Effect of Cloud computing technology adoption on Reduction in Costs: A critical review from the perspective of business

Rajesh Gharpure[a*], Dr. Manjushree Ghodke[b]

[a] Faculty of Management, Symbiosis International University, Pune, India
[b] Independent Economics Consultant, Pune, India
Email: [1]rsgharpure@gmail.com

Article History: Received: 10 January 2021; Revised: 12 February 2021; Accepted: 27 March 2021; Published online: 28 April 2021

Abstract: Digital technologies have significantly contributed towards enabling organizations achieve business excellence objectives. Among technologies that most organization pursue to achieve these goals of performance and flexibility; cloud computing has emerged as a front runner in recent years. Cloud computing technology has a significant effect on organizational performance, and this can lead to improvement in the financial performance as well. This paper aims to presents the effect of adopting Cloud computing technology on reduction in costs from the business perspective. The review findings show that the most perceived benefits of cloud computing are realized through cost savings. However, there is an observed lack of well-defined methodology to accurately estimate cost reduction benefits accruing through cloud technology adoption for an organization. Therefore, it is suggested that further research should be attempted to establish methods to estimating the cost reductions leading to higher profit margins and better financial performance of organizations.

Keywords: Business excellence, Digital Technology, Digital technology adoption, Cloud computing technology, Business performance, Cost reduction, Business organizations, Technology adoption

I. Introduction

To stay competitive in the present technologically developed century, organizations are required to exert efforts for constant improvement and performance as per the defined excellence standards (Mohammad et al., 2011). Business excellence has emerged as the strongest medium to accomplish competitive benefits for companies and it is referred to as the mechanism for better business among all associated parties such as employees, customers, society and stakeholders (Pozega et al., 2014). It is the better performance of organizations that assists them in achieving business excellence. For understanding Business Excellence, it is essential to determine the fundamental values and ideas that enable the relevant Business Excellence Models (Jankalová & Jankal, 2020). It is a recurring challenge in the business sector to determine the best possible elements that enable companies to attain and sustain competitive advantages and pursue Business Excellence on the basis of success and exceptionality. It is observed that business organizations are accomplishing excellence by means of technology in their business through digital technology adoption (Ali, 2019). Powered by distinct attributes and accessibility, focus of business organizations in adopting digital technologies is not solely to improve internal operations, but also to inflate internal aspects like employee experience, outreach customers and external stakeholders, enhance services, amalgamate processes, influence markets, and basically alter the sector (Ivančić et al., 2019).

Presently, digital transformation has matured from a theoretical concept to a leading-edge influential aspect that is transforming organizations as well as their business excellence models (Kurmann & Arpe, (2019). As stated in a study performed by the Massachusetts Institute of Technology, digital technology based organizations are 26 percent more profitable in comparison to the normal organization. Emerging latest digital technologies namely social, mobile, analytics and cloud are affecting the organizations significantly. Latest technologies have launched business model innovations leading to better financial outcomes (Schwertner, 2017). Cloud computing is one of the most discussed and promising IT innovations in the current technology market (Khan & Jiong, 2019). After adoption of cloud computing, businesses have the possibility of improving the use of computing resources, reducing capital expenditures, reducing maintenance and operational costs, and improving efficiency through dynamic deployment and recovery capabilities of computing resources (Chen et al., 2016). Therefore, this paper is aimed at understanding cost reduction benefits accruing through cloud technology adoption.

For this paper, the following sections define associated concepts, discover the significance and benefits of digital transformation adoption for business excellence, and further discuss the benefits of cloud computing technology with specific effect on cost reductions for business organizations.

II. Methodology and Scope

With the purpose of attaining an in-depth understanding of the effect of Cloud computing technology adoption on reduction in costs from the business perspective a large number of previous research studies were identified and reviewed. Articles were searched from the electronic database of EBSCO, Science Direct, Emerald,

International Journals on economics, finance, science, and technology and also Google Scholar. The analysis of all the studies were performed in stages to extract the appropriate studies to interpret relevant information and data that can facilitate valuable conclusions. In the 1st stage, over 1000 studies were found that were related to this research area. After the 2nd stage, around 250 studies were selected that were found appropriate in relation to cloud computing and also related to keywords of this study such as 'Business excellence', 'Digital Technology', 'Digital technology adoption', 'Cloud computing technology', 'Business performance', 'Cost reduction', 'Business organizations' and 'Technology adoption'. In the last stage, 45 articles were finalized after removing duplicate studies covering similar concepts and from the time period of 2010 to 2021.

