

THE ROLE OF INFORMATION TECHNOLOGY IN INFLUENCING DIGITALIZATION OF CONTEMPORARY BUSINESSES. A CONCEPTUAL REVIEW OF LITERATURE

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DOI: [10.5281/zenodo.6553360](https://doi.org/10.5281/zenodo.6553360)

Abstract

The present research has presented opportunities for incorporating information technology for digitally transforming the contemporary businesses since the changes accompanying applications of information technology are prevailing in all facets of modern-day businesses. The comprehensive conceptual review of literature regarding significance of information technology in management has revealed that present-day businesses have been concentrating on incorporating contemporary information technologies, for instance analytics, mobile, social, cloud computing and big data, in order to transmute and accelerate their business processes. The capability for digitally re-imagining the strategic management of contemporary business processes is primarily determined by means of an evident digital strategy which is supported by the managers and the leaders who advocate an organizational culture competent enough to change the present culture. There is tremendous potential for information technology within the context of strategic management in contemporary businesses because recent studies have identified that risk taking is now being regarded as a cultural norm and an effective approach for gaining greater competitive advantage. The organizations where information technology components, such as social and mobile technologies, cloud computing and big data are integral parts of strategic management processes are generating greater revenues, making more profits and accomplishing superior market valuations as compared to companies deprived of this strong vision. Nevertheless, some critical challenges are also associated with incorporating several facets of this emerging information technology in contemporary businesses which include data security concerns, lack of control and interoperability issues with existing information technology systems. The managerial implications and directions for future research have been discussed as well.

Keywords: Information technology, contemporary businesses, strategic management, analytics, big data

Introduction

The emergence of information technology has resulted in digitalization of contemporary businesses in all industries across the globe as it has managed to break down barriers among individuals, businesses and things. Consequently, modern businesses are capable to explore more efficient manners to do business by creating new products and services. Moreover, it is noteworthy to consider that the innovative measures of incorporating information technology in strategic management processes of contemporary businesses are taking place in all types of organization and in all industries (Haseeb et al., 2019). However, a common theme is shared by all these innovative measures and that is capability of transforming business models and processes, empowering efficiency of workforce and personalizing and customizing the consumer experiences (Warner & Wäger, 2019). For this purpose, businesses are in exigent need of digital business platform which is not only enabled by information technology but is also outcome driven. Lack of relevant studies providing a holistic overview of significance, opportunities and challenges pertaining to information technology adoption for better performance of contemporary businesses in one of the reasons numerous contemporary businesses not be able to understand the importance of information technology and not being able to incorporate its facets into their strategic management processes.

Digital Business Transformation can be perceived as an important application of information technology for constructing innovative business models, systems, software and processes which yield in higher efficiency, superior competitive advantage and lucrative revenue. Modern-day businesses are realizing the significance of information technology in order to transform their business models and processes, empower innovation and workforce efficiency, and personalize the customer experiences (Chege, Wang, & Suntu, 2020). It has been empirically validated in recent studies that the contemporary businesses in which components of information technology, such as social and mobile technologies, cloud computing and big data are fundamental parts of strategic management processes are generating bigger revenues, making additional profits while achieving greater market valuations as compared to their competitors who do not value this robust vision (Grover et al., 2018; Mikalef et al., 2018; Lnenicka & Komarkova, 2019).

However, it is also significant to mention that there are quite a few challenges which are faced by contemporary businesses as they attempt to incorporate critical facets of information technology for enhancing effectiveness and efficiency of their managerial processes. Therefore, the present study has analyzed benefits, opportunities and challenges regarding adoption of information technology facets in strategic management processes by contemporary businesses. The digital business transformation is indeed a novel phenomenon and most of the contemporary businesses are yet to reach last state of digital maturity although there are

conclusive evidences of readiness to adopt novel information technology facets by these organizations. Some recent studies have elaborated the need to conduct research to understand opportunities and challenges faced by business firms when they plan to incorporate information technology within their managerial processes (Rodríguez, 2020; Jewell, Jewell, & Kaufman, 2020). The present research is significant for research scholar as well as contemporary business executives because it has focused on the conceptual review of literature about incorporation of information technology particularly within managerial processes of contemporary businesses, and this is something very rarely executed by previous studies.

