisation. Fundamentally, the organisation's aims are enforced on individuals in the course of administering authority and control. Regarding organisational discourse from the viewpoint of administrative theory could shed light on crafting a conceptual outline that could shape our opinions of mediated control. Administrative theory assists in the clarification and explanation of the means by which individuals get to be assimilated and turn out to be deeply attached to the organisation in unalloyed loyalty. This loyalty to the organisation, as Simon suggests, derives its origins from a couple of different patterns of behaviour of individuals. Tendency in the

direction of an obligation to 'the service of the organization' and an 'attachment to the conservation and growth of the organization itself' ([19], p. 278). The course through which employees in organisations acquire 'organisation personality' pretty unlike their individual personality is ...through his subjection to organizationally determined goals, and through the gradual absorption of these goals into his own attitudes ... ([19]).

The aforementioned quote entails a means whereby the organisation apportions explicit roles to individuals and recommends the principles, beliefs, choices and facts against which their judgements, choices, decisions and actions in the organisation should be moulded and recognised. Minimising the options within which a person's actions are to function, the organisation—to a logical degree—restricts the tests and possibilities of his judgements and actions to a manageable extent. Forfeiting a person's own predilections plus subduing one's private values in an attempt to follow organisational demands may be mentally trying. It provides the scenery of two divergent forces drawing the individual apart, each requiring similar attention.

The vigorous tussle can lead to the individual preferring either his private inclinations, morals, decisions or largely overlooking the training in respect to the requirements of his role. However, Simon notes that as soon as the frame for actions and decisions has been determined, a person is left with but one 'best' alternative that mirrors the values of the organisation and situational exigencies. Ignoring the prospect of accounting for a person's intentions in the final decision-making and ultimate action could diminish any hints of discretionary choices of the individual in matters of their benefits.

Admitting the limits on his own exposition, Simon observes that there are occasions when a person might not work to the benefit of the organisation, whereby 'personal motives reassert themselves, and the organisation, to that extent, ceases to exist' ([19], p. 283), at that material period when the judgement and the probable consequent action are considered. As a result, the individual trades the scale of values of the organisation for their private one as the crucial benchmark for the relevance of his decision. A considerable and leading avenue of administrative behaviour by which a person mentally joins their emotions with the purpose of the organisation is identification. Identification can result in a condition by which 'a person identifies himself with a group when, in making a decision, he evaluates the several alternatives of choice in terms of their consequences for the specified group' ([19], p, 284).

It seems reasonably sound to report that identification is a needed tool for group solidarity. The psychological devices for explicating the identification experience, per Simon's view, goes under three separate groupings of personal interest in organisational success, transfer of private-management psychology and focus of attention. These distinctions are taken one after the other to demonstrate their corresponding zones of logical concentration. Individual interest in the triumph of the organisation as a result of loyalty to it thereof is driven by personal motivations. Personal motives are not the only reason for a person's established relationship with the organisation but also 'the growth, prestige or the success of the organisation itself'. These afford sufficient chances for enhanced compensation, upgrade, manpower progression plans and the application of superior obligation so that a person looks over and above the difficulties and unfavourable situations linked with his job functions. In view of this, a more profound sense of engagement grows with troubling conditions to attain the complete specified goals of the organisation.

The shift of private-management thinking empowers the individual in the organisation to recondition their mentality and regard the organisation as theirs.

The transfer in mental attitude drives people in the organisation to employ such personal pronouns as 'my' unit, 'my' group, 'my' business, etc., a suggestion that they have a stake in the worries of the organisation as well as in its ambitions and beliefs. The application of these grammatical constructs also serves the indication that organisational members possess a shared fate since they possess a communal sense of 'ownership'. Focus of attention, as a tool of mental proof of identity, leads the administrator's endeavours at those beliefs and those people within the organisational outfit who are expected to be not obliquely affected by the administrative agenda. In short, focus of attention reassures the subordinate to modify what they do towards the goals and targets of the organisation.

Considered against these viewpoints, identification provides an operative means for regulating persons and groups in the organisation so as to build their welfares, desires and individual proclivities in the direction of the organisation's general targets. The planned tools of the organisation for identification permit for extensive redesign of the organisation to normalise and guide the operations of persons known to be contributors to the full organisational processes. Therefore, this promotes rationality to go further than the constraints brought upon it by a diminished span of attention.

6. Final thoughts

As a lens for analysing the dynamics of administrative behaviour from the standpoint of organisational mediated control, this write-up has considered the diverse and searching views offered by administrative behaviour on the matter at hand. The piece surveyed the mechanics of organisational influence, emphasising the approaches by which authority is constituted and applied. Training was observed as a tool for both influencing behaviour on the one hand and an avenue for permitting discretionary opportunities on the other, all aimed at facilitating enhanced job performance and organisational efficiency.

The closing segment then concentrates on the psychology of administrative behaviour by drawing comprehensively on such notions as rationality and organisational loyalty and how they impact shared collaborative endeavours in technology-mediated control. Together, these interweaving impressions disclose the variety of understanding probable to be acquired by examining some of the critical facets of administrative behaviour. The philosophical explanations put forward by the theory of administrative behaviour etched naturally from the discussions of Herbert A Simon proffer a favourable and thorough framework for probing mediated control from the viewpoint of organisational discourse. It remains the wish of this piece to have an empirical data the juxtaposition of which should tease out the different dimensions by which organisational efficiency, allegiance, meaningful interaction and dynamic relationship between the organisation and its external world are brought to bear on its normal operational endeavours.

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