III. Literature Review

Business Excellence and its benefits

Business Excellence is linked with all those processes, techniques and strategies that enable an organization to achieve excellence in everything performed by an organization such as leadership, strategies, focus on customer, information management, people and processes. (Mann et al., 2012). Organizations implement the appropriate Business Excellence Models to evaluate and enhance their business functions, practices and performance (Mohammad et al., 2011). As per Talwar (2011), in the past few decades, business excellence models have been considered as an effective medium to attain excellence in different business sectors globally. The establishment of Business Excellence Models have improved their product quality and have also led to increase in their market share, sales, profits, employee productivity and competitiveness as an outcome. It is through business excellence that the Organisations attain high levels of quality at each level. However, it is identified that organizations possess the knowledge and required understanding for business excellence but lack taking initiatives for a systematic approach and implementation (Pozega et al., 2014). As it is recognized from business practices that excellence is among the multiple management elements, identifying the areas of improvement by checklists helps the organizations to concentrate and assess the present state of Business Excellence (Vartiak & Jankalova, 2017). Bandyopadhyay & Nair (2015) performed a literature review-based study and the study outcomes highlighted the relevant practices and processes that have the potential for improved business performance outcomes.

Hence, for organizations to achieve excellence, disruptive innovations are considered as a means to follow the dynamics of the current environment (Ostojić Mihić et al., 2015). In the present era of digitalization, business organizations achieve excellence by following technology for the business functions namely through Digital Transformation (Ali, 2019). As per Gartner (2018b) report, the top priority of around eighty-seven percent (87%) of the business leaders is the digital transformation for achieving business excellence. This is due to the ease of interconnection and access to capabilities, resources and talent anytime anywhere by means of digital technologies. Therefore, digital transformation has emerged as the key means of altering the way of achieving business excellence. (Bongiorno et al., 2018).

Significance of digital technology and its need for adoption

Digital transformation leverages people, process and technology for collecting and spreading information with data-driven decisions, automation of the processes to eliminate human-errors and increase in accuracy, speed, and reliability of the business processes (Ali, 2019). According to Laudon & Laudon (2013), a digitally equipped business is either partially or fully digitally transformed, a profit or not-for-profit organization which handles its significant business processes as well as relations with its vital stakeholders through digital technology medium.

Digital transformation history starts in the 1950s with the unification of computer hardware and software. In the mid-1990s, further stages of Digital transformation were established with the global expansion of the internet accompanied by the introduction of mobile internet in 1998. The application of novel and innovative technologies concurrently affected the private as well as public organizational environment (Gibe & Kalling, 2019). There are various benefits of implementing digital technologies within organizational functions such as stronger experimentation potential, more dispersed technological innovation and higher level of business model innovation (Markides & Sosa, 2013).

As per Westerman et al. (2011), most of the digital technology based efforts and initiatives are focused on reconsidering customer experience, operational processes and business models. However, according to Tolboom (2016), the highest effect of digital transformation is anticipated on the value proposition of the organization, identification and service to the customer segments, organizational means to reach to their customers, and the type of resources utilized. Accordingly, Tolboom (2016) argues that the effect of digital transformation is expected on products and services to customization, performance, accessibility and convenience.

It is determined that digital technologies impact consumer behaviour that eventually is an important aspect for digital transformation within organizations and affects their interlinkages with the customers (Lucas et al. 2013). Moreover, consumers are combining digital technologies within their lives at an increased rate which is resulting

in a higher level of digital density (Piccinini et al. 2015). Berman & Marshall (2014) states that it is because of new digital technologies that the organization's value chains are more transparent and easier to mould. These attributes lead to value chain disruptions in more specific elements and functions. Organizations are exploiting new revenue models at an increased rate and better technological mediums for value creation (Li, 2015). Digital technologies are enabling the organizations to have the likelihood to utilize infrastructure and softwares as a service, eventually leading to a decrease in physical resources leading to cost reduction. Moreover, latest technologies such as cloud solutions are appearing to be cost-effective and facilitating economies of scale by replacing time-consuming and costly infrastructure installations (Bharadwaj et al. 2013). According to Kurmann & Arpe (2019), digital transformation possesses multiple understandings, transforms the customer perspective for organizations, acts as a promoter for business model variations, enables appropriate strategies, and provides key success factors for organization.

