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Examining the Effect of Business Analytics Investment on Competitive Advantage through Dynamic Capabilities in organisation

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Abstract: In order to retain profitability and guarantee long-term sustainability, organizations must get adequate commercial value from the use of business analytics. In the rapidly evolving telecommunications industry, businesses based in Bangladesh are having to deal with the issue of improving their performance in order to remain competitive. Nevertheless, when it comes to the effect that business analytics has on the performance of an organization in this particular context, there is a dearth of research that has been conducted. Recently, business intelligence and analytics have emerged as a strategic approach that may be used in management tasks, providing opportunities to improve the effectiveness of operations. Despite the fact that there is a growing interest in the evaluation of examples of analytics adoption, to the best of our understanding, few studies have been conducted to investigate the effects of a data-driven culture and the repercussions of the adoption of business analytics, particularly with regard to how it impacts the performance of managers in their jobs. Every company is affected by the changes that occur in a dynamic corporate environment throughout time. Two essential variables that have a significant impact on the success of a firm are the implementation of technological improvements and the diversity of products. As a result, pre-selected superior strategies are often inadequate, which makes it necessary to identify and develop new strategies in order to increase the competitiveness of the organization. This demonstrates the importance of the abilities and resources that firms must develop in order to achieve a competitive edge from a resource-based strategy approach.

Keywords: Business Analytics, Process Agility, Competitive Advantage, SEM

I. INTRODUCTION

Business analytics is well-documented as a method that improves the progress of a company by making decision-making processes more effective. As a result, company performance and business value are increased. Due to the fact that the contemporary corporate environment is ever-changing and very competitive, it is essential for businesses to make judicious decisions in order to ensure that they will continue to be profitable and sustainable in the long run. As a consequence, business intelligence and strategic information have become indispensable for every firm that aspires to remain profitable, relevant, and sustainable, leading to a greater focus being placed on the analysis of business data. By making it easier to analyze and examine large amounts of data from organizations, business analytics may reveal insights that are strategic in nature [1]. This entails doing an analysis of the relationships between variables and identifying patterns that might potentially improve the decision-making process of an organization, hence resulting in a substantial improvement in the strategic decisions that are made [2].

The strategic environmental and economic advantages that are linked with the digital economy have been recognized and acknowledged by modern-day organizations [3]. Within the context of the present and transforming environment that is propelled by technology innovation, business analytics is a fundamental element. During the period of economic digital transformation, newly formed firms are actively involved in the process of transferring their businesses into the digital arena, where they use extensive amounts of data in order to make decisions [4]. In order to develop, retain, and communicate useful insights that are essential for predicting potential opportunities and hazards, while also taking into account variances in the business environment, technical assistance and supervision are required when working with large amounts of data. Businesses may use business analytics for a variety of purposes, including but not limited to the following: responding to the goods and tactics of rivals, forecasting trends in the market, assessing huge data sets, analyzing the behaviors and demands of customers, making decisions based on evidence, and optimizing time efficiency. The advantages that are gained by using business analytics skills might potentially result in improvements to the procedures used in knowledge management. In actuality, business analytics provides senior management with the ability to make decisions that are based on data and facts rather than emotions [5].

Business analytics via the process of analyzing data that is obtained from a variety of sources, such as social media, e-commerce platforms, and websites that provide useful information. However, in the field of financial services, there is

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a scarcity of research that examines the implications of business analytics (BA). The body of research that examines the effect that business analytics (BA) has on the performance of companies operating within the banking sector is not yet adequately developed [6]. At the same time, these organizations are going to have to deal with problems that are starting to show themselves in addition to potentially significant disasters that may reemerge. The banking sector in Malaysia is under pressure to continuously adapt and embrace digital transformation in order to maintain a competitive edge in situations when the market is unstable. While many companies continue to struggle with the difficulty of providing valuable insights, the field of business analytics is growing in prominence. Consequently, it is necessary to do more study investigations on the factors that influence the adoption of analytics inside companies or the factors that determine business analytics [7].