Putting Business Strategy ahead of Information Technology

In the contemporary world, businesses and most of human activities are being actively influenced by components of information technology such as analytics, social and mobile technologies and cloud computing. Present-day businesses can consider and integrate the elements of information technology with all their capabilities for transforming managerial processes, engaging useful talent as well as driving novel business models for surviving and competing in the environment of ever-rising competition (Di Vaio et al., 2020). Benn, Edwards and Williams (2014) elaborated that organizational change takes place when a transition is made by the firm from its present state to an anticipated or desired state where the firm wants to see itself in future. Moreover, the process of managing the organizational change involves planning for the change and implementing the change in a manner which results in maximum effectiveness while minimizing the cost and employee resistance towards that specific change effort (Hornstein, 2015). Similarly, digital business transformation can be perceived as integrating components of information technology into different aspects of business which results in major modification in the present manners of organizational operations. Chanias, Myers and Hess (2019) clarified that during digital transformation process, incorporating as many facets of information technology as possible is not enough and the business strategy is vital in this regard as well.

Business strategy is something which is moving, it is having a prominent vision directed towards development of the firm and eventually it has to be supported by critical components of novel information technology which are relevant and closely linked with the favored strategy. Efficacious digital transformation has simultaneous integration of optimization and reengineering of business processes in the desired manner which is apposite for strategy formulation and execution (Yin et al., 2015). It is noteworthy to understand that it is not possible to formulate and execute one strategy for digital transformations which fits into all businesses and all industries. A single platform is required for connecting all functional units within the same organization and it is evident that in absence of only one platform, it is impossible to achieve digital transformation. Seamless interaction with consumers at all

business touch points should be the ultimate goal of the strategy. Few recent studies have revealed that businesses that have undergone digital transformation are yielding at least 26% more profits as compared to their competitors who have opted to pursue with traditional approach (Möller, Nenonen, & Storbacka, 2020).

Focusing on strategy is important because in absence of an effective business strategy, contemporary businesses would be focusing more on technology and not on their customers. Essentially, organizational change, the integration of data and the technology must be addressed equally for achieving success in the digital transformation process of contemporary businesses (Vial, 2019). Leveraging culture, leadership and strategy is important for businesses for harnessing digital transformation potential. The ideal goals for digital strategy of contemporary businesses include transforming the business, improving decision making, improving innovation, increasing efficiency and improving consumer experience (Attaran, Attaran, & Kirkland, 2019). The innovation level of the present-day businesses has to be superior as compared to their competitors in the same industry. Moreover, effective and competent leadership having sufficient skills and experience is necessary for leading the digital strategy (Olofsson, Fransson, & Lindberg, 2020). Therefore, a well-founded strategy as well as capable leadership can be regarded as important determinants of successful business transformation. Furthermore, transformational changes are also essential for implementing digital transformation and these changes are closely associated with culture, leadership and strategy as discussed earlier.

Some contemporary studies in information technology and business management domain have concluded that successful contemporary businesses formulate and execute a pre-defined strategy, motivate senior, middle and lower level management to adopt to change, encourage involvement of employees in the digital transformation process and focus on the changes in consumer interests and needs. Kotarba (2018) suggested approaches to understand digital transformation process for contemporary businesses can be grouped into some prominent areas which include business models, business processes and consumer behavior. This essentially means that incorporating elements of information technology to manage modern day businesses can result in more chances of gaining customer loyalty. Furthermore, the digital transformation process also results in automation of research and development, production processes and the distribution processes. Focusing specifically on the managerial aspects of contemporary businesses, information technology enables workforce at all managerial levels and in several functional areas within the firm to perform their task effectively and efficiently (Tallon et al, 2019). The decision making of senior management of an organization is facilitated through different components of information technology.