Priyono, et al. (2020) explains that the capabilities of digital technology has been recognized with time and it is difficult to precisely define the shortening time gap between the emergence and utilization of digital technology, its journey path, and the final destination of digital transformation. Business model transformation in assistance with digital technology has been evidently recorded in the research domain as the most vital strategies to react to disruptive environmental variations observed.

Bican & Brem (2020) argue that due to deep technology aspects being associated with digital phenomenon, digital technology lays the foundation for innovation in platform and digital environments. The most common digital technologies categorized are mobile, social media, cloud, and data analytics. Digital technologies are attributed to be highly interconnected, facilitating and improving information processing proficiencies. Applying and developing on present and well-known technologies can lead to digital innovations.

Popović-Pantić et al. (2020) explains that digital technologies enable innovative creation which has the potential to strengthen economic development. The amalgamation of digital technologies within routine functions has appeared to be a key success element for sustainable development, market positioning, and advancement. Ongori & Migiro (2010) argues that ICT adoption and the business digital transformation are significant components in developing business strategies, promoting creativity and innovation, and improving competitiveness that leads to a further competitive position within the globalised market and better financial performance of the organization. Schwertner (2017) affirms that those organizations which include big data, cloud, mobile, and social technologies as their crucial elements of the infrastructure, these technologies yield profit on average with higher revenues, and help to achieve a bigger market valuation than competitors for the organization. Cloud computing is among the new technologies utilized by the companies and it is being predicted that companies from all vertical markets and different sizes will increasingly be dependent on public cloud services. Real and substantial economic benefits are accessible for organizations from the adoption of cloud as recorded from the EU based organizations. The graph below (Figure. 1) shows Cloud computing Hype cycle, which was published by Gartner in 2019. It demonstrates the longevity of cloud technologies.

Figure. 1 Cloud adoption survey (Source: Attaran & Woods, 2019)

Adoption of Cloud Computing for business and its benefits

Schwertner (2017) defines cloud computing as a model that facilitates convenient, access to on-demand network which comprises a shared group of configurable computing resources namely networks, servers, storage, applications, and services which can be provisioned quickly and released with minimal management efforts or service provider interactions. Choudhary et al. (2014) assist in resolving issues such as dynamically generated high-performance computing platform, virtualized computing resources, and combination of high-performance computer management technology with the conventional ones. They further stated the advantages of cloud computing and the most significant ones include reduced setup costs and ease of adoption and access to information with unlimited storage.

Ghalimi (2010) explains that there are multiple advantages related to cloud computing and these benefits can be assessed on the basis of three dimensions which are reduction in the cost of IT by conversion of IT investments from the capital expenses to operational expenses, improvement in the end-user experience and cloud computing facilitating companies to focus on their core competencies. The further strategic benefits associated with cloud computing comprises IT decapitalization, accessibility, business agility, scalability, and cost-effectiveness.

Aljabre (2012) argued that even though digital transformation is much needed by business organizations to succeed and earn profits, in the present business sector setting which is affected by economic volatility and losses, there is an emergent requirement of reliable yet affordable technology. Aljabre (2012) further claimed, cloud computing has appeared to be filling that void of affordable technology by offering reliable customers services at flexible prices that does not cost high. Numerous companies are making use of cloud computing technology and in different modes. Aljabre (2012) further stated that different large business organizations have raised their concerns over utilization of cloud computing in business activities and the concerns were related to initial start up expenses and data center limitations. It is observed that the primary start up cost for big companies might be expensive due to switching between any services can incur new costs and be time consuming. Nonetheless, the long-term expenses of switching services are more profitable for big business organizations that want to execute the shift. On comparing the costs of Google Apps and Microsoft Office Professionals in terms of the switching services cost, it is identified that Google Apps costs just $50 per user per year in comparison to Microsoft Office Professionals retailing at $499.00. Etro (2009) agrees that such reductions in the business are able to further reduce the amount of space, equipment and energy required to run the same business but in an economical and effective way. Further he suggested, cloud computing technology facilitates businesses the required competencies to offer standardized and lower cost services.