II. LITERATURE REVIEW

The culture of an organization could change over time as its fundamental tenets are learned rather than being innate. The notion of cultivating an analytical culture as a replacement for a culture that is motivated by emotion when it comes to assessing different approaches to reaching decisions Over the course of time, as the era of big data progressed, the idea of depending on data went through a transformation that culminated in the emergence of a culture that is driven by data [8]. The definition of DDC that is most frequently cited in the literature is one that was originally proposed in 2013. It characterizes DDC as "a pattern of behavior and practices among a group of individuals who collectively believe that possessing, comprehending, and utilizing specific types of data and information is essential for organizational success." The data-driven culture was still in its infancy inside businesses at the time. The use of data has been crucial in the development of this kind of organizational culture from its inception [9].

The emergence of business analytics (BA) as a component of business intelligence (BI) has been emphasized by academics, who have pointed to the fact that BA depends on explanatory and predictive models in order to provide information that can be used to make decisions and take action [10]. Since that time, there has been a lack of agreement over the definition of BA, and there have been a number of perspectives that differ from one another. At this time, business intelligence is offering solutions that are powered by information technology in order to make corporate analytics easier. Business Intelligence (BI) is the foundation for the development of Business Analytics (BA), which places a strong emphasis on the presentation of organized data and business reporting. The term "business intelligence and analytics" has been put forth by researchers as a more thorough and complete appellation. "The techniques, technologies, systems, practices, methodologies, and applications that analyze essential business data to assist an enterprise in comprehending its operations and market, thereby facilitating timely business decisions" is how it is described [11]. In a similar fashion to a number of previous studies, we have made use of this word in our research, recognizing that, despite the fact that business analytics has achieved a greater degree of popularity, it has not taken the place of business intelligence. We are able to confirm that the functions of Business Intelligence that are centered around reporting have been merged with the capabilities of Business Analytics that are focused on analysis. Business Analytics (BA) and Business Intelligence (BI) have both shown to be valuable to businesses by improving their performance on the job and giving them an advantage over their competitors. Despite this, BA is unquestionably the area that is growing the most quickly within the fields of BI and analytics [12].

The tasks, obligations, and actions that are carried out by individuals who have management positions inside of a business organization are collectively referred to as managerial job. This encompasses tasks such as planning, organizing, coordinating, decision-making, and managing resources in order to achieve the goals of the organization [30]. There are a number of factors that have an effect on how well a manager performs in their position, including those that are of a human nature, those that are organizational in nature, and those that are external in nature. Organizational elements, such as the use of business information and analytics technology as well as access to relevant resources, in addition to human attributes such as talents, experience, and skills, have a significant impact on the performance of employees in managerial positions [13]. Managers have the potential to fully use the possibilities of business analytics solutions and improve their performance when they are equipped with both the necessary expertise and the advanced technological tools [14].

Businesses analytics is becoming more popular among companies as a way to get strategic insights and enhance their decision-making abilities in today's highly competitive business environment. Despite the significant financial and technological resources that have been devoted to analytics endeavors, a significant number of companies discover that it is difficult to transform these expenditures into tangible competitive advantages [15]. Because of the quick pace at which technological innovation is advancing, in addition to the growing number of data sets and their rising complexity, there are considerable hurdles in the way of making effective use of analytics to gain a competitive edge. Maintaining the integrity of data, implementing analytics into their existing decision-making frameworks, and nurturing the essential analytical capabilities among personnel are three issues that organizations often encounter. In addition, although business analytics have the potential to increase creativity, improve process agility, and encourage organizational

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learning, there is a lack of empirical evidence that demonstrates how these components may be integrated in order to achieve a lasting competitive advantage [16].

