“The impact of Dynamic Capabilities on Firm Performance with moderating role of Top Management Attitude and mediating role of Dynamic Talent Capability: A case study of Big Data Environment”

Submitted By
Hira Shafqat
Abstract

By integrating big data analytics, companies can improve their strategies. Big data analytics can effectively help operations improve efficiency. This helps to increase the company's profits along with performance. Forming the base of Resource Based View in developing Dynamic Capabilities the theory were subsequently extend to form the shape of Service Analytics Capabilities and its impact on firm performance, however this research will examine the potential mediating role of talent capability in reshaping SAC to improve firm performance. In addition to it the Moderating role of Top Management Attitude (toward adoption of analytics) between BDA and Firm Performance will also be evaluated. The model were tested on data analysts working at Telecom sectors of Telenor and Mobilink (located at the headquarters of Islamabad in Pakistan). A questioner was recorded from respondents and the data was analyzed using SMART PLS 4.0 software. The technique is applied to find the relationship between independent and dependent variables with the help of moderating and mediating effect.

Keywords: BDA (Big Data Analytics), RBV (Resource Based View), DC (Dynamic Capabilities), SAC (Service Analytics Capabilities), Talent Capability, Top Management Attitude.
Chapter 01

Introduction

Introduction:

Big data is an opportunity to change the rules of the game today, facing unmatched challenges. Thus we reside in an age of big data (Mikalef, Pappas, Krogstie, & Giannakos, 2018). It has grasp the attention of practitioners and scholars and is still emerging (Wamba, et al., 2016). Big Data Analytics is defined by Wamba, et al., 2015 as a complete adoption of management, processes and analysis of 5V dimensions of data-related i.e Volume, variety, velocity, veracity and value, which enable actionable ideas for value creation, performance measurement and gaining competitive advantage. Because of big data, service analysts now know more about their customers and provide solid insights for improved decision-making and better performance (Kiron, Prentice, P.K, & R.B, 2014). Business analytics is the fastest growing industry and till 2020 it is forecast to grow to $22.8 billion (Gartner, 2018). Although it’s not a very new idea, Analytics is possible to find references to corporate analytics as far back as the 1940s. Analytics began to command more attention in the late 1960s, when computers were used in decision support systems (Delen, 2014). BDA certainly help HR practitioners to increase analytical abilities and resultantly increase firm performance (Kryscynski, Reeves, Stice-Lusvardi, & Ulrich, 2017). Owing to this importance, challenge of identifying Big Data impact on productivity of services organizations while dependent on the analytics capabilities for service organization is paramount (Akter, Wamba, & Barrett, 2018).

How Dynamic capability differ from normal capabilities:
DC is the ability of an organization to purposefully create, extend, or modify its repository to gain a competitive advantage (Helfat et al., 2009). Dynamic functions / capabilities involves "Complex routines" which enable companies to cope up with rapid changing environments (Teece, Pisano, G, & Shuen, 1997). Dynamic capabilities are essential to promote organizational development in an agile organizational environment (Harsch & Festing, 2019).

**Importance of dynamic talent capability in relation to firm performance:**

Hence these are not the casual or basic capabilities of the firm. In this research we are drawing the importance of dynamic capabilities and subsequently we discuss talent capability as a key driver in innovation and competitive advancement. Here we try to elaborate those organizations Process which deploy and develop key human resources which we define as “talent” and understand the Talent capability as the development of dynamic capabilities (Collings, D, Mellahi, Cascio, & W, 2019)

**Importance of dynamic technology capability:**

Technical or technological capabilities are the ability to analyze infrastructure (for example, networks and application), which has both a direct impact on company performance and an indirect impact through talent capabilities ( Akter, Wamba, & Barrett , 2018). Three main contributing factors of technological capabilities are connectivity of data, modularity by flexibly adjusting to dynamic models and compatibility through cloud based networking and decision based on real time flow of data. (Davenport , et al., 2012; Davenport & H, 2006; Manyika, et al., 2011)