Chang et al. (2014) explain that due to progression in information and communication technology, companies are no longer setting up their own costly large server and are adopting the external professional supplier of cloud

computing technology. It is evident that organizations or providers commit to improve their organizational resources, work and financial performance after they announce adoption of cloud computing within the market. Chang et al. (2014) performed a study to understand the financial performance impact of cloud computing technology and the outcomes revealed that cost structure of providers and return of sales of user samples have been significantly improved. However, the study suggested that cloud computing technology cannot display vital effects on financial performance in a short time. Mirrazavi & Khoorasgani (2016) investigated the effect of cloud computing technology on the performance of organizations and the study results displayed that adoption of cloud computing technology significantly influences the organizational performance in a positive manner including the financial performance. The study suggested that by outsourcing technology systems to cloud providers, organizations can significantly improve their financial performance and also decrease their support costs of the technology sector.

Effect of cloud computing technology adoption on reduction in costs

Goldfarb & Tucker (2019) argues that organizations adopt digital technology if the benefits include increased productivity, speed, ease of sharing and storing information, and reduction in errors through automation. All these advantages lead to lower cost structure and increased revenues for businesses. One of the advantages determined by cloud computing technology is the reduction in hardware costs along with further costs. Sopia et al. (2016) performed a study to identify the impact of cloud computing on the acquisition costs of computer accessories and infrastructure support costs for providers. The providers agreed that cloud computing reduces server costs and responded with a positive attitude towards the cloud computing technology in cost reduction. These cost reductions were in relation to operating system, security, maintenance, storage and configuration. It also reduces the cost of client machines, antivirus and configurations, cost of printer, acquisition and ink, paper and configuration and software costs. Further, Sopia et al. (2016) stated that within an organization, there is huge investment on the set-up of local and wide area networks,structured cabling, data transfer rates, virtualizing shared resources and network performance. On assessment of the level of cost of infrastructure reduction on cloud services to organizations, it was identified that cloud computing reduces network resources costs such as WAN costs, data transfer rate, network performance improvement, structured cabling, virtualization and thin client architecture. The study further suggested that organizations should adopt cloud computing services for reduction in total cost of ownership of computers and its accessories, network resources, infrastructure and server. Kalaskar (2019) performed a study to develop a model to assess the cost-benefits to decide if cloud computing is acceptable for business organizations and introduced the template that can be used by organisations in three levels of cost-benefit assessment. The model below (Figure 2.) presents the details of the cost benefits analysis.

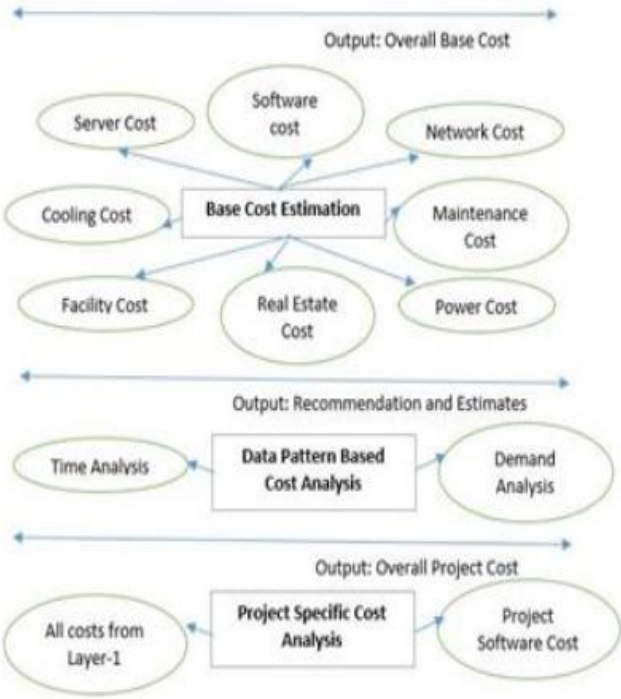

Figure 2. Three Layer Model for Cost-Benefit Analysis

Weintraub & Cohen (2015) explains that the service providers existing in the Cloud computing technology sector offer customer services by maximizing their revenues however organizations as their customers in case of

