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Unlocking the potential of entrepreneurial ventures through big data analytics and cloud computing: An empirical investigation

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A B S T R A C T

The purpose of the current study is to examine the potentials provided by big data analytics and cloud computing in supporting entrepreneurial ventures. Quantitative approach was adopted through utilizing a questionnaire that was self-administered by (333) operational managers within entrepreneurial ventures operating in Saudi Arabia. SPSS was employed to screen and analyze gathered primary data. Results of study indicated acceptance of study hypotheses and confirmed that big data analytics and cloud computing are able to open many potentials for entrepreneurial ventures through big data analytics and its high potentials of informed decision making, and cloud computing along with its scalability and flexibility. The study suggested that entrepreneurs and their teams must have the necessary skills and knowledge. Investing in education and training programs can help entrepreneurs and their teams to stay up-to-date with the latest technologies and best practices in these areas. Further recommendations were presented in the study. Examining the potentials provided by big data analytics and cloud computing in supporting entrepreneurial ventures is significant because it can help entrepreneurs to make informed decisions, enhance the customer experience, increase efficiency, gain a competitive advantage, and drive innovation.

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1. Introduction

Hashem and Freihat (2020) stated that entrepreneurial ventures mean the establishment of a new business or startup by one or many people to offer new products and/or services to consumers. An entrepreneurial venture generally means establishing an opportunity or a market need and then formulating a business model or course of action besides sourcing for appropriate capital and resources to start and nurture the business (Block et al., 2021).

According to Fraccastoro et al. (2021), entrepreneurial ventures may be defined in various ways, ranging from small businesses to high growth new ventures. It also can operate in practically any field including technology, healthcare, retail and hospitality. It is generally funded by individuals, groups of individuals or big organizations that look forward to branch out into a new product line or market. Günzel-Jensen et al. (2020) further noted that entrepreneurship is essentially in enhancing innovations and economic growth. However, there is a lack of research on the concepts that influence effective use of big data analytics and cloud computing in entrepreneurship. Such motivators include organizational culture, technological readiness, and human capital. Understanding these factors can help entrepreneurs to better leverage these technologies and increase their potential benefits.

In summary, the literature gap in examining the potentials provided by big data analytics and cloud computing in supporting entrepreneurial ventures is the need for more empirical studies that specifically focus on the use of these technologies in entrepreneurship, and the factors that influence their adoption and effective use in this context.

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Based on literary gap above, this current study aimed to examine the potentials provided by big data analytics and cloud computing in supporting entrepreneurial ventures

2. Literature Review

2.1. Entrepreneurial Ventures

Hashem and Freihat (2020) noted that entrepreneurial ventures refer to the creation and development of new businesses or startups with the aim of bringing new products or services to the market. An entrepreneurial venture typically involves identifying a need or opportunity in the market, developing a business model or plan, and securing the necessary resources and funding to launch and grow the business (Block et al., 2021).

Fraccastoro et al. (2021) argued that entrepreneurial ventures take many forms, from small businesses to high-growth startups. They can also operate in a large range of sectors, from technology and healthcare to retail and hospitality. Entrepreneurial ventures can be started by individuals, groups of individuals, or even larger organizations looking to diversify their product offerings or enter new markets. Günzel-Jensen et al. (2020) added that entrepreneurial ventures play an important role in driving innovation and economic growth. By bringing novice services and products to the market, entrepreneurial ventures can create new jobs, generate new revenue streams, and drive technological advancements. Entrepreneurial ventures can also help to address social and environmental challenges by developing innovative solutions to these issues.

However, entrepreneurial ventures also face a number of challenges and risks. These can include limited resources, uncertain market conditions, and competition from established players in the industry. To succeed, entrepreneurial ventures often require a combination of vision, creativity, persistence, and adaptability. In summary, entrepreneurial ventures are the creation and development of new businesses or startups with the aim of bringing novice services and products to the market. These ventures play an important role in driving innovation and economic prosperity; they also face many challenges and risks (Colombo et al., 2019; Schwab & Zhang, 2019).

