Organizational Innovation Performance Through Big Data Analytics with Moderating Role of Management Accountant

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ABSTRACT

The purpose of this paper is to contribute to the literature on the impact of Big Data Analytics Capabilities (BDAC) on the Organizational Innovation Performance (OIP) with the role of Management Accountant as a moderator. By carrying out a literature review, this paper provides information for researchers and scholars to explore the emerging trends and implications of the above-mentioned relationship. A literature review highlights the emerging issues from the research conducted on Organizational Innovative Performance, Big Data and the role of Management Accountant in this relationship by focusing on: role of OIP, the importance of Big Data from the technological to the managerial paradigm as well as the role a Management Accountant can play in the era of Big Data. It is expected that identifying these contributions will help establish future research directions. A conceptual framework at multiple levels shows how Big Data impacts the organizational innovative performance through the role of management accountant as a moderator. This involves the focus to shift from almost standardized approaches to developing big data analytics capabilities without contextual focus to approaches which are much more heterogeneous in terms of being more related to each organization and hence are more focused towards the context in which they are considered.

Keywords:
Big Data Analytics Capabilities; innovation performance; management accounting; management accountant

1. Introduction

Innovation has become the core pillar of achievement for every organization in the current business world [1,2]. The speed of innovation can be increased, possibly, by rapidly changing technology, a high rate of product development and shorter product life cycles, which in turn, would bring about changes in the nature and type of economic development [1]. Innovation is considered an integral part of organizational strategies, meant to achieve sustainable competitive advantage within the market [2].

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The contemporary time period is considered as the age of big data as newer data is being produced at an unprecedented rate, from all organizations, industrial sectors as well as public organizations and bodies [3]. The exponential growth in the volume of data has resulted in big data being considered as the key source of competitive advantage, business performance and innovation [1, 3-6]. At present, over 3.2 billion people, of the world's population are connected onto the internet with 46% of them being connected through the usage of smart phones [7]. Furthermore, this massive shift of IP traffic (web traffic, flow of data across the internet) from fixed networks to wireless based networks is likely to lead to a number of challenges for organizations. It is forecasted that global mobile data traffic from 2017-2022 (in exabytes per month) is from 11.51-77.49 [7]. By 2050 these figure are likely to be 95% of world population [8]. One estimate is that the amount of global digital healthcare data will explode from 500 petabytes in 2012 to 25,000 petabytes in 2020 [9].

Organizations are required to analyze, in a meaningful manner, structured as well as unstructured data in order to obtain deeper insights into customer related behavior, their service usage as well as interests on a real-time basis [3,10] to enhance business performance, competitive advantage and innovation. Due to the rapid increase of data volume, variety, velocity and veracity, considerable developments have taken place and have also been documented, relating to such technologies and techniques which involve the analysis, visualization as well as storage, of data [3]. Many organizations of different sizes are searching for ways with the aim of improving their performance, innovation and business value, by extensive usage of big data analytics (BDA) tools [3,11,12]. The pharmaceutical industry is essentially defined by innovation [13]. Research on the forefront of science, the creation of new knowledge bases, and the invention of new medicines, and the improvement of existing drugs constitute the fuel that propels the firms in this industry. According to Petrova [13] continuous innovation is one of the pharmaceutical industry's most defining characteristics.

The global pharmaceuticals market size is expected to gain market growth in the forecast period of 2020 to 2025, with a Compound Annual Growth Rate (CAGR) of 3.1% and will expect to reach USD 1114470 million by 2025, from USD 987790 million in 2019 [14]. According to IQVIA [15], a United States based firm which focuses on health market research, Pakistan's pharmaceutical industry as well as market, are amongst the top 3 fastest growing ones in the world. Pakistan's domestic pharmaceutical firms' sales have achieved a CAGR of 13.1% over the last 4 years, hence outperforming the multinational companies (MNCs), which had achieved global growth rate of 9.34% compounded annually. Pakistan's pharmaceutical sector is growing at a faster rate than the other emerging markets like India, Brazil, Russia, Vietnam and Bangladesh [15]. The local companies in pharmaceutical sector in Pakistan have achieved quarterly revenues of Rs. 320 billion in the quarter ending March 31, 2020, as compared to Rs. 195.75 billion of the MNCs, as of March 31, 2016 [15]. Pakistan exported $217.04 million worth of pharma products during 2019, according to the United Nations COMTRADE [16] database on international trade.

