

Artificial Intelligence and Business Intelligence: Enhancing Agility and Innovation in Digital Media Ecosystems

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Abstract

Business intelligence shows a significant relationship with competitive advantage in the market within competitive digital media ecosystems. This paper explores how Artificial Intelligence and Business Intelligence influence competitive advantage, specifically within digital media ecosystems. The study was conducted in the UAE and cross-sectional data was collected from IT companies and businesses operating in UAE. The study is based on a sample of 204 questionnaires completed by managers and owners of IT companies in Dubai. Structural equation modeling analysis was performed. The findings indicate that there is a positive correlation between business intelligence, business agility and maintaining a competitive edge in the global digital market. The results supported the main hypothesis and showed a positive and significant relationship between business intelligence and competitive advantage particularly in the digital media industry. Business process agility significantly mediated the relationship between business intelligence and competitive advantage. Since there is limited research surrounding the practical application of BI and business agility concepts to gain a competitive edge This research provides valuable insights into the practical application of BI and business agility, offering a framework for further study and implementation in digital media ecosystems.

Keywords: Business intelligence, Big data, Competitive edge, Business agility, digital media ecosystems.

The information technology field has seen the kind of growth and development like no other field has. Every industry in the world is keen to adopt to new and latest technologies to stay in touch with modern world's demands. Those who

are slow or resistant in adopting new trends through technologies, stay far behind from competition [1]. The world knows United Arab Emirates as a country of opportunities, be it businesses or employment. Dubai is the hub of

all kinds of businesses. Dubai is known for promoting businesses and introducing new and latest upgrades in every aspect. So, is the case of technology. There is no technology known to the world that is not being used in UAE, especially in Dubai. The 'meta-verse' and the multi dimension have taken their first steps in Dubai, by hosting the first meta-verse wedding in the world. Digitization has made companies smarter and making them reach new dynamics within their businesses. The digitization has encouraged businesses to reach to the specific and desired audience for them to be converted in their long-term customers [2]. The adaptation of new technologies is the only survival tactic for companies/businesses of all fields [3].

This study has chosen Dubai IT companies as its target audience to analyze the research model, whether business intelligence and competitive advantage has any relationship with business intelligence and competitive advantage and what role does business process agility plays in this model. This study chose Dubai IT companies to make it a threshold point for future research to explore further industries but since IT field is closest to digitization, hence the reason for study. Every single day there is a new company or business emerging in the market. This is because of the digitization era, that we are living in. companies are becoming smarter, and businesses are growing and reaching new dynamics every day because of digital era. The digitization has encouraged businesses to reach to the specific and desired audience for them to be converted in their long-term customers. The adaptation of new technologies is the only survival tactic for companies/businesses of all fields. To keep the data and record up to date and stored safely, business intelligence is the key and answer to successful business [4].

Theoretical Background

This study has used three main terminologies for its research. i). Business Intelligence, ii). Competitive Advantage, iii). Business Process

Agility. All three variables are interpreted based on the model presented in the study. We assume that business intelligence has a significant relationship with competitive advantage in the market for a specific product or a company. That means, if a company has business intelligence setup, it is more likely that the same company has a competitive advantage in the market on other companies. Below we try to explain each terminology.

2.1. Business Intelligence

Business intelligence (BI) uses technologies and services to turn information into actionable insights that inform the strategic and tactical business decisions of an enterprise. In reports, summaries, dashboards, graphs, charts and maps, BI tools access and evaluate data sets and present analytical results to provide users with accurate intelligence about the state of the organization [5]. The goal of BI initiatives is to drive better business decisions that enable organizations to boost sales, enhance operational performance, and gain competitive advantages over their business competitors [6]. BI integrates a mix of analytics, data processing and reporting tools, as well as different data management and research methodologies to achieve this goal. The purpose of this study is to analyze whether a relationship exists between Business Intelligence and Competitive Advantage and if it does whether it is mediated by Business Process Agility [7]. It is hypothesized that there is a positive significant relationship exists [8]. This study will help academics see the model with another perspective and will help businesses in IT field, learn the benefits of business intelligence. This way businesses can set up a budget of their revenues specifically set aside for the sole purpose of business process agility through business intelligence. A competitive market rarely give chance to a business or company to survive if it lacks the modern day demands [4].