outsourced cloud computing, wish to reduce their costs. Gill et al. (2015) examined the developing themes within financial services technologies and the study outcomes revealed that cloud computing as a technology appears to be a cost-effective infrastructure affording capital efficiency for financial services providers. Yang & Tate (2012) performed a descriptive literature review on cloud computing technology and researched 205 refereed journal articles. The research findings reveal that cost saving is the strongest incentive for organizations pursuing cloud computing technology adoption. Weintraub & Cohen (2015) explains that cloud computing services are generally classified into three groups namely SaaS(Software as a service), PaaS (Platform as a Service) and IaaS (Infrastructure as a Service) where every service is associated with a particular group, and is offered for definite prices. Their study proposed three cost minimization models for cloud computing customers as cost reduction is perceived as the most vital aspect of cloud computing technology adoption. Khan & Jiong (2019) also affirms that various organizations are intended to reduce their processing costs by means of virtualization. The most effective means of reducing the cost of computing is through cloud computing technology. Cloud computing is associated with reduction of costs by reducing administration and infrastructure costs and improved utilization. Widyastuti & Irwansyah (2018) stated that among the benefits of cloud computing, the most perceived is the cost savings as it has the potential to reduce capital expenditures, such as procuring computers with high performance and purchasing of own servers. Moreover, in few of the services from outsourced service providers, the server can be used for free and there is a provision of increasing the capacity when the demand of the organizations increases. Therefore, the cost efficiency achieved through cloud computing can ultimately increase the competitiveness of the organizations as organizations can allocate their saved funds and technical focus on other areas that further impact for the organization. Widyastuti & Irwansyah (2018) summarized the benefits from cloud computing as cost saving through rental services, purchase of new software licenses, and trial services.Further benefits indirectly affecting the financial performance of companies comprise deepening the niche of the existing market, increasing competitiveness, flexibility/ scalability, high level of data security, and reliability.

IV. Analysis and Discussion

As achieving business excellence is the motive of all kinds of business organizations, different sizes of businesses including self-storage operators, are rapidly adopting cloud-based computing solutions. This paper evaluates the impact of cloud technology adoption on the cost reduction for businesses.

Cloud computing advantages need to be looked at beyond purely savings in capital investment towards hardware, network and maintenance cost associate with growing business needs and IT expansion; since there are several other benefits could be achieved by cloud computing. For instance, some of the tangible and in-tangible benefits of cloud adoptions are-

Tangible

- Direct savings through reduction in capital investment (hardware, network, storage) shift from dedicated to pay per use model
- Cost associated with reliability/ availability for self-owned assets (bundles HA/DR solutions by public cloud providers)
- Cost to maintain self-owned infrastructure, space and eco-system to manage the assets
- Faster access and ability to adopt new technologies - Shift to PaaS model enables organizations to leverage latest and greatest technology evolution at no additional cost with the eco-system evolving – AI/ ML, edge computing, CV solutions maturing on cloud etc.

Intangible

- Shift to a SaaS model enables access to latest software capability and leverage industry best practices, with elimination of ownership associated with managing/ maintaining the product
- Adoption of Industry standards / best practices for non-core business functions (Corporate, administration, HR etc.) and reduce cost of ownership
- Improved customer service through agility in IT capability to support business
- Resilience and flexibility to organizations given the recent pandemic provides organizations scale to work from anywhere and ensure business reliability at all times

There are multiple ways organizations are adopting cloud journey through public/private/hybrid cloud adoptions. The cloud journey is continuous this also involves alleviating organization capability and talent to support the new technology. Typical stages for cloud adoptions and organization should embark on:

- **Pilot/ Evaluate**: pilot / experiment, identify target cloud strategy
- **Foundation:** Define structure/organization to support, establish governance, processes and foundation/ reference architecture
- **Plan**: Assess landscape and segment portfolio against cloud adoption through PAAS, IAAS and SAAS depending on the PACE layer architecture – the business value that a system derives, criticality and future roadmap.
- **Migrate or Transform**: Higher the business value and future potential greater the need to modernize to leverage future of technology and non-core business functions with stable demand yet business enabling (corporate - HR, Finance etc.) potential to move towards a SAAS model. Assess infrastructure to migrate/transform infrastructure solutions to more cost effective/ modernize solutions (containerization) etc.
- **Operate**: Managing cloud operations, optimize consumptions and drive efficiency in model

Based on the studies reviewed, it is determined that the acceleration of adoption of cloud-based services by businesses is due to using the cloud to deliver all required functions and add-ons to their users' as well as customers. It is studied that many firms are anticipating higher costs and greater obstacles to the adoption of cloud computing but the fundamental advantages of cloud computing are accessible to businesses of every size. Therefore, the study analysis reveals that the main promise which cloud computing technology offers to the business organization is to deliver all the functionalities of existing services by reducing the costs and facilitating cutting-edge business services. This also enhances the financial performance. Based on the analysis, it can be stated that by adopting cloud computing even smaller business firms can benefit from compute-intensive business analytics that were earlier accessible to large business organizations. For availing the benefits of cost reduction through cloud computing adoption, businesses are required to evaluate the economical processes of the organization and define their economic objectives.

V. Research Gap

According to the prior studies reviewed in this paper, the main attractiveness of adopting cloud computing technology comes from its cost effectiveness and more concisely cost savings. Cloud computing facilitates a flexible cost model that enables the organizations to invest just for the time and scale that is actually used by them instead of investing for those computing resources that are never used. Further cost benefits explained in prior research studies are the cost savings related to hardware, software, network and infrastructure. However, it is also identified that less efforts are exerted at critically examining the actual cost benefits of cloud computing adoption in terms of profits margins or actual cost reduction from operational point of view. All the studies are emphasizing the cost minimization and related models, diverse kinds of cost reductions but absolute operating cost reduction calculation is missing. Thus, organizations are required to carefully assess their end state objectives and identify whether the adaptation of cloud technologies will help them get there where they are focussing in the market with excellence while adhering to time and budget constraints. Organizations perceive digital technologies as compelling to lower lead times and maximize profit margins and estimation of cost reduction reflecting increase in profit will relate better. Exploration of the financial metrics and their interpretation would be helpful. Different studies have highlighted the impact of cloud computing technology on organizational performance but not much information and knowledge is shared regarding the cost factor of financial performance.

VI. Conclusion

The comprehensive utilization of digital transformation in the business sector is among the most significant elements for advancements. Digital transformation based on emerging digital technologies leads to reduction in transaction costs, increased access to market information, improved communication within the value chain and eventually accomplishing business excellence. With constant progression of the Internet, cloud computing has appeared as a corporate emerging information innovation. With the prevalent analysis on cloud computing everywhere, there has been a concern on estimating its actual efficacy. Even though the technology provides quick and convenient access to the required computing resources through web connection, it also reduces the issues such as scalability, providing resources and flexibility besides the cost savings. It is perceived and believed that cloud computing leads to greater efficiency and lower costs, however others consider it little more than upfront expenditures and operational headaches. However, the current paper has highlighted that even though there are some apprehensions related to cloud computing, cloud computing is the most cost effective, time-saving business technology solution available for business organizations of all sizes and scales. Cloud computing can reduce the cost through reduced administration and infrastructure cost and improved utilization. Digital transformation based on cloud computing can be the vehicle through which business operations can be transformed and long-term financial benefits can be stimulated for business firms. Cloud computing offers a means by which businesses can

achieve a faster return-on-investment and reduce costs in the long-term. This paper potentially contributes to the existing literature by describing the advantages of using cloud computing technology to simply manage the technology part of a business with cost reduction and availing benefits of better financial performance by focussing the complete attention and resources on core business activities.

Different organizations have realized the cost reductions driven by cloud technology but still there is less information on actual cost reduction calculation for organizations and this raises the need to explore more deeply the impact of cloud computing on organizations from the business cost perspective. Cloud computing evaluation with financial metrics allows organizations to make proper decisions on the use of clouds. Every organization has to calculate the essential parameters, assess the impacts on the level of optimization and ease of implementation and then they can make their cost optimization decisions. Therefore, it is suggested that further research should be attempted for better understanding of the cost factor, its reduction and effects on profits margins and other financial considerations in the cloud computing market.