2.2. Cloud Computing CC

Sadeeq et al. (2021) defined cloud computing (CC) as an innovative service model from which computing resources, applications, software, and storage are accessed through the internet. Contrary to local servers or personal gadgets that may help store data and/or access applications, cloud computing has users receive resources from servers located in data centers worldwide over a network. Cloud services are often offered by third-party contracting parties who bear the responsibility for the underlying hardware and software environments as well as software applications necessary for delivering these services (Rashid and Chaturvedi, 2019). According to Bello et al. (2021), Sharaf and Shilbayeh (2019); Robertson et al. (2021); Akhtar et al. (2021) and Bandari (2022), the idea of (CC) offers several advantages over traditional computing models, including:

Scalability

The flexibility of cloud computing is that services become elastic and can be extended or reduced to satisfy business changes without the need to acquire new hardware and software. Cloud computing is scalable since users can easily increase or decrease the amount of computing resources needed by an organization to meet the business demands. This can prove very useful to companies that experience varying levels of business throughout the year; they easily scale up or down on computing resources without having to do it at an extra cost.

Flexibility

Cloud computing affords choice for organizations in the way that users can access computing resources anywhere there is internet connection. This may allow telecommuting, which in turn can translate to greater output and morale among workers. Cloud computing may also offer options on software and applications deployment since cloud services can be easily linked with existing software and applications.

Collaboration

Collaboration can be made easier because many people can work on the same documents or files at once and from any location provided with an internet connection. Other benefits that organizations experience as a result of cloud-based collaboration tools include easier ways of communication and sharing information resulting in improved productivity and innovation. Another benefit of cloud computing is also the interconnectedness of organizations, where cloud services also link well with third-party applications and services.

Cost savings

The cloud computing service models could offer cost advantage of investments as compared to the traditional computational model due to low capital requirements and fees per usage. Cloud technology can be helpful and require an amount of cost in owning, maintaining and updating the hardware and the IT infrastructure. Rather than setting up costly equipment such as user servers and storage apparatus, an organization can obtain computing resources from cloud service providers where it

pays based on the number of users accessed at any given time. Cloud computing also helps in cutting down other IT expenses because the cloud service provider provides and maintains the IT installation.

Security

The vendors of cloud solutions provide different levels of security for data and applications located in the cloud, for example, encryption and authentication at different levels. Almost every cloud service provider ensures that their service is secure and provides adequate security measures to the clients' information stored on the cloud. It can include encryption of data, firewall protection and use of multiple factors to access services. Also, most cloud providers employ specialized security professionals who manage cloud infrastructure as well as manage security incidents in real-time.

Han et al. (2019) also pointed out that cloud computing is widely adopted in the present generation with many organizations including the small business, large business, and the industrial business among others. Cloud computing has opened avenues for advanced technologies and services which include artificial intelligence, machine learning and the big data analytics that all demand high volume data computation. Zing et al. (2022) argued that there are several examples of how using CC to support innovation and entrepreneurship:

- Providing access to online courses and resources on innovation and entrepreneurship.
- Facilitating collaboration and knowledge sharing among students, faculty, and industry partners.
- Enabling the use of cloud-based tools such as data analytics and machine learning to support innovation and entrepreneurship initiatives.
- Supporting the development of cloud-based platforms for innovation and entrepreneurship, such as incubators and accelerators.

From the perspective of Ali (2020), there are potentials of cloud computing to support innovation and entrepreneurship and provide a framework for creating an ecosystem that can foster innovation and entrepreneurship. In addition to that, authors argued that the importance of collaboration among stakeholders in the ecosystem, and the need for ongoing support from government agencies and industry partners.

2.3. Big Data Analytics

Hashem et al. (2022); Hariri et al. (2019) defined big data analytics as the ability to analyze large volumes of complex data through analytical techniques to enable organizations to uncover latent patterns and correlations that would help in decision making. Big data analytics refers to the utilization of applied software tools and systems that allow one to perform analysis on large data sets and various structures of information derived from text, images, and videos (Wang et al., 2022). At this moment, big data analytics is being widely applied in different fields, such as finance, healthcare, business and e-commerce, marketing etc. Big data analytics can benefit of an organization for seeking out new business opportunities, for improving its operations and for enhancing the customer experience (Fathi et al., 2022).

There are many aspects and characteristics of big data analysis, it included as according to (Lee et al., 2019; Wright et al., 2019; Niu et al., 2021; Saleem et al., 2020; Sheng et al., 2021):

Improved decision-making

Big Data Business Intelligence helps organizations solve problems or make decisions from the analysis of data repositories. The set form of analysis can be in the form of machine learning and predictive analytics with which organizations can analyze data and be in a position to predict the outcome of the data analyzed. When decisions are made with the help of quantitative data, organizations can avoid certain dangers, enhance efficiency, as well as increase productivity.