Despite the facts mentioned above regarding positive trends in Pakistan Pharmaceutical industry, there are some harsh realities. Due to the high depreciation of Pakistani rupee, the overall growth of the industry in terms of the US dollar, remained negative, in the first quarter of the year 2020. As per a report [15], in the previous four years national companies CAGR was 2.41 % as compared to MNCs which had a 1.01 %.

Rate of contraction reduced the period from July to March in financial year 2020 in this sector as per Pakistan Economic Survey of 2019-220, 5.38% reduction found in that time period as compared to 8.66 % reduction in previous years [17]. Also, the pharmaceutical sector had the highest recorded sales in March, as well as receiving $1.3 million in the form of foreign direct investment (FDI) in April 2020 [17]. As per Pakistan Economic Survey Survey [17] there is an analysis by experts that, due to

the increasing current rate of growth, market size of pharmaceutical sector would be double in the coming 10 years.

In the coming months, there would be a severe impact of the COVID 19 pandemic, and the International Monetary Fund (IMF) has conducted a downward revision of its projections related to the world GDP projections and is currently expecting a 4.9 percent contraction in 2020. High rupee depreciation and impact of the pandemic is giving tough time to Pakistani economy and the next year will likely be quite difficult for the Pakistani economy [18]. GDP of Pakistan is also precarious as the expected growth rate for the next fiscal year is likely to be between 1 and 2 percent, which is considerably less than the normal growth rate of between 3 and 5 percent which has been seen in the past [18]. Pharmaceutical sector as it is one of the more innovative sector and a very crucial one for the economic performance of the country [19]. According to Javed [18] few industries, which include the pharmaceutical industry of the country, could play a very important role in helping the national economy. Javed [18] suggested, that the pharmaceutical industry should increase their production capacity, because international collaboration will bring critical projects for important medicines in the country and should focus on setting up joint ventures related to investments in the production facilities in order to improve the GDP. Innovation in pharmaceutical sector is under pressure yet [13]. To gain business value and competitive advantage it is required that innovation should be sustained in pharmaceutical industry [19]. Unfortunately, Pakistan ranking in the bottom line of worst 16 countries out of a total of 121 countries[20]. Pharmaceutical companies are operating in a very technological sector where some of the most important areas for the improvement of firm performance are the management capabilities, critical information analytics and innovation [19].

Number of studies emphasizing that, organizations have access to an avalanche of data management and data analysis tools, which we collectively designate as "big data" and "analytics" technologies, respectively [21-24]. The combination of these tools and the amount of data available has led to golden opportunities for hospitals, public health departments, and corporations to develop and deploy a wide variety of business intelligence and analytic applications to support multiple organizational objectives [21]. Through the use of business intelligence and analytical tools, this newly acquired capacity for analyzing detailed data enables healthcare providers and other data owners to pursue a myriad of clinical, operational, and financial innovations.

The prevalence of big data and the usage of the same can result in enhancement in innovative performances, which then leads to further improvement in economic development [1,25]. In other words, innovation, which can be termed as the implementation of creative ideas within the organization, in a very efficient and effective manner, can and does lead to businesses achieving and sustaining competitive advantages [1,2,26].

Empirical research relating to the business value of the BDA is currently in a very early stage. This is quite strange considering the increasing number of companies which are investing heavily in big data[27,28]. A number of reports, to date, on the topic of business value of big data have been from popular press, consultancy firms, and individual case studies which are lacking in theoretical insight [29]. Consequently, there is a little understanding of how organizations need to focus on their initiatives related to big data, and also there is little empirical support to claim that such investments actually do create any business value worth measuring [24].