In addition, the concept of dynamic capabilities, which refers to the ability of a company to make adjustments, integrate, and reorganize resources in response to changes in the market environment, has not been the subject of much investigation in the context of analytics investment. A significant number of businesses fail to see the reality that just making investments in analytics tools is not enough. The genuine worth of these investments comes to light when they are incorporated with organizational capabilities that enable the successful detection, acquisition, and transformation of opportunities [17]. The necessity for research that explores the association between business analytics investments and competitive advantage from the standpoint of dynamic capabilities is highlighted by this gap. It is crucial for both scholars and practitioners to understand this relationship because it provides insights into how companies may strategically employ analytics to achieve outstanding performance, maintain relevant in markets that are changing, and give lasting value over time.

III. METHODOLOGY

The primary objective of the research methodology is to conduct a systematic examination of the relationship that exists between investments in business analytics and competitive advantage. In addition, it takes into consideration the mediating impact of dynamic capabilities. An strategy known as descriptive research is used in this study. This method is well-suited to the tasks of evaluating the current status of variables, identifying trends, and examining the interactions between constructs that occur in organizational settings. By using the descriptive approach, the researcher is able to get a comprehensive understanding of the ways in which organizations invest in analytics, how these investments are operationalized via dynamic capabilities, and the subsequent impacts that these investments have on competitive advantage.

In order to ensure that the analysis is thorough, the study makes use of both primary and secondary sources for the collection of data. Surveys that have been standardized are conducted to both employees and management at companies that are actively involved in business analytics in order to collect primary data. The primary objective of the questionnaire is to collect information on levels of investment, the rate at which technology is being adopted, competency in analysis, the extent to which analytics are incorporated into the decision-making process, capacity for innovation, flexibility of processes, and learning that takes place inside the company. Secondary data is obtained from academic papers, industry reports, organizational records, and case studies in order to provide support for the conceptual framework and to contextualize the findings.

The non-probability strategy known as convenience sampling was used in the study to choose respondents for primary data collection. This facilitated the rapid capture of data from individuals who were readily accessible. This approach ensures that the research incorporates perspectives from relevant organizational stakeholders, while also sticking to the true constraints that are imposed by time and resources. The methodology uses a descriptive research design, incorporates numerous data sources, and employs convenience sampling to methodically investigate the influence that business analytics investments have on competitive advantage through dynamic capabilities. As a result, it produces meaningful findings for both academic research and real-world application

IV. ANALYSIS

Table 1: Correlation Analysis

Correlations	Process Agility	Technology Adoption	Analytical Skills of Employees	Integration of Analytics in Decision-Making	Competitive Advantage
Process Agility	1	.859**	.917**	.894**	.922**
Technology Adoption	.859**	1	.875**	.877**	.897**
Analytical Skills of Employees	.917**	.875**	1	.930**	.972**
Integration of Analytics in Decision-Making	.894**	.877**	.930**	1	.956**
Competitive Advantage	.922**	.897**	.972**	.956**	1

The correlation study offers a thorough assessment of the correlations between the key variables: process agility, technology adoption, employee analytical skills, the use of analytics in decision-making, and competitive advantage. The results show a strong and statistically significant positive link between all of the variables, which shows how these organizational traits are connected. Process agility, which shows how well an organization can quickly and effectively adapt to changing business conditions, has strong positive correlations with technology adoption (.859**), employee

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analytical skills (.917**), the use of analytics in decision-making (.894**), and competitive advantage (.922**). The results show that companies that are more flexible and adaptable in their processes are more likely to invest in new technologies, help their employees become better at analyzing data, use analytics in their decision-making, and ultimately do better than their competitors.

The adoption of technology, which shows how much companies employ advanced analytics tools and technologies, is strongly linked to workers' analytical skills (.875**), the usage of analytics in decision-making (.877**), and competitive advantage (.897**). This shows that technology alone isn't enough; the benefits of spending money on technology are greater when people have the right analytical skills and when analytical insights are always used to make strategic and operational decisions. The analytical skills of employees are a key factor in organizational learning and knowledge application. They have the strongest connections overall, with the use of analytics in decision-making (.930**) and competitive advantage (.972**) showing extremely strong associations. This shows how important human capital is for turning money spent on analytics into real outcomes for the firm.