The process of transforming business models is executed by means of introducing novel business solutions which is done through incorporation of critical elements of information technology. More contemporary business are getting benefited from the services of knowledge workers who are digitally connected, prefer mobility and adaptable to become essential part of massive digital communities (Jarrahi & Thomson, 2017). These particular characteristics which are closely associated with strategy element of the business model essentially mean that digital business transformation can be perceived as set of some specific features which include: overall business model, organizational structure, employees digital skill set level, extent to which the business processes are digitalized, information technology infrastructure, extent to which the products and services offered by the business are digitalized, and finally the digital communication channels adopted by the organization (Gomber et al., 2018). Moreover, the swift changes in digital environments require shortening the time required for strategic planning and restraining operations to annual planning, managing existing carefully, restructuring continuous change and making possibilities for decentralized management (Gomber et al., 2018).

Analyzing Information Technology in Contemporary Manufacturing Businesses

There are quite a few sectors where information technology plays an integral role in the entire production processes. An evident example of this can be observed in the manufacturing businesses where incorporating elements of information technology into processes of testing and developing new products leads to precision, accuracy and cost effectiveness. The management teams of manufacturing businesses are more inclined towards utilizing mobile application in order to improve internal communication among the employees and the overall production processes. Here, using information technology elements to interact with the end-users, i.e. final consumers of product, is not given much consideration (Francisco & Swanson, 2018). The critical elements of information technology are utilized to accelerate information processing and managing large databases and they are more focused towards the production. Additionally, when managerial practices are accompanied by novel facets of information technology, this opens up potential for globalization or internationalization for the manufacturing businesses (Rana, Saikia, & Barai, 2018). Therefore, information technology provides prospects of growth and expansion for the manufacturing businesses particularly in traditional economic sectors.

Manufacturing industry's customary value chain of the OEMs (original equipment manufacturers), the suppliers and retailers as well as the aftermarket has been interrupted by newfangled, digitally incisive players in existing as well as extended value chain (Pla-Barber & Villar, 2019). Novel and innovative information technology facets have impelled business model modernizations which have resulted in extension of standard value chain of

contemporary manufacturing businesses. Another aspect of information technology in manufacturing businesses is that it has resulted in formation of new segments as numerous new entrants with growing relevance are populating this industry. The pace at which this rapid transformation is taking place is due to advancements in information technology, emergence of novel business models, changing environmental trends and consumer behavior and the regulatory practices (Lang & Mohnen, 2019). Most of the times, this impact is visible in the way management practices are executed within the manufacturing businesses and in aftersales phase of value chain.

Information technology is playing imperative role in transformation of manufacturing businesses as it is having a direct influence over research and development, the procurement and assembly processes and the marketing and sales as well. It has been projected that by 2025, more than 15% of global revenues generated by manufacturing businesses will be online and China is expected to be most appropriate market to attract massive revenue growth as a consequence of digital transformation of contemporary manufacturing businesses (Ganichev, & Koshovets, 2019). However, the challenges faced by this sector as it proceeds towards digital transformation include data privacy and security concerns of employees and consumers. The capability for managing and securing digital information of employees and consumers is indeed a massive concern faced by contemporary businesses (Vial, 2019).

Digital transformation entails a comprehensive scrutiny of existing business model and state of business processes within the firm. An in-depth analysis is required for developing an effective digital transformation strategy and this analysis must be able to address some distinctive areas such as digital transformation attitude which involves how to manage support for the digital business strategy, how to facilitate the management for effective use of information technology, how digital communication channels are going to be used, how digital infrastructure will be maintained, how digital tools will be utilized to execute managerial processes and facilitate customers, how investments into providing digital solutions will be managed and how resources will be allocated for digital transformation processes (Priyono, Moin, & Putri, 2020). It is also important that this analysis must concentrate on few key aspects such as organizational leadership and management, investors, partners and suppliers and the end users. The analysis should be able to draw elaborative conclusion about digitalization strategy of the business for creating more customer value, helping investor relations, enhancing interaction with partners, changing corporate culture and effectively changing processes for digital transformation (Matarazzo et al., 2020). It has also been identified from the conceptual review analysis that digital transformation further involves providing high quality services to the management team through mobile applications and cloud services.