2.2. Business Process Agility

Business process agility is a way, regardless of the business model, for companies to stay agile through market fluctuations. While it is not

a crystal ball to see the future, it is as close as one can get. The use of systems and patterns to measure and predict the probability of what may happen is always a choice [9]. However, these calculations are far from perfect with the number of variables at play and the human factor in the mix. Markets are man-made, and man is not always logical, despite believing otherwise [10]. Business process agility is an operational strategy that allows organizations to respond quickly rapidly to market changes, both internal and external. Its origins come from the growth of software [8]. It has evolved and developed over time to extend to different areas of business operations. It is a rapidly expanding area and have gained a substantial market share in the past decade. Furthermore, this trend is expected to grow substantially. Business intelligence is only beneficial for companies if they have business process agility, which helps them in adopting to new demands of the market [4]. Not just for IT companies but all around the world, this has been a pattern with businesses of different products, to be agile with latest technology to survive in the market [11]. The markets are becoming more and more digital. The information technology companies have set the bar too high as every single day there is an advancement in the current technology. From shopping within a retail store and in-person to shopping through webs and now through apps and getting everything delivered to your doorstep is nothing short of a technological miracle [12]. Now if a company wants to stay within the market and keep their business up and running, they need to make sure that their business intelligence is exactly up to date for them to be agile with latest trends. The IT companies in Dubai, see boom every year and keeping up with the trends and demands is only possible with best techniques and updated software for their business intelligence [13].

2.3. Competitive Advantage

Competitive advantage refers to variables that enable a business to produce goods or services better or cheaper than its competitors. These factors cause the profitable entity, relative

to its business rivals, to produce more revenue or higher margins. Business intelligence and business process agility could be considered as the tools necessary to impact on the competitive advantage of an organization [14]. In this paper, we discussed the impact that business intelligence and business process agility have on competitive advantage, and how both business intelligence and business process agility lead to competitive advantage. A company or business that tries to keep itself updated with the market demands, gets the most competitive advantage. Customers are loyal to those businesses that perform as per the demands and needs of the customers. In this digital era that is only possible with advancement in technology and adopting it right away without any delay [15]. Shifting a business to another stream, like going from manual transmission to automatic, is always challenging but is worth the effort.

Literature Review

The proposed research model follows the relationship between business intelligence and competitive advantage in market for IT companies, especially those who are keen to adopt the latest trends of digital era. Organizations are moving towards the technological advancement to have a competitive edge over other organizations. The IT industry is at boom these days, for the sole purpose that it sells the product that is required by other organizations to have technological advancements. Now if any IT company resists in adopting new trends of digital era, that means a death for its business. This paper focuses on IT companies of Dubai-UAE, since Dubai has been known as the business hub of the world where investors come to invest and start business and customers come to shop. From literature the three components of the paper are explained as:

3.1 Business Intelligence

[5] explained the significance of having business intelligence to improve serviceability in the organization. As it has become apparent for

the organizations to retain their market shares, the only feasible solution is to have a solid competitive edge [12]. Data analysis and interpretation needs time. This is because of the enormous amount of data. As digitalization has taken the world by storm, companies are now relying heavily on data sets. In the process of business intelligence, companies must understand these to make appropriate decisions. As times are changing, companies are shifting their focus on digital presence and, as a result, many companies exist digitally [16].

The data sets in the banking industry have become vitally important as bankers need to understand the data and make correct and meaningful decisions. Business intelligence has allowed companies to implement the data analysis techniques so that very large data sets can be easily understood [7]. There are different types of software which help companies understand the data sets and patterns. Data covers all the business' operations, and it should be converted into a meaningful form. Without the conversion to a meaningful form, large data sets do not have any significance. The conversion of data sets has enabled many organizations to make powerful and appropriate decisions [17].

Therefore, business intelligence has a direct relation with the competitive advantage. If the organization or business is efficient enough in its business intelligence processes, it will have attained a competitive edge within the organization [18]. This will help it grow and be more productive. However, if the firm has no competitive edge, it will not be able to grow. Other companies in the market will then overtake the organization and it can and will be eliminated from the market. For this reason, data sets have become important for the organizations in today's world as digitalization has become the need of the current time [19]. But business intelligence is only beneficial if human intelligence is not resistant to accept it. Those companies that are open to new trends and technology have a better chance of surviving in

a competitive market where there are multiple other companies that are offering same or better services/products but with the point in mind what people want exactly [19]. Business intelligence makes it easier to do business. The big data set are when handled by a human, have a chance of error but system/technology that is called business intelligence, help humans in developing a method of business with almost to no error.