A number of studies focusing on importance of BDA Capabilities with the reference of management to create applicable or practicable ideas for delivering sustained value, enabling innovation performance measurement, and achieving competitive advantage [22,24,30]. Due to increased usage of innovative technologies, BDA has become the fourth paradigm of science which has given solutions to the management relating to the analyses of complex data and datasets[31, 32].

According to PWC's report From Vision to Decision Pharma 2020 PWC [33]*,* there are three fundamental challenges faced by the pharmaceutical industry. Firstly, increasing customer expectations. The economic and commercial environment is getting more difficult. New cost constraints are being imposed by the healthcare payers on the providers, with the value of the medicines being scrutinized much more carefully by these payers. They require newer therapies which are economically and clinically much better than the present alternatives, as well as, factual, real-world outcomes related data, to support any claims about the superiority of a medicine. Secondly, low scientific productivity. Pharma's output has become flatlined for the last decade. However, the processes being used to discover and develop newer products have remained very much the same.

Organizations need to focus on the relationship between BDA Capabilities and the effect on innovation, based on the assumption that management is able to make the best choices from the different options when faced with insight obtained from data generation. Additionally, it would be quite possible that decisions may not be based on any big data related intelligence, because there could be a number of other factors which affect the management's decision of adopting or otherwise, any data-generated insight [3]. This area of research carries a lot of potential, as the generation of big data perception very close to attain value in business and also how management who has specialized business knowledge can use this data is critically important for organizations to improve the decision making for competitive performance and business value to enhance innovation performance [29]. According to Lawson [34], many existing functions and roles of professionals are being changed in terms of their requirements as well as their scope. The usage of different technologies in the field of IT related to big data has resulted in radical changes being made to businesses as a whole [34]. The accounting and finance profession is no exception to it [34]. According to Lawson [34] within this profession the scope and need of the management accountant is also going through radical changes.

However, it is not just the big data that is important. It is the ability to convert that data into meaningful information and then be able to use that Information to deliver what is needed in order to create and enhance business value [34]. This is leading to newer opportunities for management accountants to learn new things and new skills and hence develop newer expertise [34-36]. Even before the existence of big data, the crucial role of the management accountants had always been that of value creation which is primarily related to the formulation of strategy as well as the analysis, planning and execution of those strategies' performance [35,37,38]. With better decision making, and much better and detailed data analytics coming into play, the management accountant will be increasingly able to enhance organization wide value creation [39].

Hence the role of the management accountant in the new age is one of a bridge between the data scientists , analysts and the business executives [34]. On their own, the data scientists have the ability to do their technical work but they lack the understanding of the relevant domain as well as knowing which questions to ask in which scenario(s) [40]. At the same time, the business executives on their own will not be able to fully understand the true potential of the data analytics. The management accountant acts as a bridge between these two while adding value for enhancing innovation performance with the help of new skill sets [36].

The utilization of big data has created a revolution in different industries like telecommunications, healthcare, advertisement, and finance [41]. As global healthcare spending is expected to grow at an increasing rate, a large number of opportunities are likely to exist for this sector [15]. Despite all the uncertainties, there is a need to navigate these. This can be done by taking into account the historic and current drivers of change when developing strategies for 2020 and beyond [15].

There is need to investigate effect of BDA Capabilities on innovation in contextual and market-specific conditions [3]. By analyzing information obtained from social media, demographics, electronic medical records, and other sources of data, it is possible identify newer, niche, and underserved markets [28]. Analysis of the effectiveness of the sales efforts as well as using the feedback obtained by the sales force during their visits to the clients and using it effectively can go a long way in helping the pharmaceutical companies gain a competitive edge, business gains and innovation performance [28].

It is vital to understand how BDA Capabilities are developed within high innovative industry, as well as understand the mechanisms through which the BDA Capabilities produce value, and how such value can be obtained [42]. This area needs to be addressed in the pharmaceutical industries as well [28,41]. It is of considerable practical value, especially innovation, taking into account the costs of using initiatives related to big data. Therefore, BDA Capabilities in relation with innovative performance is an important area in pharmaceutical industry in Pakistan. Furthermore, whether management accountants will play potential role in BDA Capabilities is worth to be investigated.