Incorporating Information Technology Elements for Optimum Digital Business Transformation

There are quite a few prominent aspects of information technology which assist in achieving optimum digital transformation for contemporary businesses as identified by some recent studies in the relevant domain (Mariani & Wamba, 2020). Some of the most feasible and effective options have been elaborated in this section.

Cloud Computing is a framework which enables on-demand and convenient network access to collectively pooled configurable computing resources (for example, applications, storage, services, servers and networks) which can be swiftly provisioned and released while requiring least efforts from the management or minimal interaction with the service provider. Cloud computing framework endorses availability and it comprises of 5 indispensable characteristics which include measured service, rapid elasticity, resource pooling, broad network access and on-demand self-service (ref). It also incorporates 3 service models which include IaaS (Infrastructure as a Service), Paas (Platform as a Service) and SaaS (Software as a Service) (Zhong et al., 2017). Furthermore, the cloud computing framework also encompasses 4 deployment models which include Hybrid cloud, Public cloud, Community cloud and Private cloud. Moreover, the fundamental empowering technologies include high-quality and efficient virtualization for commodity hardware, inexpensive yet powerful server computers and speedy wide-area networks (García-Valls, Dubey, & Botti, 2018).

Cloud computing is indeed a novel facet of information technology for contemporary businesses. It is evident that businesses these days are increasingly relying on cloud computing frameworks in all vertical markets as well as in all organizational sizes. Hassan et al. (2017) have anticipated that larger organizations (with 250 employees or more) would continue to spend more in order to advance their cloud computing framework as compared to SMEs (small and medium enterprises), despite the fact that they are already accounting for more than 80% of investment in cloud computing advancement across the globe. Considering SMEs only, the larger SMEs (having 100-249 employees) would increase their investment to enhance cloud computing framework as compared to the smaller SMEs. Contemporary businesses have recognized the tangible economic benefits associated with adoption of latest cloud computing models and are increasing their investments for this purpose.

Some very common benefits derived from cloud computing include reduction of efforts of the managerial staff and incurring less expenses to execute managerial processes. The most important advantages gained by contemporary businesses by incorporating the cloud computing element of information technology include:

- **Foreseeable Expenses:** Generally, the cloud computing service costs are paid on usage basis or monthly basis and there is either no or very marginal upfront expense. This indicates that there is no need to incur any extensive preliminary capital investment as this service or technology can be purchased and maintained through existing operating expenses.
- **Fewer Total Costs:** The total operation expenses incurred due to managerial and other functional activities within the organization are reduced to a great extent by using cloud computing element and this can be related to economies of scale conceptualization of economic that every service provider desires to achieve.
- **Access to Outstanding Technology:** Cloud computing frameworks help contemporary firms to get access to and make use of the finest and outstanding information technology facets and that too without making massive initial investment.
- **Costs as per Usage:** an interesting advantage of using cloud computing is that firms do not have to pay for maximum use limit, rather they are charged for the actual usage.

It is evident that contemporary businesses in public as well as private sectors are rapidly adopting cloud computing frameworks and it is still growing as benefits of cloud computing are significant for clients and businesses.

- For clients who have not used cloud computing, the ease of use and cost effectiveness are the main attractions related to this facet. For clients who already have exposure to this technology, flexibility, agility and efficacy are the major attractions to continue using cloud computing models.
- For contemporary businesses, the benefits of using cloud computing include higher productivity, effective mobile networking, increased capabilities to expand operations in other geographical locations and entering new business areas.

The last few years have observed extremely rapid development of cloud computing frameworks which makes it evident that it is going to be an optimal resource efficiency instrument in years to come. Further, it is anticipated the broad focus is going to be on service management and security. The available information indicates that more than 53% of medium and large businesses worldwide are using some form of cloud computing and it is projected that this number is going to increase by more than 85% by the year 2025 (Asch et al., 2018).