Dubai is called a business hub of the world and businessmen around the globe come here to invest. There are thousands of businesses in Dubai that are offering IT services to multiple other businesses. These IT companies develop applications and social media management services for their clients. A single company needs to hire an IT professional to manage their data and media etc so one can wonder how an IT company can manage its own data. That is where business intelligence comes handy and only those companies that are eager to adopt business intelligence ways, have a chance of survival.

H01: Business Intelligence has no significant impact on achieving competitive advantage at Dubai IT Companies at ($\square\square 0.05$) level.

3.2 Business Intelligence and Business Process Agility

[19] evaluated business process agility helps organizations to attain a competitive advantage. As business markets are changing, companies are adopting new measures of businesses and technological advancements. It has become important for companies to adopt e new processes and to eliminate older processes [20]. This is known as business process agility because the organization must align itself to the changes in the internal and external environment [21].

Companies started to study the trends and patterns and, as such, they understood the customers' psyche and their preferences. They were then able to implement their new decisions and strategies. Many companies have adopted the business intelligence methods to keep them updated and to implement the business process agility [22]. As organizations must adapt

according to trends, it is important they understand the patterns. Customers' demands are constantly changing, and as a result, companies need to quickly respond to them so that customers can be retained, and the churn rate does not increase with time [23].

This is a very useful strategy for the companies around the world. It has enabled many organizations to penetrate the markets, because of understanding the market conditions and customers' demand. It is also the reason why they able to reach a conclusion and implement a new strategy [24]. Thus, the relation between business intelligence and business process agility is directly proportional. Business intelligence is a tool for businesses to achieve competitive advantage in market. The IT companies in Dubai are adopting the business intelligence software and applications to have the agility over their businesses. The business process agility comes with business intelligence and is part of the whole channel [22]. A business and especially an IT company needs to make sure that its business process agility is aligned with its business intelligence and business intelligence is serving the purpose of attaining competition and ultimate goal of having competitive advantage in market [25].

H02: Business Intelligence has no significant impact on Business Process Agility at Dubai IT Companies at ($\square\square0.05$) level.

3.3. Business Process Agility and Competitive Advantage

evaluated business process agility and the firm's competitive edge have a direct relation because when there is a business process agility, the firm gains a competitive advantage in the market and, as a result, it is easily able to perform better than its competitors. As times are changing, the customers' demands, and preferences are also changing [26]. Therefore, businesses need to change or adapt according to the situation. Let us look at Nokia as an example. The concept of business process agility was not yet in use when Apple and Samsung entered the market. Nokia could retain its competitive edge

in the market. However, it is also the reason why it lost its competitive edge to the technological giants Apple and Samsung [26].

Business process agility allowed the two companies to remain as leaders in this market and supersede Nokia. Nokia was, at one time, the market leader and its products were available for sale worldwide. This is the reason why this Finnish giant was able (and did) develop its brand image and reputation. Times changed and Nokia lost its reputation and image in the market. The sole reason was that Nokia did not accept and use business process agility [25]. It did not understand that people's demands and needs were changing, and they were asking for new products. Apple and Samsung understood the market and, as such, they gained a competitive edge in the market. Today, both these technological giants are ruling the global markets [27]. This has led us to believe that business process agility is the need of the current time. Therefore, businesses must adopt the changing market trends. If they are unable to accept or adopt the new trends, they remain far behind in the competition. It is likely that they will be eliminated too [28].

For this reason, many companies hire financial experts to study the technological advancements in the world and to suggest and provide suitable solutions. It has become the trend because organizations do not to lose their customers in the market. They need to retain them. To retain their customers, they must change their policies and strategies. Times are changing, and the competition in the business world is getting stronger [29]. As a result, many companies are closing. Change management is necessary. Research was carried out at the London School of Economics about the correlation between business process agility and competitive advantage. The authors reached the conclusion that both these variables have a direct relation with each other. If the organization understands the concept of business process agility, it retains its competitive edge When the organization changes its strategies and

operations according to the changing market trends, its market share is retained. For companies, one of the biggest turning points is the loss of revenue and ultimately profits [30]. Clearly, they do not want this to happen, and they would prefer to retain their market share and competitive edge.