**Importance of dynamic information capability:**
It is defined as the “Company mobilization and deployment of its IT-based capabilities along with resources or co-presented with other resources and features” (Bharadwaj, 2000). The concept of IT capabilities is based on the assumptions that it’s easy to copy resources; however a unique set of features company mobilization will lead to continuous competitive advantage (Santhanam & Hartono, 2003). Firms these days are transforming their information capability by integrating AI and smart technologies which includes BDA along with other firm resources to increase its firm performance (Akter, Wamba, & Barrett, 2018).

**Importance of top management attitude toward adaption of analytics:**

The data analysis use is becoming more and more important in the field of human resource development and common as well. The rise in popularity is accompanied by the ability of HR professionals to effectively leverage data analysis capabilities (King, 2016). The attitude of senior management toward change may have a positive impact on work outcomes and organization Performance and create a positive atmosphere for organizational innovation (Giauque, 2016). Thus here we proposes that that attitude or provide a healthy environment for adoption of analytics by top management would yield a positive effect on overall firm performance.

**Problem Statement**

The present day business environment is fast and rapidly adapting to complex dynamic environment. Rapid changes are taking place which demand firm performance prediction in an accurate and smart manner while having a realistic guide line for future direction, by making use of the modern Big Data Analytics. Thus the role of managers of adaption of analytics while integrating Service Analytics Capabilities must be assessed to know the overall impact on firm performance.
The fact is that we know very little about how big data-driven Service Analytics Capabilities (SAC) are built in data-driven service organizations. We also have little knowledge of the potential role of Talent Capability in facilitating overall Service Analytics Capabilities (SAC) while the impact of both of them on Firm Performance (FPER) (Akter, Wamba, & Barrett, 2018).

Therefore drawing on the dynamic capabilities (DC) approach, this study will investigates the link between SAC and FPER while examining the mediating role of talent capability and the moderating role of manager’s attitude toward adoption of analytics.

**Significance of the Study:**

In the complex era of technology coupled with talent capability firms maximize their profit with many innovation and applied tactics, this made HR practices much more complex and demanding thus it must be aligned in adoption and implementation of analytics in order to retain the competitive advantage coupled with evaluation at every stage (Akter, Wamba, & Barrett, 2018). Analytics becomes an integral part of profit maximization along with calculated and accurate decisions. This study thus helps in examining how analytics could prove vital for managers to take right decisions based on concrete facts and figures while implementation of Service Analytics Capability (SAC) in Big Data Analytics (BDA) environment. In this study we are trying to evaluate Top manager’s attitude encouraging adoption of analytics in firm, affecting the relationship of SAC on FPER. Secondly, we are trying to improve service analytics research by identifying technology, talent and information capabilities as higher order, dynamic SAC, which enhance firm performance. SAC has been defined as the joint effect of Dynamic Technological and Dynamic Information capability along with Dynamic Talent Capability. Besides knowing the importance of
the use of analytics, this study will encourage practitioner to focus more on the use of analytics in different fields as well to take accurate and measured decisions

Research Questions:

1. What is the impact of BDA on firm performance?
2. Does Dynamic Talent Capability mediate the BDA and Firm Performance relationship?
3. Does Top Management Attitude toward adoption of analytics moderate the role of BDA and Firm Performance?