Another related information technology aspect, IoT (Internet of Things) which is explained as internetworking of physical devices, vehicles ("smart devices" and "connected devices"), buildings as well as other objects entrenched with network connectivity, actuators, sensors, software and electronics to enable collection and exchange of data, is also significant for optimal performance of contemporary businesses (Bellavista et al., 2020). The internet of

things is so important that in 2013, the Global Standards Initiative termed it as “the infrastructure of the information society” (Kao et al., 2017). The Internet of things permits items to be detected or controlled distantly from corner to corner of present network infrastructure, generating prospects for additional direct assimilation of physical world into computer-based systems, then causing value-added effectiveness, accurateness as well as economic advantage in addition to reduced human involvement. Similarly, the Cloud IoT service has been incorporated in information systems of numerous contemporary businesses (Meri et al., 2019).

Mobile Technology can also be referred to as an integral component of information technology which is essential for digital transformation for contemporary businesses.

- Mobile technologies have the capability to recognize the aim behind digital transformation and they are able to provide unified and smooth interaction at all business touch points with the managerial staff and the consumers.
- Mobile digital business platform growth is primarily dependent upon tablets and smartphones.
- Contemporary global economy and business transforming society are actively engage to make progression towards enhanced mobility as well as digital collaboration.
- Productivity can be seen as one major advantage of mobile technology as contemporary businesses using up to date mobile technologies for their management and business operations are observed to be 26% more profitable than other businesses that have not focused on upgradation of their mobile technologies (Mwantimwa, 2019).

The incorporation of mobile technologies in contemporary businesses and the present integration level among technologies is resultant of primary focus on ideal management of business processes and overall needs of the business.

Data Analysis and Significance of Big Data – The business data volume for modern day firms is increasing rapidly (terabytes and even petabytes of data) which reflects on the fact that managing and analyzing massive quantity of information is nothing short of a challenge (Khattak et al., 2019). Not surprisingly, managing single homogenous workloads is not efficient any more for the data warehouses.

- Assembling data resources within cloud framework permits more flexibility and more rapid innovation for robust business demands. It is safe to say that cloud computing has indeed transformed parameters which have applied restrictions regarding traditional relational database since it provides virtualization, dynamic resource allocation, as well as vivid economies of scale in order to manage enormous quantities of data.

- Business Intelligence tools also play a prominent role in this regard. For big data, Google Big Query web service is commonly adopted and for relational database, Google CloudSQL is a cost effective option.

Some recent studies have figured out that although, a large number of contemporary businesses are incorporating several facets of information technology to upgrade their managerial and overall business operations, still only a small percentage of these businesses are using information technology to analyze large quantity of data which elaborates on the potential of adoption of big data and data analytics by contemporary businesses (Xiang et al., 2017). Mora et al. (2018) argued that almost 47% of contemporary businesses are using geo location data through mobile devices as primary source of analysis, almost 45% are focusing on data generated by means of social media platforms, almost 33% are using sensors and smart devices of analyzing their own data in large quantities while almost 25% are making use of some particular “other sources” for data analysis. Another research focusing on European Union members concluded that more than 15% contemporary businesses in European Union are making use of information technology facets to analyze large data with Netherlands depicting highest and Cyprus showing least focus towards big data and data analysis (Bohnsack, Ciulli, & Kolk, 2020).

Information Technology Leading SMEs towards Digital Business Transformation

French, Risius, and Shim (2020) elaborated that small and medium enterprises, all around the world, are increasingly identifying the significance of information technology and actively incorporating up to date IT facets within their managerial and overall business processes for the purpose of swift digital business transformation. The subject matter of digitization and transformation of the business model is critical in order to gain competitive advantage while maintaining value of local as well as worldwide marketplace for all contemporary businesses. It is also imperative to understand that owners, managers and all other levels of hierarchy have direct involvement in the digital transformation process of SMEs. This also makes it evident that modern day managers of contemporary SMEs are aware of the significance of the role performed by digital business transformation.