H03: Business Process Agility has no significant impact on achieving competitive advantage at Dubai IT Companies at ($\alpha=0.05$) level.

3.4. Impact of Business Intelligence and Business process Agility on Competitive Advantage

explained that business intelligence, business process agility and competitive edge play a crucial role for businesses and organizations. As competition in the markets is high, companies need to mold their functions according to the trends and patterns set. This allows them to retain their competitive edge and the market share [31]. This literature review has provided sufficient opinions and explanations from already published journal articles around the world. The articles are detailed and have been examined and written by renowned journalists and research writers around the world. This literature review has explained the process of business intelligence in detail where, as the technological trends are changing with time, companies are shifting their focus and attention towards adoption of new strategies [32]. Further, it has been noted that a shift in technology is the sole reason that companies retain their market share. The example of Nokia is very important to mention here because Nokia did not accept or implement the shift in the technology and, as a result, lost the market share.

The main crux of this argument is that Nokia did not fully understand the concept of business intelligence because it did not read the trends and patterns. The data set of Nokia was huge but of little use as it was not converted to a meaningful form. As such, it was unable to understand the market conditions and the trends [18]. This resulted in Nokia being eliminated from the

market. All the big companies in the world have succeeded because they read and understood the changing market conditions and the environmental forces. They understood that it was important to understand the needs and requests of their customers and change their strategies accordingly. As the customers are one of the biggest assets of an organization or business, it is very important to understand their psyche [33]. The relation between the independent variable, the dependent variable and the mediator in this example is direct and positive because a shift in one factor leads to a shift in the same direction of the other factor and thus things are read in this way. Business process agility is very important for firms because it leads them to a competitive advantage. However, the process is not complete without business intelligence or BI.

The concept of big data has led the companies to believe that the data itself is useless if it is not studied or researched in detail [34]. There are many data analysis platforms and software introduced and companies are now making use of them. Well-known software is Python, and R, Tableau etc. These technological advancements in the data analysis world are changing the dynamics of the industries because it is allowing companies to understand the conceptual problems in detail. It is then easier for companies then to mold their strategies according to the changing market condition and the environmental forces in the market [35].

H04: Business Intelligence has no significant impact on achieving competitive advantage with the mediating role of Business Process Agility at Dubai IT Companies at ($\alpha=0.05$) level.

3.5. Research Gap and Problem Statement

It is noted that the evolution of BI is based on the principles of maturity, technology, and analytical technologies. The methodology implies that in gaining competitive advantage, both business intelligence and business process agility have a significant role. In this paper, the cause and effect are noted. Such as, where an organization or business does not heed the

advances in technology, remains stagnant and does not apply the concept of business process agility, it will not retain its competitive edge [36]. Business intelligence and agility of business process is developed through the systematic analysis of the literature, as well as studies exploring the relationship between the two and how they lead to competitive advantage. The analysis of the relationship between business intelligence and agility of business process is relatively new. It is, therefore, an area that needs further research and study [37]. In this paper, the focus is on Dubai information technologies companies that were working in making their business growth from plan to reality. It is noticed that the high-end business working in Dubai are keen in excelling in digital side and converting their businesses towards automation and inclined with today's world that is a digital era to say the least. Especially the IT companies that are working in Dubai, UAE have been seen to adopt to latest trends by digitizing their businesses with the best of what they can change in their business. To answer their question, whether it is worth adopting to new trends within the digital side, below is the much-needed research model.

3.6. Research Model

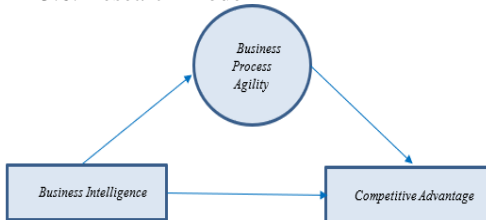


Figure 1: Proposed Research Model

3.7. Research Hypotheses

H01: Business Intelligence has no significant impact on achieving competitive advantage at Dubai IT Companies at ($\alpha \leq 0.05$) level.

H02: Business Intelligence has no significant impact on Business Process Agility at Dubai IT Companies at ($\alpha \leq 0.05$) level.