2. Problem Statement

Current situation of the outlook for Pakistan GDP is hazardous with growth rate is expected to be only 1-2 % for the next fiscal year as compare to past which was 3-5% [18]. Increasing trend of depreciation of rupee, new contraction 4.9 % in 2020 by IMF and impact of pandemic, pushing downward GDP of Pakistan [17]. An ability of an economy to increase in productivity with the help of factors of production is referred as economic growth [43]. In current situation where economy of Pakistan is in difficult phases Javed [18] said, pharmaceutical sector will play an important role to boast the economy with foreign investment in international joint venture. With the help of innovation performance pharmaceutical sector and increase in production capacity and attract the international collaboration [18].

The pharmaceutical sector has been successful for decades. The pharmaceutical sector is now facing few challenges and due to that, companies are forced to rethink their strategies. Due to the increasing accessibility to healthcare services, there are doors opened for the pharmaceutical industry players to a broader their target market. Such emerging markets are becoming crucial for pharmaceutical companies. One of the biggest challenges in the pharmaceutical industry now is to shift from a sales and marketing-based model to an access driven commercial model. The commercial atmosphere in the pharmaceutical industry is only getting harder and ruthless. Also, in recent times, healthcare analytics is facing a data evolution. As the pharmaceutical industry becomes increasingly complex and globalized the sector must become more cost efficient [28]. The biggest challenges faced by the industry is the complete freezing of prices of pharmaceutical products in Pakistan, demand forecasting, price fluctuation assessment and risk assessment [44]. The price mechanism set by the government since 2001 has not allowed the pharma industry to increase prices of even those drugs whose costs have gone up by more than a 100 percent, whereas the price of inputs such as fuel, electricity, labour wages and raw materials have increased drastically making the survival of the industry very difficult. There were 36 MNCs working in Pakistan in the early 2000s in the sector, that number is now down to about 22 [44] . That is an eye-opening number of exits. In recent times the situation has become worse as most of the raw material is imported and any increase in dollar rates adversely affects the profitability of the local manufacturers [18].

Pharmaceutical companies are operating in a very technological sector where some of the most important areas for the improvement of firm performance, competitive advantage and business gains are the management capabilities and innovation [19]. Unfortunately, Pakistan is

currently facing low Annual Global Innovation Index as per GII [20] as compare to other, which identifies regional leaders India, South Africa, Chile, Israel and Singapore, with China, Viet Nam and Rwanda. It is crucial for Pakistan, that manufacturing industries specially pharmaceutical industry needs to sustain and improve innovation performance to enhance competitive advantage and business gains for economic development [17]. The pharmaceutical industry contributes approximately **1%** to the GDP of Pakistan annually [45]. To increase GDP and attract foreign investment, Pakistan pharmaceutical sector needs to improve innovation globally [46].

Innovation performance has recently been under examination because it is associated to competitive advantage, business gains and economic performance of the country [1, 2, 26]. It is increasingly important for pharmaceutical companies to understand the requirement for core BDA Capabilities which create different values for them, particularly as they tend to increase their investments in this area to gain innovation and competitive advantage [28, 41, 45, 47]. Many researches which show that use of BDA Capabilities can generate considerable value when applied to problems in particular domains like supply chain management, marketing, health care and manufacturing industries [28, 45, 48-50].

BDA develops on the previous work by suggesting that actionable insight can be obtained by analyzing large volume of data from different industries perspective, thereby helping the businesses to transform themselves and hence achieve innovation performance as competitive advantage [3, 22, 28, 41, 51, 52]. For more generalizability in industries contextualization there is a need to search on innovation with respect to BDA Capabilities in pharmaceutical sector which is highly innovative industry and contributing in economic development [33, 41, 53].