However, the major obstacles and challenges regarding digitalization of contemporary businesses are not confined to technologies. In fact, there are several factors that play key role in this regard which include: lack of motivation and risk taking, scarcity of adequate resources, dearth of efficient practices and relevant knowledge, resistance of employees towards change, cultural traditions and more importantly, the human factor (Mahmutaj, Ramosaj, & Krasniqi, 2019). Quite a few scholars and practitioners in the domain of management and information technology have forecasted a very strong and significant impact of digital transformation of

contemporary businesses over their growth, prosperity and innovation (Litvinenko, 2020). The digital transformation process is very comprehensive and it involves social networks, big data, large data analysis, cloud computing frameworks, and mobile applications and devices. Möller, Nenonen, and Storbacka (2020) have predicted that by the year 2025, information and communication technology will surpass the market worth of \$10 trillion, which was mere \$1.3 trillion in the year 2012, where digital transformation technologies would be accounting for 98% growth and more than 40% of revenues, which at present are approximately 22% of the information technology spending.

Conclusion, Implications and Directions for Future Research

Contemporary businesses are actively seeking positive and growth oriented business environment where corporate flexibility is not negatively affected. Considering the modern day global business environment in particular, the key success factor for firms is effective and swift adoption towards change. Digital business transformation is definitely an objective process which effectively answers back the call for changing business environment. Importantly, the managerial staff and employees of the organization must support the incorporation of information technology for smooth execution of managerial operations. Furthermore, the precise strategy must be backed up by financial resources and supported by the leadership. It is also important to acknowledge that the pace of flow is largely dependent upon the sector in which the business is operating. Indeed, prompt development in universal connectivity is the recent trend. The global economy is transforming into digital economy with a propagation of mobility and broadband connectivity, big data and analytics, use of smart sensors, e-commerce, cloud computing, social media and Internet of Things.

At this time the strategic technologies which may expressively influence the contemporary businesses for upcoming years, are shaped primarily by four convergent forces i.e. data analytics, cloud computing, mobile devices and social networks. These facets are revolutionary as well as innovative within themselves, however in combination, they profoundly transform business and overall society, rescinding timeworn business models while producing fresh leaders. Connection of these forces can build a sturdy underpinning for digital transformation podiums. Despite all the challenges associated with incorporation of information technology to enhance performance of management and overall business operations, it is in benefit of the contemporary business to adopt and make optimal use of the information technology facets. Future researchers can carry out empirical studies to identify the influence of information technology in management and operations within contemporary businesses. Further, the future studies can limit themselves to a particular industry, for instance, fast moving consumer goods, and study the impact of information technology on management and operations of contemporary businesses.