H03: Business Process Agility has no significant impact on achieving competitive

advantage at Dubai IT Companies at ($\alpha \leq 0.05$) level.

H04: Business Intelligence has no significant impact on achieving competitive advantage with the mediating role of Business Process Agility at Dubai IT Companies at ($\alpha \leq 0.05$) level.

Methodology and Research Design

For business intelligence and agility of business process and competitive advantage, non-empirical research has been conducted. This information was sourced through available online as well as physical archived material. The research design can be thought of the master plan of a research study, which specifies the methods and procedures for collecting and analysing the information needed to fulfil the research objectives and answer the research questions. It should address the following three issues at least: a sampling process, research methods, and the operationalization of variables [38]. A questionnaire was designed with five-point Likert scale and cross-sectional method was used to collect the data.

4.1. Population and Sample

A total 800 questionnaires were distributed among business owners who were in the field of information technology (IT) companies. 204 were filled out completely without any missing data and were able to be used for data analysis. Rest of the returned questionnaires, that were missing data, were discarded. The sample was carefully chosen based on the IT companies that are working in Dubai-UAE for at least five years. These IT companies were all business licensed and have their tentacles not just in UAE but all around the world. The business owners and employees of IT companies who were working on senior positions were contacted and asked for their consent for them to fill-out the questionnaire. All the participants were explained the purpose of the research and they were given the guarantee that all information shall be remained confidential. After contacting more than 100 companies through business

owners and senior employees, 800 questionnaires were distributed and after giving them a time of one week they were requested to return the form. More than 300 questionnaires were returned but only 204 were complete and useful. The rest of the incomplete questionnaires were discarded.

4.2. Analysis of Data

The chosen model for this research work has three variables namely Business Intelligence (BI), Business Process Agility (BPA) and Competitive Advantage (CA). The dependent variable is Competitive Advantage, independent variable is Business Intelligence, and the Business Process Agility is playing the role of mediation. The demographic variables include age and gender. Total 800 questionnaire was distributed, and the analysis was performed on 204.

4.3. Descriptive Analysis

The results of descriptive analysis are presented in table 1.

Table 1. Descriptive Statistics

	N	Mean	Std. Deviation
CA	204	3.8980	.83318
BI	204	3.7824	.87244
BPA	204	3.9195	.80176
Valid N (listwise)	204		

Note: BI= Business Intelligence, BPA= Business Process Agility, CA= Competitive Advantage

As there is no missing value in the data. The mean value for dependent variable CA is 3.8980 and the standard deviation is 0.83318. The highest mean value was of BPA i.e. 3.9195 with corresponding standard deviation of 0.80176.

4.4. Multi Collinearity and VIF

We are using VIF (Variance Inflation factor), Tolerance and the Correlation matrix techniques that widely used to verify the multi collinearity issues of the instrument. According to the threshold values for VIF is less than 5 and the threshold vales for tolerance is greater than 0.2. Values of VIF and tolerance within threshold conclude that there is no problem of multi

collinearity. As it shown from the table 2 of collinearity statistics that the value of VIF for Business Intelligence is 1.724, and for Business Process Agility is 1.724. All values are below threshold 5. So, there is no multi collinearity problem in the data.

Table 2. Collinearity Analysis

Sr. No.	Variables	Collinearity Statistics	
		VIF	Tolerance
1	Business Intelligence	1.724	0.580
2	Business Process Agility	1.724	0.580

The tolerance is opposite of VIF and should be greater than 0.2. All tolerance levels are above the threshold of 0.20 which is 0.580 for both Business Intelligence and for Business Process Agility. Hence the conclusion of the analysis that there is no multi collinearity problem in the data.

4.5. Correlations Analysis

Table 3. Correlations

		BI	CA	BPA
BI	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	204		
CA	Pearson Correlation	.672**	1	
	Sig. (2-tailed)	.000		
	N	204	204	
BPA	Pearson Correlation	.634**	.606**	1
	Sig. (2-tailed)	.000	.000	
	N	204	204	204

Note: BI= Business Intelligence, BPA= Business Process Agility, CA= Competitive Advantage

The correlation analysis is given in the Table 3. The results indicate that there is high positive correlation between BI and CA ($r=.672$, $p<.01$). There is also positive correlation between BI and BPA ($r=.634$, $p<.01$). CA and BPA are also positively correlated ($r=.606$, $p<.01$). It can be interpreted that Business Intelligence has positive impact on Competitive Advantage. Business Process Agility also positive associated with Competitive Advantage.