Enhanced customer experience

The application of big data analytics enables an organization to know and serve its customers better. Successful analysis of customer information will outline the needs, desires and how the customers use the products, which in return help the organizations make informed decisions in issues to do with product advisory, pricing, and customer relations.

Increased efficiency

A significant number of companies believe that big data analysis leads to better functioning and organizational performance. When used appropriately, big data reveals ways organizations can improve their workflows and processes reducing wastage of resources. This in turn can help achieve new economies, enhance efficiency and better organizational performance.

Competitive advantage

Big data analytics can potentially help organizations gain a competitive edge by allowing them to base their decision on big data information as they seek to fend off competition from their rivals. When big data is used to evaluate opportunities to uncover new business opportunities and increase efficiency for internal strategies as well as enhance customer satisfaction, a company is able to set itself apart from its competitors.

Innovation

Big data analytics also aid organizations to uncover new chances by trends and patterns and therefore foster innovation. Through massive and complicated data sets, an organization can achieve reactive intelligence that will help in creating new products or services and define new avenues of reaching out to clients. It also means that organizations can use big data to try out new business models and strategies and indeed come up with more adaptable and stringent approaches.

2.4. Related Studies

Dubey et al. (2020) investigated the effect of big data analytics and artificial intelligence (AI) on operational performance, and how this effect is moderated by entrepreneurial orientation (EO) and environmental dynamism (ED) in manufacturing organizations. The study adopted a survey methodology to collect data from manufacturing organizations in the United States. The survey was administered to senior executives and operations managers in these organizations, and data was collected on big data analytics, AI, EO, ED, and operational performance. The study confirmed that big data analytics and AI have a positive impact on operational performance in manufacturing organizations. The study also confirmed that this effect is moderated by EO and ED. Specifically, the positive impact of big data analytics and AI on operational performance is stronger in organizations with high levels of EO and ED. This suggests that organizations that are more entrepreneurial and operate in dynamic environments can benefit more from big data analytics and AI.

Mikalef et al. (2019) presented a research agenda for confirming business value from big data and business analytics (BDA) in organizations. The study draws on current literature and sectors' reports to identify key research themes and areas of focus for realizing business value from BDA. The authors present a framework for BDA that includes four key components: data management, analytics, decision-making, and value creation. The article then proposed a research agenda for each component, highlighting key research questions and areas of focus. The article highlighted several key themes and areas of focus when it came to the influence of big data analytics in ventures that included:

- Data management: Key research questions in this area include how to manage data at scale, how to integrate data from many sources, and how to ensure data quality and security.
- Analytics: Key research questions in this area include how to develop effective analytics models, how to interpret and communicate analytics results, and how to address ethical and privacy concerns related to analytics.
- Decision-making: Key research questions in this area include how to integrate analytics into decision-making processes, how to develop decision support systems that are intuitive and user-friendly, and how to ensure that decisions are aligned with organizational goals.
- Value creation: Key research questions in this area include how to measure the value of BDA initiatives, how to identify and prioritize high-value use cases, and how to ensure that BDA initiatives are aligned with overall business strategy.

Dong and Yang (2020) examined the business value of (BDA) depending on a systems-theoretic approach and empirical testing. The study depended on systems-theoretic approach to enhance a theoretical framework for examining the business value of BDA. The framework included three components: input, transformation, and output. The study used data from a survey of 230 companies in China. The study confirmed that the "input component" of the framework, which includes data quality, data amount, and data diversity, has a positive effect on BDA capabilities. The transformation component of the framework, which includes analytics capabilities and IT support, has a positive effect on BDA outcomes. The output component of the framework, which includes strategic value and operational value, has a positive effect on business performance.

Zing et al. (2022) examined the ecosystem of innovation and entrepreneurship education in universities based on CC. The study draws on case studies from universities in China to provide examples of how CC is used to support innovation and entrepreneurship education. The article highlighted the importance of creating an ecosystem of innovation and entrepreneurship education in universities, which includes a range of stakeholders such as students, faculty, industry partners, and government agencies. The study proposes that CC plays a key role in supporting this ecosystem, by providing access to tools and resources that can support innovation and entrepreneurship education.