References

- Asch, M., Moore, T., Badia, R., Beck, M., Beckman, P., Bidot, T., ... & Zacharov, I. (2018). Big data and extreme-scale computing: Pathways to convergence-toward a shaping strategy for a future software and data ecosystem for scientific inquiry. *The International Journal of High Performance Computing Applications*, 32(4), 435-479.
- Attaran, M., Attaran, S., & Kirkland, D. (2019). The need for digital workplace: increasing workforce productivity in the information age. *International Journal of Enterprise Information Systems (IJEIS)*, 15(1), 1-23.
- Bellavista, P., Berrocal, J., Corradi, A., Das, S. K., Foschini, L., Al Jawarneh, I. M., & Zanni, A. (2020). How Fog Computing Can Support Latency/Reliability-sensitive IoT Applications: An Overview and a Taxonomy of State-of-the-art Solutions. *Fog Computing: Theory and Practice*, 139-213.
- Benn, S., Edwards, M., & Williams, T. (2014). *Organizational change for corporate sustainability*. Routledge.
- Bohnsack, R., Ciulli, F., & Kolk, A. (2020). The role of business models in firm internationalization: An exploration of European electricity firms in the context of the energy transition. *Journal of International Business Studies*, 1-29.
- Chanias, S., Myers, M. D., & Hess, T. (2019). Digital transformation strategy making in pre-digital organizations: The case of a financial services provider. *The Journal of Strategic Information Systems*, 28(1), 17-33.
- Chege, S. M., Wang, D., & Suntu, S. L. (2020). Impact of information technology innovation on firm performance in Kenya. *Information Technology for Development*, 26(2), 316-345.
- Di Vaio, A., Palladino, R., Hassan, R., & Escobar, O. (2020). Artificial intelligence and business models in the sustainable development goals perspective: A systematic literature review. *Journal of Business Research*, 121, 283-314.
- Francisco, K., & Swanson, D. (2018). The supply chain has no clothes: Technology adoption of blockchain for supply chain transparency. *Logistics*, 2(1), 2-20.
- French, A. M., Risius, M., & Shim, J. P. (2020). The Interaction of Virtual Reality, Blockchain, and 5G New Radio: Disrupting Business and Society. *Communications of the Association for Information Systems*, 46(1), 25.
- Ganichev, N. A., & Koshovets, O. B. (2019). Integrating Russia into the Global Project of Digital Transformation: Opportunities, Problems and Risks. *Studies on Russian Economic Development*, 30(6), 627-636.

- García-Valls, M., Dubey, A., & Botti, V. (2018). Introducing the new paradigm of social dispersed computing: applications, technologies and challenges. *Journal of Systems Architecture*, 91, 83-102.
- Gomber, P., Kauffman, R. J., Parker, C., & Weber, B. W. (2018). On the fintech revolution: Interpreting the forces of innovation, disruption, and transformation in financial services. *Journal of Management Information Systems*, 35(1), 220-265.
- Grover, V., Chiang, R. H., Liang, T. P., & Zhang, D. (2018). Creating strategic business value from big data analytics: A research framework. *Journal of Management Information Systems*, 35(2), 388-423.
- Haseeb, M., Hussain, H. I., Ślusarczyk, B., & Jermsittiparsert, K. (2019). Industry 4.0: A solution towards technology challenges of sustainable business performance. *Social Sciences*, 8(5), 154-168.
- Hassan, H., Nasir, M. H. M., Khairudin, N., & Adon, I. (2017). Factors influencing cloud computing adoption in small medium enterprises. *Journal of Information and Communication Technology*, 16(1), 21-41.
- Hornstein, H. A. (2015). The integration of project management and organizational change management is now a necessity. *International Journal of Project Management*, 33(2), 291-298.
- Jarrahi, M. H., & Thomson, L. (2017). The interplay between information practices and information context: The case of mobile knowledge workers. *Journal of the Association for Information Science and Technology*, 68(5), 1073-1089.
- Jewell, D. O., Jewell, S. F., & Kaufman, B. E. (2020). Designing and implementing high-performance work systems: Insights from consulting practice for academic researchers. *Human Resource Management Review*, Early View, 1–16.
- Kao, C. C., Lin, Y. S., Wu, G. D., & Huang, C. J. (2017). A comprehensive study on the internet of underwater things: applications, challenges, and channel models. *Sensors*, 17(7), 1477-1493.
- Khattak, B., Khan, A., Khan, K., Khan, W., Kamran, M., & Fahad, M. (2019). Empirical Analysis of Recent Advances, Characteristics and Challenges of Big Data. *EAI Endorsed Transactions on Scalable Information Systems*, 6(23), 1-18.
- Kotarba, M. (2018). Digital transformation of business models. *Foundations of Management*, 10(1), 123-142.
- Lang, L., & Mohnen, A. (2019). An organizational view on transport transitions involving new mobility concepts and changing customer behavior. *Environmental Innovation and Societal Transitions*, 31, 54-63.
- Litvinenko, V. S. (2020). Digital economy as a factor in the technological development of the mineral sector. *Natural Resources Research*, 29(3), 1521-1541.