There is limited research is available, related to BDA Capabilities which would indicate the importance of different resources within different contexts and how the combinations of context and resources can lead to enhanced innovative performance in the pharmaceutical industry [28].

A variety of jobs in the management accountant's domain of working are changing [36]. A recently conducted IMA Pulse survey carried out by ACCA (Association of Chartered Certified Accountants) and IMA (Institute of Management Accountants) has indicated that 42% of the Management accountants fear job loss while another research conducted by Forrester Research Inc. forecasted that 72% of the jobs in management, finance and business may be lost by 2020[34]. The strategic involvement of management accountants in the decision-making process for attaining competitive advantage and improving business performance [35, 37, 38] usually requires an understanding that new set of skills is required from such management accountants. It is understood that in the current environment of big data, where modern technologies are involved in the transformation of business processes and hence attainment of business value, the role of the management accountants also needs to be investigated in relation with BDAC and OIP [55, 56].

Most of the studies done so far on area of BDA Capabilities assume that organizations which develop such capabilities tend to focus on the same approaches and hence they lack heterogeneity [3, 22, 57] . At the same time, empirical studies are derived from the understanding that resources for building BDA Capabilities are of equal importance, without considering different contexts, process oriented dynamic capabilities and role of management accountant [3, 22, 57].

2. Research Questions

The study aims to examine the following research questions:
1. To what extent BDA Capabilities affect OIP?
2. How the role of Management Accountant (MA) moderates the relationship between BDA Capabilities and OIP?

3. Significance and Scope of the Study

This study contributes to the knowledge within the domain of BDA Capabilities and innovative performance theoretically, practically as well as methodologically. There are a number of ways in which this study will contribute theoretically to the body of literature. Firstly, this study, focuses not only on the effect which BDA Capabilities is likely to have on the organization's innovative performance but also considers the effect which components of the BDA Capabilities are likely to have on the innovative performance of such organizations. These components include the constituting BDA Tangible Capability, BDA Intangible Capability and BDA Human Skills and Knowledge Capability.

Similarly, the study of the role of management accountant is also very important because the management accountant forms the bridge between the data scientists and the business so that relevant information is obtained and provided to the decision makers. As a result, thirdly such a moderating role of management accountant is also considered in this study.

There are practical contributions from this study as well through provision of guidance to the professionals in the industry, top management, the decision makers of the relevant organizations, to the industrial sector of Pakistan in general and high innovative sector like pharmaceutical sector of the country in particular. It will also provide guidance for innovative organizations as to how they can use big data to further enhance their innovative performances and hence be able to create more value for their business. As this study involves the impact of Big Data as well as its components, constituting BDA Tangible Capability, BDA Intangible Capability and BDA Human Skills and Knowledge Capability on the innovative performances of the related organizations.

At the same time, organizations will be able to understand the roles which have to be played by the data scientists who need to apply their knowledge, skills and expertise to the related data sets and understand how to obtain the related information. By practically applying this study, organizations will also be able to understand the role of the management accountants and how they can form the bridge between the data scientists and the businesses in order to understand the information requirements of the business and how the data scientists can provide the relevant information via the analyses of the big data.

Finally, the data in this study will be analyzed via latent variable structural modeling using the method Partial Least Squares (PLS) path analysis. The PLS method will be used in this study is relatively novel within BDA Capabilities research. It can handle both reflective and formative measures, offers a more comprehensive view on the relationships in the framework and allows testing causal models with multiple independent, moderating and dependent variables with multiple indicators or measures [58-60]. As such, it contributes to methodology development in the BDA Capabilities and innovative research field.

4. Literature Review

Literature has been extensively reviewed on the relationships in this study so as to develop a sound foundation of the framework. The framework of this research study and relationship among the selected variables lays its foundation on the integration of two famed and largely recognized theories that is resource-based theory and socio-materiality theory. Thereafter the model of this study will be tested empirically.