Amoako et al. (2021) proposed a conceptual framework to analyze the impact of Artificial Intelligence (AI) on the entrepreneurial decision making process in an emerging market, especially in relation to customer preference, industry benchmark, and employee involvement. This was an article of conceptual nature, and it derives concepts from prior theory to come up with an integrated conceptual model for studying the effect of AI on entrepreneurial decision-making. The framework includes three key factors: customer choice, business standard and clerical staff engagement, respectively. Based on these factors, this article analyses how these factors affect the application of AI in decision-making processes for entrepreneurial ventures and underscores how they can be moderated. About the article, it suggested a framework that could be used to analyze the impact of AI in entrepreneurship decision-making, which was discovered to have several themes and issues. These include:

- Customer preference: The article suggests that AI is used to analyze customer preferences and behavior, and that this information can be used to inform entrepreneurial decision-making. However, the article also highlights the need for ethical considerations when using AI to analyze customer data.

- Industry benchmark: The article suggests that AI can be used to analyze industry benchmarks and trends, and that this information can be used to inform entrepreneurial decision-making. However, the article also highlights the need for caution when relying on industry benchmarks, as they may not always be relevant or accurate.
- Employee involvement: The article suggests that employee involvement is critical for the effective use of AI in entrepreneurial decision-making. This includes ensuring that employees are trained to use AI effectively, and that they are involved in the decision-making.

Picoto et al. (2021) aimed to examine factors that influence cloud computing and enterprise mobility and impact on organizational performance. Survey method was adopted and applied to Portuguese organizations. Study revealed the positive influence of the technological, organizational and environmental elements of the TOE framework on CC use and enterprise mobility. Study confirmed that innovative differentiation orientation has a positive effect on cloud computing use and enterprise mobility, but a cost reduction strategy has a negative effect on cloud computing use and enterprise mobility. The paper also brought out evidence that supported the proposition that the use of cloud computing and enterprise mobility enhances organizational performance.

Taking the case of cloud computing in high tech startups, Ferri et al. (2020) discussed its advantages and disadvantages. The authors followed their research with a case study of a high tech startup company which had recently implemented cloud computing across its business processes. The authors interviewed important members of the company and reviewed documents concerning the use of technology to examine the pros and cons of cloud computing. The authors realized the various advantages of cloud computing to the high tech startup, such as flexibility, scalability and cost effectiveness. But they also discovered that there were some issues which have been linked to implementation of cloud computing consisting of some of the concerns relating to data safety and skills needed in order to implement it. In sum, it becomes clear that cloud computing is indeed one innovation that can be beneficial to high tech startups but, the authors recommend that necessary paradigms should be opened to weigh the advantages against the disadvantages before adopting this technology.

Ciampi et al. (2021) tried to examine big data analytics capabilities and business model innovation through the mediating role of entrepreneurial orientation. Primary data were taken from 303 firms in Vietnam. Study confirmed that data analytics capabilities had a positive effect on business model innovation and that this was partially explained by entrepreneurship orientation.

2.5. Model and Hypotheses

Launching from the literary gap and related study, author was able to highlight the relationship between variables through building the following model – Fig. 1 – from which hypotheses were extracted:

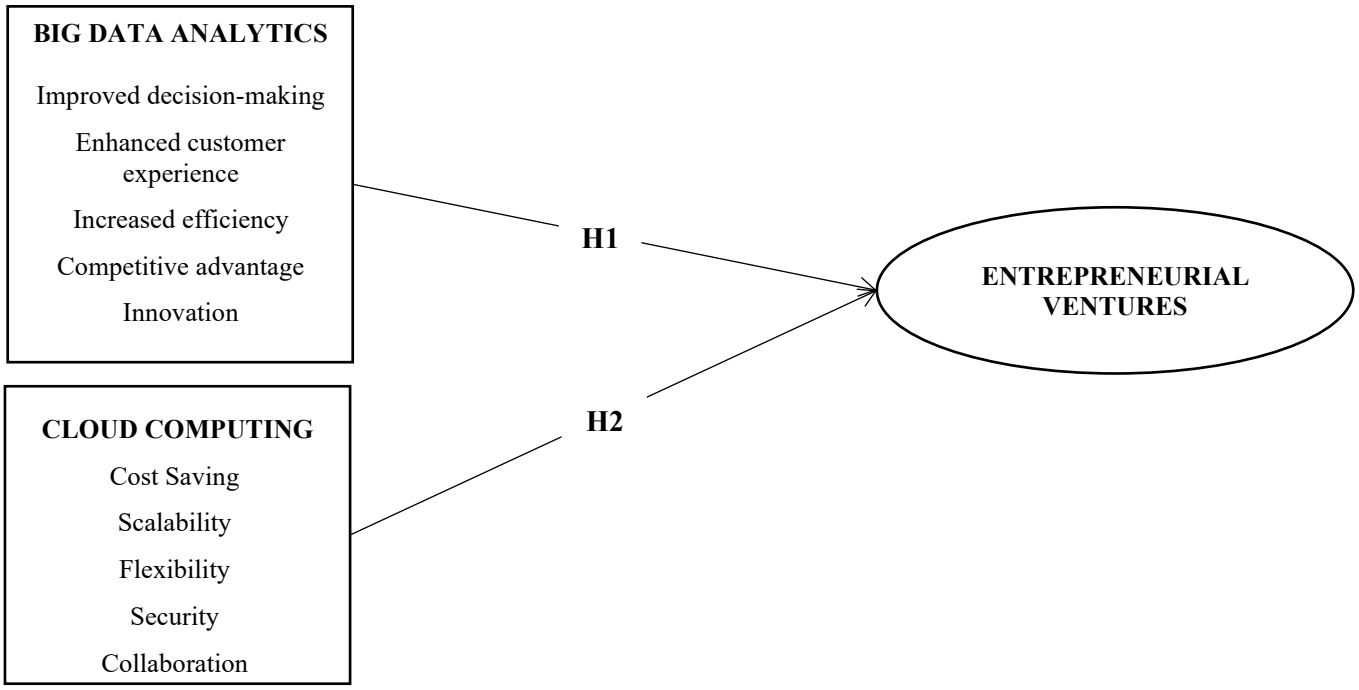

Fig. 1. Study Model (Wright et al., 2019; Sharaf & Shilbayeh, 2019; Saleem et al., 2020; Robertson et al., 2021)

H_1: *Big data analytics drivers can increase potentials of entrepreneurial ventures from the perspective of managers.*

H_2: *Cloud computing drivers can increase potential of entrepreneurial ventures from the perspective of managers.*

3. Methods and Materials

3.1. Methodological Approach

Quantitative methodology was used in order to obtain as much primary data as possible from a larger sample size.

3.2. Population and Sampling

Population of study consisted of operational managers in (5682) entrepreneurial organizations operating in Saudi Arabia. A convenient sampling technique was used to select (400) operational managers as the sample population. After applying the tool, the researchers were able to retrieve (333) completed filled questionnaires that were valid for statistical tests. This is found to be a response rate of (83.2%) as is statistically accepted.

3.3. Tool of Study

To gather primary data from the respondents, a questionnaire was selected to be the primary method. Based on previous studies, researchers developed the questionnaire, and the scale used was Likert five-point scale. These questions were displayed under two major headings. The first was based on study sample demographics (age, gender, qualification and experience). While the other section presented statements related to study sub-variables as according to the following Table 1:

Table 1
Statements' Distribution on Variables

Variables	# of Statements	Variables	# of Statements
Big Data Analytics		**Cloud Computing**	
Improved decision-making	4	Cost Saving	4
Enhanced customer experience	4	Scalability	4
Increased efficiency	4	Flexibility	4
Competitive advantage	4	Security	4
Innovation	4	Collaboration	4
ENTREPRENEURIAL VENTURES	7		

3.4. Statistical Processing

Statistical package for social sciences SPSS was used in order to screen and analyze the gathered primary data. Cronbach's Alpha was employed in order to test the reliability and consistency of the study tool. Because it was higher than the required minimum percentage of 0.70, the alpha value assigned to each variable in the following table was exceptional (Sekaran & Bougie, 2016):

Table 2
Alpha Value

Variable	alpha
Big Data Analytics	0.756
Cloud Computing	0.959
Entrepreneurial Ventures	0.874

Other statistical tests included:

1.Percentage and frequency 2.Mean and standard deviation 3.Multicollinearity test 4.Multiple regression

4. Results and Discussion

4.1. Demographics

Table 3 presented frequency and percentage of respondents to the questionnaire. It was seen that respondents were above 40 years old forming (30.9%) of the sample. Most respondents held a BA degree forming (56.2%) of the total sample with an experience in the field that was more than 14 years forming (44.7%) of the sample.