- Lnenicka, M., & Komarkova, J. (2019). Developing a government enterprise architecture framework to support the requirements of big and open linked data with the use of cloud computing. *International Journal of Information Management*, 46, 124-141.
- Mahmutaj, L. R., Ramosaj, B., & Krasniqi, B. A. (2019). Exploring driving factors and challenges of innovation in service firms: evidence from Kosovo. *International Journal of Technological Learning, Innovation and Development*, 11(3), 215-244.
- Mariani, M. M., & Wamba, S. F. (2020). Exploring how consumer goods companies innovate in the digital age: The role of big data analytics companies. *Journal of Business Research*, 121, 338-352.
- Matarazzo, M., Penco, L., Profumo, G., & Quaglia, R. (2020). Digital transformation and customer value creation in Made in Italy SMEs: A dynamic capabilities perspective. *Journal of Business Research*, 123, 642-656.
- Meri, A., Hasan, M. K., Danaee, M., Jaber, M., Safei, N., Dauwed, M., ... & Al-bsheish, M. (2019). Modelling the utilization of cloud health information systems in the Iraqi public healthcare sector. *Telematics and Informatics*, 36, 132-146.
- Mikalef, P., Pappas, I. O., Krogstie, J., & Giannakos, M. (2018). Big data analytics capabilities: a systematic literature review and research agenda. *Information Systems and e-Business Management*, 16(3), 547-578.
- Möller, K., Nenonen, S., & Storbacka, K. (2020). Networks, ecosystems, fields, market systems? Making sense of the business environment. *Industrial Marketing Management*, 90, 380-399.
- Mora, H., Pérez-delHoyo, R., Paredes-Pérez, J. F., & Mollá-Sirvent, R. A. (2018). Analysis of social networking service data for smart urban planning. *Sustainability*, 10(12), 4732-4744.
- Mwantimwa, K. (2019). ICT usage to enhance firms' business processes in Tanzania. *Journal of Global Entrepreneurship Research*, 9(1), 46-66.
- Olofsson, A. D., Fransson, G., & Lindberg, J. O. (2020). A study of the use of digital technology and its conditions with a view to understanding what 'adequate digital competence' may mean in a national policy initiative. *Educational studies*, 46(6), 727-743.
- Pla-Barber, J., & Villar, C. (2019). Governance and competitiveness in global value chains: A comparative study in the automobile and textile industries. *Economics and Business Review*, 5(3), 72-91.
- 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), 104-125.

- Rana, S., Saikia, P. P., & Barai, M. K. (2018). Globalization and Indian manufacturing enterprises. *FIIB Business Review*, 7(3), 167-175.
- Rodríguez, R., Molina-Castillo, F. J., & Svensson, G. (2020). The mediating role of organizational complexity between enterprise resource planning and business model innovation. *Industrial Marketing Management*, 84, 328-341.
- Tallon, P. P., Queiroz, M., Coltman, T., & Sharma, R. (2019). Information technology and the search for organizational agility: A systematic review with future research possibilities. *The Journal of Strategic Information Systems*, 28(2), 218-237.
- Vial, G. (2019). Understanding digital transformation: A review and a research agenda. *The Journal of Strategic Information Systems*, 28(2), 118-144.
- Warner, K. S., & Wäger, M. (2019). Building dynamic capabilities for digital transformation: An ongoing process of strategic renewal. *Long Range Planning*, 52(3), 326-349.
- Xiang, Z., Du, Q., Ma, Y., & Fan, W. (2017). A comparative analysis of major online review platforms: Implications for social media analytics in hospitality and tourism. *Tourism Management*, 58, 51-65.
- Yin, Y. H., Nee, A. Y., Ong, S. K., Zhu, J. Y., Gu, P. H., & Chen, L. J. (2015). Automating design with intelligent human-machine integration. *CIRP Annals*, 64(2), 655-677.
- Zhong, R. Y., Xu, X., Klotz, E., & Newman, S. T. (2017). Intelligent manufacturing in the context of industry 4.0: a review. *Engineering*, 3(5), 616-630.