Research Objectives:

1. To evaluate the impact of BDA on Firm Performance.
2. To examine the Mediating role of Dynamic Talent Capability between BDA and Firm Performance.
3. To know the Moderating role of Top Management Attitude toward adoption of analytics between BDA and Firm Performance.
CHAPTER No: 02

LITERATURE REVIEW

2.1 Introduction

This chapter critically reviews firm performance. Starting from its basic definition to the ingredients which are associated with firm performance. Firm Performance has drawn from Resource Based View Theory (RBV) perspective in subsequently. RBV theory is further extended and linked with the Dynamic capabilities. Dynamic capabilities (DC) are then associated with Dynamic Information Capability, Dynamic Technology Capability and Dynamic Talent Capabilities. Technology and Information Capabilities in combination with the formal grounds of Big Data Analytics, is referred as Service Data Analytics Capabilities (SAC). At the end the mediating role of Talent Capability and moderating role of Managers attitude toward adoption of Analytics is discussed in relation to firm performance.
The explanation and evolution of RBV of firm to SAC is depicted below for better understanding:

![Diagram](image)

**Figure 1. Theoretical framework of Research Study**
Firm performance:

Huge literature has contested on the topic of firm performance. We will here first present how it should be seen differently and after that we will narrow it down in the realm of big data environment having special focus on service analytics.

The performance of firm is an important construct, in strategic management study, across the world and often it is applied as a dependent variable (Selvam, Gayathri, Vasanth, Lingaraja, & Marxiaoli, 2016). In spite of its significance, there is hardly any consent about its definition, dimension and depth (Selvam, et al., 2016). Since several different dimensions exist, a researcher has to choose all the dimensions most relevant to the intended relevant research and evaluate the outcomes of this choice (Richard, et al., 2009). The field of Big Data Analytics Environment needs a clear conceptualization of Firm Performance and its different dimensions in a realm of Service Capabilities. The potential indicators for firm performance aspect could be growth performance, market value performance, profitability performance, customers’ satisfaction and employees’ satisfaction, corporate governance performance, environmental performance, environmental audit performance and social performance (Selvam, et al., 2016).

From RBV to Capabilities:

The theory of RBV progresses by utilizing these resources mix into two categories i.e tangible and intangible resources (Kozlenkova, et al., 2014). It is important here not to mix these resources with ordinary resources, since these refer to the strategic resources (Kozlenkova, et al., 2014). As compare to tangible resources intangible are the most important here i.e they are the knowledge and skills that makes the real difference in strategic resource-(Valuable, difficult to imitate, Rare, and non-substitutable) (Kozlenkova, et al., 2014).
This lead to the importance of capabilities based on knowledge, skill and training. Capabilities are required to exploit and manage the resources to provide a value addition which in turn provide a firm or an organization a futuristic lead or advantage on others (Makadok, 1999). Capabilities make the subsets of any firm’s resources, which present “an organizationally rooted non-transferable firm specific resource whose rationale is to advance the productivity of the other resources possessed by the firm” (Makadok, 1999). They are normally information-based, intangible or tangible practices that facilitate a firm to organize its other resources more efficiently hence enhancing the productivity of those resources. Therefore, capabilities are unique types of resources whose purpose is to improve the productivity of other resources carried by the firm (Makadok, 2001).

**From Capabilities to Dynamic Capabilities (DC) and Service Data Analytics Capabilities (SAC):**

Researchers argued that some firms couldn’t maintain competitive advantages in dynamic environments until and unless they reconfigure its resources according to the changing needs (Ambrosini, Bowman, & Collier, 2009). In the same manner, it is asserted that DCs facilitates the firms to create, expand and transform their tactics to ensure their continued existence in fast changing environments (Helfat et al., 2009). DCs enable firms to incorporate, reconfigure, grow and leverage the resources in order to cope up effectively with changing situation and achieve new resource configurations as their markets progress (Vanpoucke et al., 2014). DCs are referred to as higher level capabilities that orchestrate a firm’s resources to enhance firm performance in changing environments (Teece, 2014). DCs enable firms to establish competitive advantages in innovation-driven competition. The foundation of the DC framework is suitable for the current big data environment in which analytics professionals are keen to capitalize on DCs to gain an edge
in the market. We define SAC as a DC since it can generate superior profits by solid insights in a constantly changing multi-channel business environment (Akter, Wamba, & Barrett, 2018).