References

1. Ali, S. M. (2019). Digital Transformation Framework: Excellence Of Things (EoT) for Business Excellence.
2. Aljabre, A. (2012). Cloud computing for increased business value. *International Journal of Business and social science*, *3*(1).
3. Attaran, M., & Woods, J. (2019). Cloud computing technology: improving small business performance using the Internet. *Journal of Small Business & Entrepreneurship*, *31*(6), 495-519.
4. Bandyopadhyay, P. K., & Nair, S. (2015). Impact of Business Excellence Model on Firm's Business Results (Findings from Literature Survey and Research Agenda). *International Journal of Economy, Management and Social Sciences*, *4*(2), 233-236.
5. Berman, S., & Marshall, A. (2014). The next digital transformation: from an individual-centered to an everyone-to-everyone economy. *Strategy & Leadership*.
6. Bharadwaj, A., El Sawy, O. A., Pavlou, P. A., & Venkatraman, N. (2013). Digital business strategy: toward a next generation of insights. *MIS quarterly*, 471-482.
7. Bican, P. M., & Brem, A. (2020). Digital Business Model, Digital Transformation, Digital Entrepreneurship: Is There A Sustainable "Digital"?. *Sustainability*, *12*(13), 5239.
8. Bongiorno, G., Rizzo, D., & Vaia, G. (2018). CIOs and the digital transformation: A new leadership role. In *CIOs and the digital transformation* (pp. 1-9). Springer, Cham.
9. Chang, I. C., Liu, C. C., & Guo, B. R. (2014). The financial performance of cloud computing. *Asian Economic and Financial Review*, *4*(5), 651-654.
10. Chen, T., Chuang, T. T., & Nakatani, K. (2016). The perceived business benefit of cloud computing: An exploratory study. *Journal of International Technology and Information Management*, *25*(4), 7.
11. Choudhary, S. K., Jadoun, R. S., Mandoria, H. L., & Kumar, A. (2014). Latest development of cloud computing technology, characteristics, challenge, services & applications. *IOSR Journal of Computer Engineering*, *16*(6), 57-68.
12. Etro, F. (2009). The economic impact of cloud computing on business creation, employment and output in Europe. *Review of Business and Economics*, *54*(2), 179-208.
13. Gartner Inc. (2018). Gartner IT Glossary
14. Ghalimi, I. C. (2010). Benefits of cloud computing. *An Intalio White Paper, Palo Alto, CA, Intalio, Inc. Last retrieved on December*, *1*, 2016.
15. Gibe, J., & Kalling, T. (2019). *Business Models and Strategy*. Studentlitteratur.
16. Gill, A., Bunker, D., & Seltsikas, P. (2015). Moving forward: emerging themes in financial services technologies' adoption. *Communications of the Association for Information Systems*, *36*(1), 12.
17. Goldfarb, A., & Tucker, C. (2019). Digital economics. *Journal of Economic Literature*, *57*(1), 3-43.
18. Ivančić, L., Vukšić, V. B., & Spremić, M. (2019). Mastering the digital transformation process: business practices and lessons learned. *Technology Innovation Management Review*, *9*(2).
19. Jankalová, M., & Jankal, R. (2020). How to Characterize Business Excellence and Determine the Relation between Business Excellence and Sustainability. *Sustainability*, *12*(15), 6198.
20. Kalaskar, K., Yadav, S., & Dhumane, P. (2019). *Advance Model For Cost Reduction In Cloud Computing Environment*. Retrieved from website: http://www.ijstr.org/final-print/nov2019/Advance-Model-For-Cost-Reduction-In-Cloud-Computing-Environment.pdf
21. Khan, H., & Jiong, Y. (2019). Cloud Computing Effect on Enterprises in Terms of Cost. *International Journal of Computer Trends and Technology*, *67*(5), 14–19. https://doi.org/10.14445/22312803/ijctt-v67i5p103
22. Kurmann, P., & Arpe, B. (2019). Managing Digital Transformation-How organizations turn digital transformation into business practices.