4.6. Structural Equation Modelling

suggest that the maximum likelihood estimators used in structural equation modelling (SEM) are relatively robust to violations of normality assumptions. Since this study was going to use SEM to analyse the study data through the Partial Least-Square (PLS) technique, normality concerns were more relaxed [25]. In any case, PLS does not depend on or assume data normality and it is suggested as a powerful SEM-based analysis technique.

4.6.1. Construct Reliability and Validity

Table 4. Reliability and Validity Analysis

	Cronbach's Alpha	Composite Reliability	Average Variance Extracted
Competitive Advantage	0.882	0.914	0.680
Business Process Agility	0.959	0.964	0.656
Business Intelligence	0.962	0.966	0.653

CFA is conducted to assess the measurement model and the results are shown in the table 4. From the table 4, the values of Cronbach alpha,

CR estimates and AVE are higher than the standard value which are 0.7 and 0.5, respectively. Cronbach's alpha was calculated for Business Intelligence after construct authentication was calculated and was 0.962, and composite reliability was 0.966, which designates a high correlation amongst the objects and the scale is consistent. There are different values related to the perfect value of alpha. For inferring the correlation and adjusted correlation coefficient, various methods are used. One of the techniques used to infer is the "Crude Measure". This technique is used to measure the extent of a correlation. When the values range from 0.00 to 0.20, it means that there is negligible relationship, 0.20 to 0.40 values indicate low relationship, whereas the values between 0.40 to 0.60 depicts moderate relationship, 0.60 to 0.80 shows substantial relationship, and 0.80 to 1.00 indicates high to very high relationship. So, in the case of Business Intelligence we could say that the correlation between the items of the construct is very high which is acceptable.

4.6.2. Factor Loadings

Table 5. Factor Analysis

Items	Loading Values	Items	Loading Values	Items	Loading Values	Items	Loading Values
BI1	0.803	BI10	0.840	BPA4	0.750	BPA13	0.730
BI2	0.785	BI11	0.786	BPA5	0.760	BPA14	0.847
BI3	0.826	BI12	0.794	BPA6	0.709	CA1	0.729
BI4	0.852	BI13	0.789	BPA7	0.761	CA2	0.842
BI5	0.852	BI14	0.822	BPA8	0.867	CA3	0.874
BI6	0.864	BI15	0.831	BPA9	0.909	CA4	0.855
BI7	0.769	BPA1	0.805	BPA10	0.894	CA5	0.816
BI8	0.773	BPA2	0.768	BPA11	0.749		
BI9	0.723	BPA3	0.853	BPA12	0.901		

Note: BI= Business Intelligence, BPA= Business Process Agility, CA= Competitive Advantage

As the benchmark of factor loadings is 0.7, it can be seen from the Table 5 that all the values of the items are higher than the standard range. Although one item was removed from the variable Business Intelligence and three items removed from the variable Business Process Agility due to the lower factor loadings.

4.6.3. Beta Values

Beta values of all the constructs were measured by using Smart PLS. The results are as showing bellow:

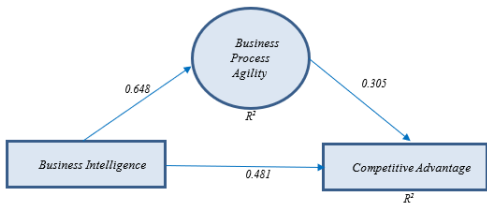


Fig 4.1 Model Beta Values

Note: BI= Business Intelligence, BPA= Business Process Agility, CA= Competitive Advantage

Beta value for the proposed relationship is 0.481 which shows that the relationship between Business Intelligence and Competitive Advantage is positive, and the impact of Business Intelligence on Competitive Advantage is 48.1%. Beta value for the proposed relationship is 0.648 which shows that the relationship between Business Intelligence and Business Process Agility is positive, and the impact of Business Intelligence on Business Process Agility is 59.6%. Beta value for the proposed relationship is 0.305 which shows that the relationship between Business Process Agility and Competitive Advantage is positive, and the impact of Business Process Agility on Competitive Advantage is 30.5%. As R^2 is the measure of model's explanatory power and according to the standard range the value of $R^2=0.515$, which depicts that the model has substantial explanatory power.