**Impact of Dynamic Capabilities on Firm Performance**

Dynamic capabilities have a positive impact on Firm performance as suggested by Scholars in different ways (Akter et al., 2018). Like it can increase financial growth with innovative processes while developing and extending distinctive services as compare to its competitors who rest on their ordinary capabilities (Ghobadian, A, Regan, Howard, & G, 2007). Secondly Dynamic Capabilities grasp the speed of changing environmental changes thus it retain dynamic efficiency and effectiveness as compare to other firms (Akter et. al, 2018). Lastly Dynamic Capabilities offer increased options for decision making which result in increases firm performance (Eisenhardt, M, Martin, & A, 2000). Amazon for that matter use data analytics for optimum service performance while linking it to talent capability of service analyst (Sparrow, P, Hird, Cooper, & L, 2015).

**Technology capability, Talent capability and Firm Performance**

Technology as name suggests is the analytics ability infrastructure e.g. network and integrated application. It has the direct impact on firm performance and an indirect impact through the talent capability (Akter et.al, 2018). The Technology Capability forms an umbrella of compatibility, connectivity, adaptability and modularity (Akter et.al, 2018). Connectivity is the linking and analyses of big data from different units. For example, United Parcel Service (UPS) predict customer defection by examining usage patterns and complaints of its customers (Davenport & H, Competing on analytics, 2006). Compatibility is done while using cloud technologies for quick
analysis ease and integrates real time decision-making (Davenport, H, Harris, & G, 2017). For example, Amazon applies collaborative filtering using various customer data to predict ‘you might also want …’ prompts (Manyika, et al., 2011). Modularity is the flexibility of an analytics platform to advance dynamic models while integrating changing opportunities. For example, Wal-Mart developed Retail Link so that suppliers would know when stores should be restocked rather than waiting for an order from Wal-Mart stores (Manyika et al., 2011).

Finally, Privacy refers to the ability of a BDA platform to offer a safe and protected environment for user information. For example, names and addresses, social security numbers, credit card numbers and financial information could be another challenge for big data management. Accordingly, we posit that:

H1: There is a relationship between Dynamic Technology Capability and Firm Performance.

Technology capability conform Data scientists toward technical aspect of big data firms and thus developing and enhancing technical skills (Akter, Wamba, & Barrett, 2018). For a dynamic firm, which requires greater analytics capability, enhancement of technology capability is must for data scientist so that in uncertain business or corporate strategies they can flexibly adapt to it (Akter, Wamba, & Barrett, 2018). For example, citing the impact of technology capability on talent capability, Davenport (2013, p. 67) states that ‘innovative technologies of many kinds had to be created, acquired, and mastered … To complement them, new “agile” analytical methods and machine-learning techniques are being used to produce insights at a much faster rate’. Thus, we hypothesize that:

H2: There is a positive relationship between Dynamic Technology Capability and Dynamic Talent Capability.
Information Capability, Talent Capability and Firm Performance

Information capability is the ability of providing precise, comprehensive, organized and up to date information fulfilling the changing business needs and direction (Akter, Wamba, & Barrett, 2018). For example, Netflix provide robust information to customer regarding movie preference by having feedback over one billion reviews (Akter, Wamba, S, & F, 2016). With the use of solid information in BDA environment provided by technology, we can have valuable insight and enhancement of analytical ability thus results in high firm performance (Davenport, et al., 2012). It is therefore important to know the components of technology and information enhances data analytics capability in data economy. Thus, we hypothesize:

H3: The relationship between Dynamic Information Capability (DIC) and Firm Performance is positive.

H4: The relationship between Dynamic Talent Capability and firm performance is positive.