Using analytics in decision-making, which looks at how data-driven insights affect organizational strategies, is very closely linked to competitive advantage (.956**). This means that using analytics in decision-making is very important for keeping high performance. The very high correlation coefficients between all the variables show that they don't work on their own; instead, they work together as a system. For example, improvements in analytical skills or technology adoption can have a positive effect on other areas, such as process agility and analytics integration. The correlation analysis highlights the critical interaction of technology investments, interpersonal skills, operational agility, and strategic analytics use in cultivating competitive advantage, hence providing empirical support for the study's conceptual framework.

Table 2: Regression Analysis

Model	Sum of Squares	df	Mean Square	F	p value
Regression	252.882	4	63.221	979.589	.000b
Residual	8.261	128	0.065		
Total	261.143	132			
Coefficientsa	B	Std. Error	Beta	t	p value
(Constant)	-0.079	0.066		-1.2	0.23
Process Agility	0.08	0.044	0.076	1.812	0.07
Technology Adoption	0.098	0.036	0.096	2.69	0.01
Analytical Skills of Employees	0.516	0.05	0.524	10.285	0.00
Integration of Analytics in Decision-Making	0.339	0.05	0.317	6.78	0.00
a Dependent Variable: Competitive Advantage					

The regression analysis provides a thorough assessment of how the selected independent variables—process agility, technology adoption, human analytical capabilities, and the use of analytics in decision-making—forecast competitive advantage both collectively and individually. The model is statistically significant, with an F-value of 979.589 and a p-value of .000. This means that the independent variables do a good job of explaining how competitive advantage varies across the organizations that were looked at. The total sum of squares (261.143) and the regression sum of squares (252.882) show that the model explains a large part of the variance in competitive advantage. This shows how important these organizational aspects are for getting improved performance outcomes.

Examining the individual coefficients clarifies the comparative influence of each predictor. The positive coefficient of 0.08 for process agility means that making organizational processes more agile usually gives them a competitive edge. However, the correlation is not very strong at the 0.07 level. This means that process flexibility and responsiveness might improve performance, but other factors in the company may lessen their effect. The adoption of technology shows a positive and significant coefficient of 0.098 ($p = 0.01$). This means that companies that invest in advanced analytics tools and technologies are more likely to gain a competitive edge. This shows how important technological resources are for making decisions based on data and improving operational efficiency.

The results show that workers' analytical skills are the strongest predictor in the model, with a coefficient of 0.516 and a very significant p-value of .00. This shows that the ability of human capital to analyze, evaluate, and use data is very important for turning analytics spending into measurable competitive advantages. The use of analytics in decision-making has a positive coefficient of 0.339 and a significant p-value of .00, which shows how important it is to use data-driven

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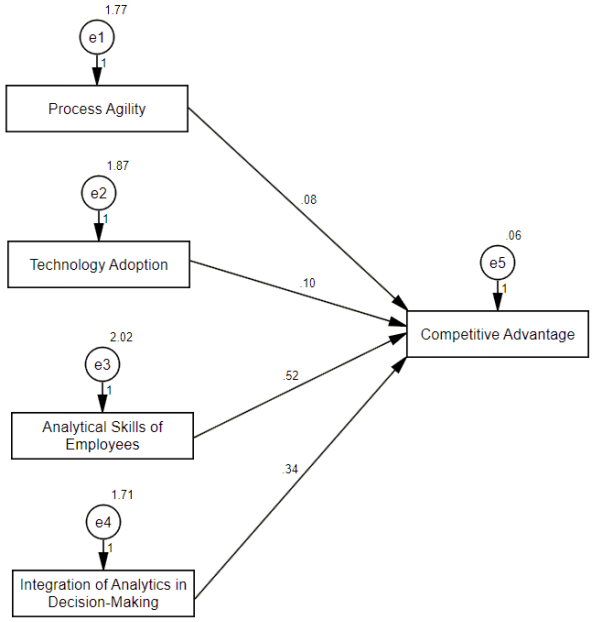
insights in organizational plans and processes. The findings suggest that while technological and procedural agility are crucial, it is the combination of skilled personnel and the effective integration of analytics into decision-making that most substantially improves competitive advantage. The results substantiate the study's conceptual framework, illustrating how dynamic capabilities facilitate the relationship between investments in business analytics and organizational performance outcomes.