4.6.4. T-Values

The “T values” of all the variables are being reported in the figure below by Smart PLS.

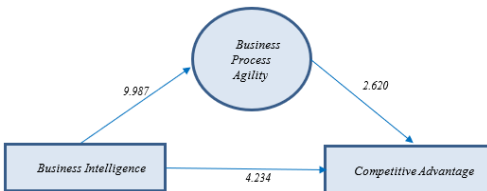


Fig 4.2 Model T Values

Note: BI= Business Intelligence, BPA= Business Process Agility, CA= Competitive Advantage

Further it can be noted from the above diagram that T values of all the variables are within standard range. According to [39], the acceptable values range from 1.96 and above. In this respect, the above analysis shows that relationships which have standard values are significant.

4.7 Model Bootstrapping

Since the sample size collected was almost 25% of the desired population, we had to choose the model bootstrapping technique, that allows to infer the results of smaller sample on overall population.

4.7.1 Path Coefficients

Table 6. Model Path Coefficients

	Coefficients	Standard Deviation	T Statistics	P Values
BPA->CA	0.305	0.104	2.941	0.003
BI->CA	0.481	0.108	4.440	0.000
BI->BPA	0.648	0.064	10.101	0.0000

Note: BI= Business Intelligence, BPA= Business Process Agility, CA= Competitive Advantage

Path coefficients can be seen in the table 6. According to the results we can say that all the paths have significant relationship. As the $T=4.440$, $p=0.000$ which is in the standard range and show that Business Intelligence have significant impact on the Competitive Advantage. From the above table 6 Business Intelligence has significant impact on Business Process Agility. Business Process Agility also has significant impact on the Competitive Advantage

Business Intelligence has no significant impact on achieving competitive advantage at Dubai IT Companies at ($\alpha=0.05$) level as the $p=0.000$. So, H_0 is rejected. Alternative H_1 is supportive.

Business Intelligence has no significant impact on Business Process Agility at Dubai IT Companies at ($\square\square0.05$) level, as the $p=0.000$. So, HO2 is rejected. Alternative H2 is supportive.

Business Process Agility has no significant impact on achieving competitive advantage at Dubai IT Companies at ($\square\square0.05$) level.as the $p=0.003$. So, HO3 is rejected. Alternative H3 is supportive.

4.7.2. Specific Indirect effects

Table 7. Model Indirect effects

	Indirect effect	T Statistics	P values
BI->BPA->CA	0.198	2.704	0.007

Note: BI= Business Intelligence, BPA= Business Process Agility, CA= Competitive Advantage

Specific Indirect effects results are shown in the table 7. As the $T=2.704$, and $p=0.007$, it could be described that mediation of the proposed relationship is significant. As Business Intelligence has impact on Business Process Agility between the team and Business Process Agility have a significantly influence on Competitive Advantage. So, HO4 is rejected. Alternative H4 is supportive.

4.8. Summary of Hypotheses Test

Table 8. Summary of Hypotheses Test

Hypothesis	Decision
H1: Business Intelligence impact on Achieving Competitive Advantage	Supported
H2: Business Intelligence impact on Business Process Agility	Supported
H3: Business Process Agility impact on Achieving Competitive Advantage	Supported
H4: Business Intelligence impact on Achieving Competitive Advantage with the mediating role of Business Process Agility	Supported

Discussion of the Results

It is noted that the evolution of BI is based on the principles of maturity, technology, and analytical technologies. The methodology

implies that in gaining competitive advantage, both business intelligence and business process agility have a significant role. In this paper, the cause and effect are noted. Such as, where an organization or business does not heed the advances in technology, remains stagnant and does not apply the concept of business process agility, it will not retain its competitive edge [40]. Business intelligence and agility of business process is developed through the systematic analysis of the literature, as well as studies exploring the relationship between the two and how they lead to competitive advantage [41]. The analysis of the relationship between business intelligence and agility of business process is relatively new. It is, therefore, an area that needs further research and study.

For all three variables, Business Intelligence, Competitive Advantage and Business Process Agility, the sample size was 204 out of a total population of 800. The descriptive variables were controlled since their values were insignificant to the study and its purpose. All four main hypothesis were accepted by the results, and it is proven that Business Process Agility has an effect over Competitive Advantage and acts as a mediating role between Business Intelligence and Business Process Agility [42].