4.1 Innovation Performance

"Industrial innovation includes the technical, design, manufacturing, management and commercial activities involved in the marketing of a new (or improved) product or the first commercial use of a new (or improved) process or equipment" [61] (p.9)"Innovation is the specific tool of entrepreneurs, the means by which they exploit change as an opportunity for a different business or service" [62] (p.10). Organizational Innovation performance in current study is defined as the creation and implementation of new processes, products, services and methods of delivery which result are developed in outcomes, efficiency, effectiveness or quality [63].

4.2 BDA Capabilities

According to [3], Garmaki, Boughzala [64] the BDA Capabilities helps in mobilization and deployment of BDA resources effectively, utilization, constitution of BDA Tangible Capability, BDA Intangible Capability and BDA Human Skills and Knowledge Capability and support BDA planning through organization's long term strategy to attain competitive advantage and enhance innovation performance. For the current study the concept of BDA Capabilities is suggested. Its general definition is taken as an organizational capability to provide insights into the use of data management, infrastructure, and human capabilities to convert business into a competitive force [65, 66].

4.3 Management Accountant

Management accountant's role is carried out in current study, from clerical role to strategic partners in businesses [67, 68]. Currently, the primary focus of these accountants has to improve the organizational performance and profitability with the help of new skills development [40]. Tarigan and Kunto [69] have stated that this accountant can also be a player if he or she is involved at the strategic level planning or providing information to top-level managers who are involved in the strategic planning and decision making.

5. Previous Studies on BDA Capabilities

Many research studies have revealed areas in which use of big data projects can be leveraged [8, 47,70]. Such studies have also specified areas where overall firm performance gains can be achieved [66]. The main assumption is that although BDA Capabilities include a number of generally similar aspects which are usually considered without reference to the context, this capability can be applied with considerable diversity. As an example, a number of studies have shown that companies relating to the media and news industry as well as telecommunication industry do apply their BDA Capabilities with the purpose of personalizing contents aimed at their customers and providing standardized news and products [54].

At the same time, the usage of a lot of heterogeneous BDA applications has been seen in different business sectors, which in turn can lead to outcomes with unique business gains and value [66] . Many recently carried out studies have shown the influence which BDA Capabilities have had on enabling different types of firm's capabilities [30,71,72].

Organizations can refer to the large number of data collected by firms and can use hidden information and patterns in data and can enhance business value [73]. There are numerous studies which have verified that there is a need to improve in communicating system in healthcare sector

for betterment of patients [74,75]. For quick and best decision making in healthcare data is vital and BDA is playing and important role in this regard [76]. Access on these information and big data is very crucial from anywhere and anytime to deliver best services for patients and hospitals [77, 78].

Table 1
Studies on IT Capability and BDA Capabilities

Studies on IT capability using RBT	Study type	Types of IT capabilities & Big Data Analytics	Relationship between IT capability & BDAC and business performance	Respondent
Mikalef, Boura [3]	Conceptual & Empirical	Firm performance & Big Data Analytics	Direct	IT Managers & Chief Information Officers
Adrian, Abdullah [70]	Conceptual	Development of big data analytics implementation assessment effect on decision making.	-	
Wang and Hajli [81]	Empirical	Big Data analytics path exploration	Direct	Healthcare Practitioners
Wamba, Gunasekaran [22]	Empirical	Big data analytics and firm performance mediating role of dynamic capabilities.	Direct	IT Manager & Business Analyst
Janssen and Wahyudi [82]	Literature Review	Important factors influenced on decision-making aspects related to big data	-	
Chen, Preston [83]	Empirical		Direct and Indirect	Business Managers
Lioukas, Reuer [84]	Empirical	Management IT capability and alliance performance	Direct	IT Managers
Kościelniak and Puto [85]	Conceptual	Role of big data in decision making.	-	
Kim, Shin [86]	Empirical	Information technology management, infrastructure and personnel capabilities.	Direct relationship with the higher-order IT capability construct and firm performance.	IT Manager
Bhatt and Grover [87]	Empirical	Information technology-based infrastructure quality, business expertise and relationship infrastructure	Direct relationship	IT and Business Managers
Pavlou and El Sawy [88]	Empirical	IT leveraging competence, dynamic and functional process capabilities.	Indirect relationship	IT Managers
Tippins and Sohi [89]	Empirical	Competency of IT in organizational learning	Indirect relationship	IT Managers
Santhanam and Hartono [90]	Empirical	Information technology capability and firm performance	Direct relationship	IT and Business Managers
Bharadwaj [91]	Empirical	Information technology capability and firm performance	Direct relationship	Managers