Structural Equation Model



The structural equation model shown in the image clearly delineates the links between the independent variables—process agility, technology adoption, staff analytical abilities, and analytics integration in decision-making—and the dependent variable, competitive advantage. Each route in the model is connected to a standardized coefficient, which shows how strong and in what direction the interactions between constructs are. The model clearly shows that all four independent variables have a beneficial effect on competitive advantage, albeit to different degrees. With a coefficient of 0.52, workers' analytical skills had the most effect. This shows that their ability to analyze, assess, and apply data is the most important aspect in turning corporate analytics spending into real competitive advantages. Analytics have a big role in decision-making, as evidenced by a path coefficient of 0.34. This means that using analytical insights in strategic and operational decisions is important for increasing the performance of a business.

Process agility and technology adoption, although significantly connected with competitive advantage, have lower path coefficients of 0.08 and 0.10, respectively. This indicates that although organizational flexibility and technology deployment are important, their direct effect on competitive advantage is not as strong as that of human capital and decision-making processes. The error terms associated with each variable (e1 to e5) signify the variance that the model does not account for, suggesting that while the four predictors collectively elucidate a significant portion of the variance in competitive advantage, other contextual or organizational factors may also exert influence. The method shows how organizational strengths, technology, and analytical abilities all work together to provide a company a competitive edge. This provides empirical validity for the study's conceptual framework, illustrating that investments in analytics need skilled staff and effective integration into decision-making to provide substantial strategic gains

V. DISCUSSION

The analysis of the correlation data provides significant insights into the interaction of various organizational abilities and their influence on competitive advantage [18]. The extremely strong positive links between process agility and things like technology adoption, employee analytical skills, using analytics in decision-making, and competitive advantage show that the company is very well integrated [19]. This means that process agility is both an operational trait and a strategic driver that affects and improves other talents in the business. Companies that can quickly adjust to changes in the market are more likely to use new technologies, teach their employees how to think critically, and make decisions based on data. This alignment makes sure that strategic decisions are based on facts, are made quickly, and are flexible, which greatly increases the organization's ability to stay ahead of the competition [20]. The strong link between process agility and

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competitive advantage shows that being flexible and responsive in operations quickly improves market performance. This means that agility turns operational excellence into strategic success [21]. Also, the link between analytical skills and utilizing analytics to make decisions shows how important it is to have people who can utilize technological tools effectively. It says that educating employees to analyze and understand data is important for getting the most out of technological tools and analytics platforms, which will improve decision-making and the performance of the business [22].

VI. CONCLUSION

In conclusion, the study shows that companies that want to have a long-term competitive edge should not think of process agility, technology adoption, and staff analytical skills as distinct things. These parts need to be worked on in a manner that is coordinated and integrated, since their connection makes the organization much more successful. Process agility is the foundation that lets businesses leverage technology and people skills to make important, data-driven decisions that put them at the top of the market. This means that professionals should focus on improving process flexibility, buying new technology, and teaching staff how to think critically all at the same time, as part of a larger plan. By fostering this kind of environment, companies may create a never-ending cycle of improvement, new ideas, and competitive advantage that lets them adapt to the changing and increasingly complex requirements of today's business world. This comprehensive vision stresses that the real power of organizational abilities comes from how they work together, making the whole far stronger than the sum of its parts.

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