The mediating role of Talent Capability:

Although talent capability can be define in many ways, here we will be specific to analytics in BDA environment. Therefore, Akter, Wamba, & Barrett (2018) defined it as service analyst professional ability to perform designated task in BD environment. These scholars further argue for effective utilization of BDA, recruitment and retaining of frontline employees with talent capability is very important as they bridge technology and firm performance. Talent Capabilities are the Technical and Technological ‘know-how’ and other types of knowledge that can create or sustain competitive advantage (Constantiou, D, Kallinikos, & J, 2014). Technology therefore form a base line for analytics supporting firm performance, but it should be linked with right talent to have a thorough insight.
Seeing the role of Dynamic Talent Capability in Dynamic Technology capability, which enhances firm performance, we get sufficient evidence of talent capability role in information capability and firm performance from literature (Akter, Wamba, & Barrett, 2018). Service analysts should be empowered with statistical, contextual and cognitive skills, and other related knowledge so that they can turn data into solid insights for customer service (McAfee, A, Brynjolfsson, & E, 2012 and Kiron, et al., 2014). Service analysts can make critical decisions looking at predictive models to attract and retain customers (Ransbotham, Kiron, Prentice, & K, 2015). Thus, we put forward the hypothesis:

H5: Dynamic Talent Capability will mediate the role of Dynamic Information and Dynamic Technology capability with Firm Performance in Big Data Analysis (BDA).

**The moderating role of Top Management attitude:**

Top management attitude plays an important role in self-adoption of analytics and promoting the same culture from top to bottom for enhancing of not only talent capability but also integration of information readily available to make decisions easily and keep firm in line with the outcome and direction which is the firm performance (Akter, Wamba, & Barrett, 2018). Therefore adoption is defined by Rogers (2003) as, ‘Adoption is a decision to make full use of an innovation as the best course of action available’ (p. 177). When HR professionals make better decisions, appropriately initiate change, identify important upcoming trends, and integrate well with the other business functions, they likely create more value for the business (Vargas, et al., 2018). They are also likely to be seen as valuable business partners not only within HR but outside of HR as well (Vargas, et al., 2018). Accordingly, we expect that HR professionals with higher analytical ability will receive higher job performance ratings (Kryscynski, Reeves, Stice-Lusvardi, & Ulrich, 2017). HR
managers with higher BDA capabilities certainly have higher job performance and resultantly higher firm performance (Kryscynski, Reeves, Stice-Lusvardi, & Ulrich, 2017).

Top management attitude toward adoption of analytics is the step toward innovative and integrative capability (Vargas, Yurova, Ruppel, Tworoger, & Greenwood, 2018). An innovation as defined by Rogers (2003, p. 12) is ‘an idea, practice, or object that is perceived as new by an individual or other unit of adoption’. He further expanded the application of the decision-making process to acknowledge that the lapse of time since discovery of innovation is irrelevant as far as the individual making the decision is concerned. If it is new to the unit of adoption, in this case individuals, then they will behave in ways consistent with it being new to them individually (Rogers & M, 2003). Applying this logic Marler and Boudreau (2017) classified HR Analytics as an innovation to most individuals and organizations. Analytics is more complex since knowledge and skills are needed in each of the multiple steps such as collecting appropriate data, developing models, conducting analysis, and interpreting results are also needed (Vargas, Yurova, Ruppel, Tworoger, & Greenwood, 2018).

Thus we hypothesize that:

H6: Top Management Attitude toward adoption of analytics will have significant impact to moderate the association between Service Analytics Capability and Firm Performance in BDA Environment.
Research Model:

Figure 2 Research Framework Model

This figure shows the positive relationship of independent Variables (Dynamic Technology Capability and Dynamic Information Capability) with Dependant Variable (Dynamic Technology Capability). While Dynamic Talent capability is taken as mediator between IV and DV. Top Management Attitude is taken as moderator between Service Analytic Capabilities (Dynamic Technology capability, Dynamic Information Capability and Dynamic Talent Capability) and Dynamic Technology capability.
Hypothesis:

H1: There is a relationship between Dynamic Technology Capability and Firm Performance.

H2: There is a positive relationship between Dynamic Talent Capability and firm performance.

H3: The relationship between Dynamic Information Capability (DIC) and Firm Performance is positive...