The goal of business intelligence initiatives is to drive better business decisions that enable organizations to boost sales, enhance operational performance, and gain competitive advantages over business competitors. Big data plays a substantial role in in business intelligence initiatives. Big data is also referred to its prototype, data analytics, where the aim is to understand the data and use it to gain competitive advantage [43]. On the other hand, business intelligence uses analytics, data processing and reporting tools, as well as different data management and research methodologies to achieve this goal. The main objective of business intelligence is to assist organizations to analyze data to aid their decision making [44].

Business process agility is a method in which companies can stay productive through market fluctuations. Businesses and organizations require data of many different types to remain ahead of the competition. By engaging in and with business intelligence, and agility of business process, these businesses can gain a competitive edge, and retain it [45]. When the factors involved in these are understood and applied, businesses can maintain their standing in the markets, as shown in the above-mentioned research project. Those who adapt to current trends, shifting their strategies to embrace the changing patterns, can retain their competitive advantage [46]. Through the exploration of many opinions and explanations from already published journal articles around the world, as well as the thorough explanation through case studies (Nokia, Amazon, Uber) the benefits and necessity of BI is explored. As an example, Nokia achieved market leadership in mobile phones in 1988. However, as this company did not understand, nor make use of the available resources such as big data and did not convert the information into a usable form, it lost its competitive edge in the market.

It is noted that business process agility is very important for businesses as it assists businesses to reach a competitive advantage. It is also noted that if such data has not been correctly analyzed, the process is not complete [47]. With many data analysis platforms and software available, such as Python, R, and Tableau, businesses can adjust their strategies according to the changing market conditions, as well as the environmental forces in the market. Knowledge building is one of most important capability needed for a business or organization to gain competitive advantage [48]. The collection of data plays a large role in the development of knowledge in the business. Large businesses have recognized the value of this data and have used and changed said data into actionable processes to understand their markets, customers, or products better. Therefore, this has given them a competitive edge [31]. Business process agility is vital for

businesses and organizations as it will ultimately lead them to a competitive advantage. In today's world, with its constant changes, it is imperative that companies learn about, engage with, and use the available resources to ensure their position in the global market. By engaging with, understanding, and using business intelligence, and business process agility, businesses will have the ability to retain the competitive edge [49]. By doing so, they will be enabled to remain sustainable and increase revenue.

Conclusion

Business Intelligence (BI) is one of the business instruments on which the competitive benefits of different world-class businesses are founded. The capacity of a company to recognize changes, make decisions and make changes of same is also the difference between growing and disappearing in the highly competitive and evolving global environment. This characteristic is called Organizational Agility in an organization (OA). The evolution of business intelligence is based on the principles of maturity, technology, and analytical technologies [50]. In relation to organizational agility, the definition is checked as such with specific focus on the variables for the many concepts. The implication is that in gaining competitive advantage, business intelligence and business process agility has a significant role to play. There is a large amount of literature available on the role of business intelligence, business agility and competitive edge in the marketplace. However, the literature focuses more on large businesses.

This paper strives to understand the impact that business intelligence and business process agility has on competitive advantage. Information is garnered to correlate how both business intelligence and business process agility leads to competitive advantage. In conclusion, the importance of business intelligence and business process agility leading to competitive edge cannot be undermined. The discussion

attempted to correlate the information on the effectiveness of businesses and organizations making use of business intelligence, business process agility to increase their competitive edge. Both business intelligence and the theories of competitive advantage are relatively new in their fields. However, it appears that is essential for all businesses, and it is here to stay. Accordingly, there are opportunities for further research in business intelligence, business process agility and competitive advantage.

Recommendations and Future Work

Future research on the long-term effects of applying business intelligence, and agility of business process to specific businesses could extend the explanations on the importance thereof. Thus, it may be prudent to research the

availability of the different software applications to further the understanding of business process agility, data, and analysis of same. A larger sample size with multiple fields of business and companies can revolutionized the proposed research model. Future researchers who are interested in studying the same model can run the test on generalized companies rather than on one specific area of field like in this study, only IT companies were chosen. Researchers can also work with time-series data and check whether over the time the success of a company changed based on their adaptation rate towards new technology.

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