Table 3
Demographics of Study

		f	%			f	%
Age	22-27	66	19.8	**Experience**	2-5	42	12.6
	28-33	69	20.7		6-9	99	29.7
	34-39	95	28.5		10-13	43	12.9
	+40	103	30.9		+14	149	44.7
Educational Level	High school	91	27.3				
	BA	187	56.2				
	High studies	55	16.5				
	Total	333	100.0				

4.2. Questionnaire Analysis

Mean and standard deviation were used in the following Table 4 in order to examine the responses to study questionnaires. It was seen that all statements and variables scored higher than mean of scale 3.00. The highest variable scored mean of 3.47/5.00 (improved decision-making) compared to the lowest mean scored by (enhanced customer experience) with mean of 3.28/5.00 but still positive as it scored higher than mean of scale.

Table 4
Questionnaire Analysis

Big Data Analytics BDA		
BDA can help entrepreneurs make better decisions	3.306	1.120
BDA provides insights into customer behavior, market trends, and business performance	3.411	1.502
By analyzing large sets of data, entrepreneurs can identify patterns and trends that may not be apparent through traditional means	3.817	.784
BDA enables entrepreneurs to make more informed decisions that can lead to better outcomes	3.372	1.380
Improved Decision Making	**3.477**	**.631**
BDA can help entrepreneurs understand their customers better	3.438	1.084
BDA analyzes customer behavior and preferences	3.450	1.354
By using BDA, entrepreneurs can provide personalized recommendations and experiences to their customers	3.240	1.545
BDA leads to increased satisfaction and loyalty.	3.018	1.384
Enhanced Customer Experience	**3.287**	**.396**
BDA helps entrepreneurs optimize their operations and increase efficiency	3.474	1.559
analyzing data on business processes and operations can identify areas for improvement	3.441	1.275
BDA implements changes that can lead to cost savings	3.441	1.215
Employing big data analytics can increase productivity.	3.357	1.521
Increased Efficiency	**3.429**	**.754**
BDA provides entrepreneurs with a competitive advantage	3.856	.873
It enables entrepreneurs to make data-driven decisions and outmaneuver their competitors	3.144	1.447
BDA depends on using data to gain insights into market trends and customer behavior	3.480	1.121
BDA helps entrepreneurs develop strategies effective than those of their competitors	3.273	1.384
Competitive Advantage	**3.438**	**.507**
BDA has the ability to spark innovation	3.282	1.532
BDA provides entrepreneurs with new ideas and insights	3.159	1.383
BDA analyzes data on customer behavior and preferences	3.532	1.530
Through BDA entrepreneurs can identify new product or service opportunities	3.375	1.271
Innovation	**3.337**	**.983**
Could Computing CC		
One of the main drivers of CC is cost savings	3.526	1.196
With CC, entrepreneurs can avoid the high upfront costs associated with building and maintaining their own IT infrastructure	3.045	1.597
With CC, entrepreneurs can pay for the services they need on a pay-as-you-go basis	3.904	.933
CC allows entrepreneurs to scale up or down as needed and reduce overall IT costs.	3.084	1.460
Cost Saving	**3.390**	**1.049**
CC offers entrepreneurs the ability to scale their operations quickly and easily	3.625	1.146
With cloud computing, entrepreneurs can quickly add or remove resources	3.042	1.478
CC enables entrepreneurs to meet changing business needs	3.195	1.572
CC enables entrepreneurs not to worry about the underlying IT infrastructure.	3.375	1.389
Scalability	**3.309**	**1.185**
CC provides entrepreneurs with the flexibility to work from anywhere, at any time	3.174	1.637
CC facilitates the process for entrepreneurs who travel frequently or have remote teams	3.592	1.395
CC allows entrepreneurs to access their data and applications from anywhere with an internet connection	3.541	1.252
CC is effective in reducing costs of traveling and furnishing offices	3.225	1.576
Flexibility	**3.383**	**1.168**
CC providers often have more robust security features than entrepreneurs can afford to implement on their own	3.952	.884
By using cloud computing, entrepreneurs can benefit from the security measures	3.087	1.481
CC is beneficial in terms of backup and disaster recovery	3.640	1.157
CC supports data encryption, and access controls	3.012	1.475
Security	**3.423**	**1.039**
CC facilitates collaboration among team members	3.285	1.481
SMEs can use a centralized platform for sharing data and working together on projects through CC	3.520	1.318
CC improves productivity and efficiency	3.147	1.626
By depending in CC, teams that are geographically dispersed can work simultaneously	3.580	1.381
Collaboration	**3.383**	**1.217**
Entrepreneurial Ventures		
Entrepreneurial ventures often use cloud computing to host their websites and store their data	3.3393	1.17023
leveraging both cloud computing and big data analytics, entrepreneurial ventures provide personalized recommendations and experiences to their customers	3.1952	1.59471
entrepreneurial ventures who rely on cloud computing and big data analytics enjoy an increased satisfaction and loyalty of customers	3.8829	.82219
Entrepreneurial ventures often use cloud computing to host their platforms and store their data	3.2162	1.48733
By leveraging both cloud computing and big data analytics, entrepreneurial ventures provide personalized advice and services to their customers	3.5165	1.12094
Transportation and logistics in entrepreneurial ventures often use cloud computing to manage their operations and store their data	3.1742	1.49083
Entrepreneurial ventures use big data analytics to optimize their delivery routes and improve efficiency	3.3784	1.56806
Entrepreneurial Ventures	**3.3861**	**1.01880**