H4: Dynamic Talent Capability will mediate the role of Dynamic Information and Dynamic Technology capability with Firm Performance in Big Data Analysis (BDA).

H5: Top Management Attitude toward adoption of analytics will have significant impact to moderate the association between Service Analytics Capability and Firm Performance in BDA Environment.
CHAPTER No: 03

METHODOLOGY

Introduction

This chapter will explain research methodology of the study. This chapter begins with setting up design and philosophy of the research, approaches adopted methods and techniques to be used and research setting. This chapter will also explain measures to be used in the study.

Research Design

The methodology of this research would be based on the research design to explain a processes and plan of investigation to get the output which is aligned with the research questions and the objectives. The research design is further focused to deal with the methodology of data collection, time dimension and the role of the current research (Cooper & Emory, 1995). The research design of the current research is further elaborated in the light of research onion (Saunders, 2011).

Figure 1 Research Onion (Saunders, 2011)
**Philosophy**

The philosophical stance is highlighted as a first layer in the research onion. Positivism is a philosophical stance which deals with the extension of knowledge by creating a research question or propositions and measured the results on the basis of the data (both primary and secondary) to achieve the desired objectives of the research. Here we will follow positivist approach by testing the hypothesis based on previous literature and in addition to it making it fit in the business analytics context.

**Approach**

The approach used in the current research is deductive method approach in which research questions or research propositions are taken to find out the results. The process shifts from the existing literature to the research questions or research objectives, to the process of data collection and to explain the results of acceptance or rejection of the research questions.

**Strategy**

The strategy adopted in the current research would be survey based strategy which deals with the research questions or objectives for diagnosis the actual problem and to collect the data for further analysis. Survey is also related with the deductive method approach and the most economical method for the purpose of data collection (Sapsford, 2007). Furthermore, the methodology employed in the present research is mixed method in which both quantitative and qualitative methods are used in order to fulfill the philosophical stance, approach and the choices.
**Time Horizon**

The current research is also based on the time horizon and deals with the cross sectional data which is collected on the same time of span. In this regard, the primary data will be collected from 2 Telecom sectors i.e. Jazz and Ufone based in Islamabad, Pakistan.

**Population**

The entire group of specific elements relevant to the current research is explained as the populations (Zikmund, Babin, Carr, & Griffin, 2013). The population of the current research includes managerial post employees dealing with analytics posted at Telenor, Jazz and Ufone Headquarters, Islamabad, Pakistan. Which are 150 in total approximately.

**Unit of Analysis**

In the current research, individuals at the post of managers and using analytics or supports its use are taken as the unit of analysis. Specifically, the primary data will be collected from the managers at the Headquarters of Telenor, Jazz and Ufone in Islamabad.

**Sample Size**

The sample size is the number of observations taken from the target population (Zikmund et al., 2013). Here the observations would be the Questioner distributed among data analyst managers. This sample is taken to further analyse the collected data in the current research.

**Sampling Technique**

The simple random sampling is the best technique employed to generalize the output of the collected data (Sekaran & Bougie, 2013). According to (Christensen, Johnson, Turner, & Christensen, 2011), the simple random technique is used in the current research where an equal chance of each element of target population is accepted in the sample.
Measurement

The present research is based on qualitative as well as quantitative research and measured on the basis of primary data. The qualitative data will further be measured through the coding method and the quantitative data through PLS smart software.

Instrument

All the study variables, will be measured on a 5 point Likert scale ranging from Strongly Disagreed=1 to strongly agree=5.

CHAPTER 4

RESULTS AND ANALYSIS

Result will be complete after the analysis.

Chapter 5

Discussion and Conclusion

Findings of the five hypothesis are formulated in this study, all the hypothesis were tested against the variables moderator among independent variables and dependent variable. In above study three independent variables have been taken i.e. dynamic information capability, dynamic talent capability and dynamic technology capability while the dependent variable was firm performance.
References