Recent studies show that there is an improvement in firm performance due to the investments in BDA Capabilities [22,66,79]. However, alone BDA is not sufficient to enhance better performance

directly, there could be some other intermediate variables which may impact of big data on firm performance by mediation [3, 80]. Table 1 summarized previous studies conducted on IT and BDA Capabilities.

As per above Table 1 there is a significant conclusion that there were mix results from previous studies. Direct and indirect relations are existing in previous studies of IT & BDA Capabilities. Furthermore, respondents are mostly IT managers and studies has done on individual basis rather than organization basis. Due to lack of empirical research on BDA Capabilities there is significant gap existed in knowledge base as well as generalizability which is proposing in current study. In current studies BDA Capabilities are under research at organizational level represented by top management CEOs OR CFOs respondent in innovation industry.

6. Theoretical and Conceptual Framework, Empirical Evidences and Hypotheses Development
6.1 Big Data Analytics Capabilities and Organizational Innovation Performance

Currently there are a few studies on big data [42]. However there are some studies which have focused on the different challenges faced by different companies during the stages of implementation of different projects related to big data [52,57]. In particular, within the sphere of Information Systems, researchers are recognizing the fact that success of the big data related projects depends on the data as well as the analytical tools and processes and other aspects which cover a broad range of items [64]. to deal with such events, the concept of BDA Capabilities has been suggested. It can be defined, in broad terms, as the organization's capacity to provide insights into the usage of data management, infrastructure, as well as human capabilities in order for the business to become competitive force [65,66]. The research that has been carried out so far in this domain has focused on such BDA Capabilities which are strategy-driven, and at the same time, on the mechanisms through which competitive advantages and the related benefits can be obtained [92]. Many scholars are of the opinion, BDA Capabilities should be focusing on the processes which need to be put in place so that the advantages of using big data can be achieved [93,94]. A number of other researchers are focusing on carrying on investments in the needed resources as well as the alignment of such resources with the organizational strategy [71]. The crux of the matter is that the concept of BDA Capabilities focuses on inclusion of all related organizational resources which are essential in utilizing big data to their full strategic potential.

As a result of the upward trend of velocity, volume and variety of data, newer approaches for analysis and forecasting, using big data analytics capabilities are needed. Organizations are using big data analytics capabilities for creating innovation in their services, procedure and products to increase organizational innovation performance [6]. Very few studies have been conducted to assess the impact of big data analytics capabilities on the organization innovation and performance [3,22].Considering the theoretical, conceptual and empirical relationship between big data analytics capabilities and organization performance and innovation in above section, current study proposed as follow

H1: Big Data analytics capabilities influence organization's innovation performance.
6.2 Management Accountant, Organizational Innovation Performance

According to Lawson [34] management accountants are involved with the people having the greatest level of responsibility for the performance of the organization and who are involved in making important decisions based on the related costs and revenues/incomes reports, organizational budgets, and other related reports prepared by the accounting and finance teams in their relevant

departments. Management accountants are also involved in providing guidance to the organization's senior managers for the better management of the assets, expenses, and risks. According to Lawson [36] as an example, the upper management may likely need to know whether the company should be involved in the expansion of its operations abroad or should it be involved in the development of a new product line.