23. Laudon, C. K., & Laudon, P. J. (2013). Essentials of management information systems.
24. Li, F. (2015, January). Digital technologies and the changing business models in creative industries. In 2015 48th Hawaii International Conference on System Sciences (pp. 1265-1274). IEEE.
25. Lucas Jr, H., Agarwal, R., Clemons, E. K., El Sawy, O. A., & Weber, B. (2013). Impactful research on transformational information technology: An opportunity to inform new audiences. *Mis Quarterly*, 371-382.
26. Mann, R., Mohammad, M., & Agustin, T. (2012). Understanding Business Excellence–An Awareness Guide for SMEs.
27. Markides, C., & Sosa, L. (2013). Pioneering and first mover advantages: the importance of business models. *Long Range Planning*, *46*(4-5), 325-334.
28. Mirrazavi, S., & Khoorasgani, G. H. (2016). The impact of cloud computing technology on organizational performance; financial, customer, operational (Case Study: Zarin Iran Porcelain Industries Co.). *Mediterranean Journal of Social Sciences*, *7*(4 S1), 279.
29. Mohammad, M., Mann, R., Grigg, N., & Wagner, J. P. (2011). Business Excellence Model: An overarching framework for managing and aligning multiple organisational improvement initiatives. *Total Quality Management & Business Excellence*, *22*(11), 1213-1236.
30. Ongori, H., & Migiro, S. O. (2010). Information and communication technologies adoption in SMEs: literature review. *Journal of Chinese Entrepreneurship*.
31. Ostojić Mihić, A., Umihanić, B., & Fazlović, S. (2015). The role of organizational innovation in achieving and maintaining company's business excellence. *Management: journal of contemporary management issues*, *20*(1), 79-100.
32. Piccinini, E., Gregory, R. W., & Kolbe, L. M. (2015). Changes in the producer-consumer relationship-towards digital transformation. *Changes*, *3*(4), 1634-1648.
33. Popović-Pantić, S., Semenčenko, D., & Vasilić, N. (2020). Digital technologies and the financial performance of female SMES in Serbia: The mediating role of innovation. *Economic Annals*, *65*(224), 53-81.
34. Pozega, Z., Crnkovic, B., & Udovicic, A. (2014). Business excellence as a crucial component for organization competitiveness. *UTMS Journal of Economics*, *5*(2), 179-188.
35. Priyono, A., Moin, A., & Putri, V. N. A. O. (2020). Identifying Digital Transformation Paths in the Business Model of SMEs during the COVID-19 Pandemic. *Journal of Open Innovation: Technology, Market, and Complexity*, *6*(4), 104.
36. Schwertner, K. (2017). Digital transformation of business. *Trakia Journal of Sciences*, *15*(1), 388-393.
37. Sopia, S. M. O., Ogalo, J., & Kurgatt, K. (2016) Effect of Cloud Computing Environment on Total Cost of Ownership; a Case of Internet Service Providers (Safaricom and Access Kenya).
38. Talwar, B. (2011). Business excellence models and the path ahead…. *The TQM Journal*.
39. Tolboom, I. H. (2016). The impact of digital transformation.
40. Vartiak, L., & Jankalova, M. (2017). The business excellence assessment. *Procedia engineering*, *192*, 917-922.
41. Weintraub, E., & Cohen, Y. (2015). Cost optimization of cloud computing services in a networked environment. *International Journal of Advanced Computer Science and Applications*, *6*(4), 148-157.
42. Westerman, G., Calméjane, C., Bonnet, D., Ferraris, P., & McAfee, A. (2011). Digital Transformation: A roadmap for billion-dollar organizations. *MIT Center for digital business and capgemini consulting*, *1*, 1-68.
43. Widyastuti, D., & Irwansyah, I. (2018). Benefits and challenges of cloud computing technology adoption in small and medium enterprises (SMEs). *Bandung Creative Movement (BCM) Journal*, *4*(1).
44. Yang, H., & Tate, M. (2012). A descriptive literature review and classification of cloud computing research. *Communications of the Association for Information Systems*, *31*(1), 2.