4.3. Hypotheses Testing

The two main hypotheses of study were tested depending on multiple regression – Table 5. The first hypothesis indicated an F value= 15.85 that was significant at the 0.05 level, indicating that *"Big data analytics drivers can increase potentials of entrepreneurial ventures from the perspective of managers within entrepreneurial ventures"*. r= 0.442 was moderate and that the independent variables account for **19.5%** of the variation in the dependent variable. As for the second hypothesis of study, F value= 53.178 was significant at the 0.05 level, indicating that *"cloud computing drivers can increase potentials of entrepreneurial ventures from the perspective of managers within entrepreneurial ventures"*. r= 0.67, was strong and the independent variables account for **44.8%** of the variation in the dependent variable.

Table 5
Hypotheses Testing

Coefficients

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	R	R Square
1	(Constant)	2.965	.509		5.826	.000	.442[a]	.195
	Improved decision-making	**.551**	**.155**	**.341**	**3.550**	**.000**		
	Enhanced customer experience	.746	.171	.290	4.363	.000		
	Increased efficiency	.134	.140	.099	.952	.342		
	Competitive advantage	-.711	.144	-.354	-4.924	.000		
	Innovation	-.587	.092	-.567	-6.418	.000		

H_1: *Big data analytics drivers can increase potentials of entrepreneurial ventures from perspective of managers.*

Coefficients

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	R	R Square
1	(Constant)	1.363	.149		9.121	.000	.670[a]	.448
	Cost Saving	-.049	.113	-.050	-.429	.668		
	Scalability	-.087	.089	-.101	-.979	.328		
	Flexibility	**.383**	**.095**	**.439**	**4.047**	**.000**		
	Security	.133	.117	.135	1.135	.257		
	Collaboration	.215	.086	.257	2.504	.013		

H_2: *Cloud computing drivers can increase potentials of entrepreneurial ventures from perspective of managers.*

4.4. Discussion

This research aimed at examining the potentials given to entrepreneurial ventures through big data analytics and cloud computing. Quantitative methodology was adopted and (333) operational managers within entrepreneurial ventures answered the questionnaire. SPSS was used to process primary data. Results of study accepted the main hypotheses of study arguing that cloud computing and big data analytics unlock many potentials for a more successful entrepreneurial venture. Results also indicated that cloud computing was more influential with r = .670 with **44.8%** of the variation in the dependent variable compared to big data analytics scoring r = 0.442 with **19.5%** of the variation in the dependent variable.

This study affirmed that big data analytics affect entrepreneurial enterprises in many ways, such ways being assisting entrepreneurs with better decisions. The outcome pointed out those big data analytics aided the business leaders to have better information to make better decisions. It is possible through big data analysis; entrepreneurs can untangle various patterns and trends that can be considered when making decisions and in the process minimizing risks that accompany the business. Apart from that, the use of big data analysis can make entrepreneurs comprehend more of their customers and even give them values they need to give their customers in terms of values. They also identified that big data analytics can assist the entrepreneurs for improving their organizational performance also big data analytics provide better competitive advantage for the entrepreneurial enterprises by their aptitude to make the better executive decisions based on the big data analysis and avoid competitors. According to the nature of big data analytics, the variables include better decisions, better customer experience, better efficiency, better competition, and innovation. The most important change, which seemed to have had the greatest impact, was used as improved decision-making that can offer the entrepreneur real time information of his economy and environment, in order to enable the entrepreneur to have better information and control risks of business.