Due to strategic involvement of management accountants in decision making to attain competitive advantage for business performance [35,37,38] a need to understand new skill set is required from them. It is understood that in current big data environment where modern technologies are transforming business processes and therefore to obtain business value, management accountants roles are also needed to investigate in relation with BDAC and OIP [55,56]. However, the extent of the role of management accountant in the relationship between BDAC & OIP has not explored in literature. Thus, this research attempts to investigate the moderating impact of management on the linkage between BDAC & OIP while proposing

H2: Role of Management Accountant moderates the relationship of BDAC and OIP
6.3 Conceptual Framework of the Study

Figure 1 shows the conceptual model for this study. This model is built on the basis of theoretical and empirical evidences about the direct relationships between BDAC &OIP. And also, first time in literature current study proposed moderating effect on direct relationship of BDAC and OIP with the Role of Management Accountant.
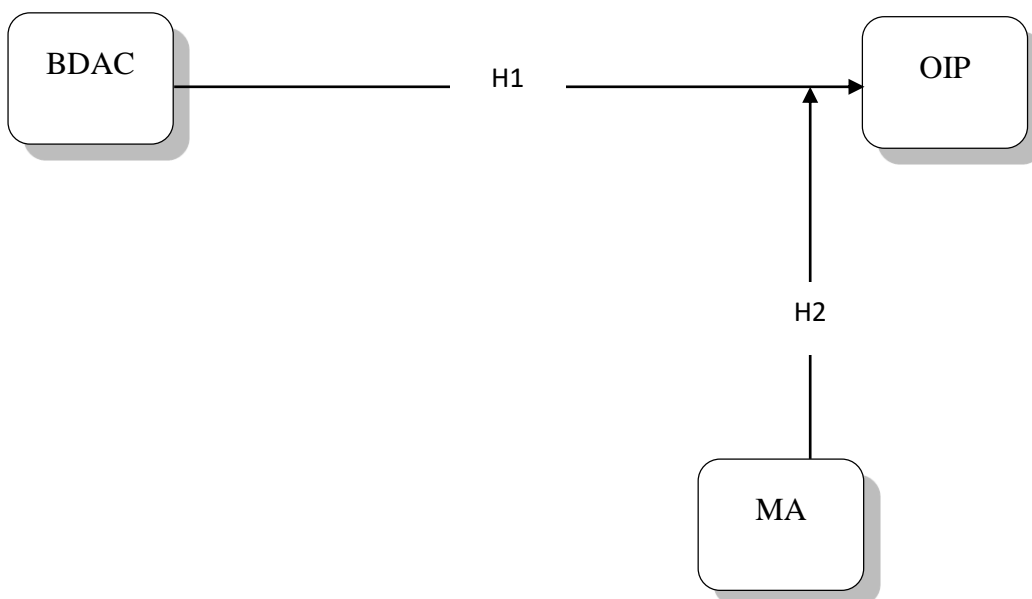

Fig.1. Research Model

7. Methodology

The study will use data from surveys of CFOs, CEOs, or CIOs of the pharmaceutical companies of Pakistan. Current study will employ a survey questionnaire methodology due to positivist approach

adopted, which is a frequent methodology in management research and is generally linked to the deductive method [95].

8. Conclusion

This study will add to the growing body of literature that relies on IT capability-competitive advantage-firm innovation performance. This paper represents the first empirical study examine the current extent of big data analytics capability in pharmaceutical companies in developing countries like Pakistan.

This is the first paper that investigate the relationship of big data analytics capability, innovation performance and impact of the role of management accountant in pharmaceutical companies in developing countries like Pakistan. The study provides insightful guidance in practical strategic decision making for industrial managers, the government, educational institutes, researchers and investors in Pakistan to understand better the current performance of big data analytics in Pakistan. The authors believe this framework to be a unique and valuable contribution to society, economy and nation since. This study will investigate the impact which BDA Capabilities have on the organizational innovative performance through the development of process oriented dynamic capabilities in pharmaceutical companies in developing countries like Pakistan. It will also include the impact of the role of management accountant. In developing countries like Pakistan, big data analytics (BDA) has offers so many opportunities to the businesses and thus it is a key driver in the nation's ambition to become a fully developed knowledge economy. This study allows the government to measure progress toward achieving their target to become a fully developed knowledge economy.

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