It is also possible to state that the Study being effective in confirming 5 aspects of potentials of cloud computing to entrepreneurial ventures that embrace such aspects such as Cost Saving, Scalability, Flexibility, Security and Collaboration. This enables entrepreneurial ventures to cut on their expenditure, especially on internal IT investment by availing these services online. They cannot afford to own the infrastructure required for their business, yet they can hire the resources they need from the cloud on a pay-as-you-go basis. Furthermore, through cloud computing entrepreneurial ventures can have the ability to expand or minimize their utilization of IT assets almost instantly. This results in efficient utilization of resources to meet the demands that are experienced, and it also speeds up avoiding over investment in its resources as a business prepares for a surge in demand. In addition to that, results found that cloud computing opens the potentials of collaboration between team members, regardless of their physical location. Entrepreneurs can use cloud-based tools to share files, communicate in real-time, and work together on projects, making it easier to collaborate with remote team members and partners. The highest variable of influence among cloud computing was flexibility which the study proved that flexibility is one of the key benefits that cloud computing offers to entrepreneurial ventures.

5. Conclusion and Recommendations

5.1. General Conclusion

Big data analytics BDA and cloud computing CC are enabling technologies that help unlock potential of entrepreneurial ventures. This can appear through getting the use of the massive amounts of data available and the on-demand, scalable computing resources of the cloud, startups and small businesses can gain valuable insights into their operations, customers,

products, and services. They can make data-driven decisions, optimize key business processes, reduce costs, improve productivity, and ultimately scale their operations. With the power of BDA and CC, entrepreneurial ventures achieve sustainable growth and success.

5.2. Recommendations

Launching from discussion and conclusion above, researchers suggest the following:

- Investing in education and training programs help entrepreneurs catching up with modern technologies and best practices in these areas.
- Entrepreneurs should encourage a culture of data-driven decision-making in their organizations.
- Entrepreneurs should prioritize data privacy and security to protect their sensitive business information and that of their customers.
- Entrepreneurs should align their use of cloud computing and big data analytics with their overall business strategies.

5.3. Theoretical and Practical Implications

Examining the potentials provided by BDA and CC in supporting entrepreneurial ventures has both theoretical and practical implications. From a theoretical perspective,

Develop a better ingestion of the effect of technology on entrepreneurship: By evaluating potentials of the BDA and CC it is possible to get a better understanding of technology effects on entrepreneurship. In this way, comprehending how such technologies help the entrepreneurs to foster growth and create a competitive edge, the researchers themselves could build adequate theories and frameworks linking the technology and the entrepreneurship.

Evaluate the role of technology in shaping the entrepreneurial ecosystem: Technology is currently influencing the entrepreneurial environment and exploring the potentials of utilizing big data analytics and cloud computing present academic researchers with a unique opportunity of studying potentials informing the changes in the entrepreneurial environment. When observing these technologies in actual use by entrepreneurs, researchers can then identify just what elements are fostering entrepreneurship and innovation. As for the practical perspective, the study might be useful in terms of providing guidance to entrepreneurs on how to leverage technology: Analyzing the opportunities that big data analytics and cloud computing open shows practical recommendations to the common user-entrepreneur on how to implement these technologies for businesses. Through the analysis of singular cases, researchers describe the usage of technology by successful companies to help entrepreneurs make appropriate decisions in terms of increasing effectiveness.

5.4. Limitations of Study

Current research was limited to entrepreneurial ventures operating in Saudi Arabia through the fiscal year 2023-2024. Study was also limited to managers within entrepreneurial ventures who were aware of entrepreneurship.

5.5. Future Research

Based on the conclusion and results of the current study, researchers suggest the following opportunities as future research:

- Examine the role of CC and BDA in facilitating international entrepreneurship
- Investigating the impact of CC and BDA on social entrepreneurship
- Study the adoption and implementation of CC and BDA in entrepreneurial ventures.
- Examine the use of CC and BDA in financing entrepreneurial ventures
- Study the use of CC and BDA in supporting sustainable entrepreneurship

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