

# **Achieving Data Driven Decision-Making Quality Through Digital Leadership and Organizational Optimization.**

**Syed Shariq, Felicita Chromjaková, and Khalid Ahmed Attia Mohamed**

Faculty of Management and Economics

Department of Industrial Engineering and Information Systems

Tomas Bata University in Zlin, Czech Republic

[shariq@utb.cz](mailto:shariq@utb.cz), [chromjakova@utb.cz](mailto:chromjakova@utb.cz), [mohamed@utb.cz](mailto:mohamed@utb.cz)

## **Abstract**

Study purpose is to provide a mechanism for overcoming the barriers towards implementation of big data solutions in true sense for the organizations, which are not ready for future industrial demands. Interrelated theoretical lens of contextual leadership theory and strategic alignment model along with data analysis of 279 top manager from FMCG sector in Pakistan representing south Asian region provide support in favor of presented mechanism. Result analysis shows that organizational optimizations including top management commitment, strategic planning and departmental collaboration mediates the relationship between digital leadership and big data analytics. Furthermore, big data analytics has direct positive effect of data driven decision-making. Study has important managerial and theoretical implication that no matter how strong is the leadership, means through which the desire outcome could be achieve should not be ignore.

## **Key words**

Digital leadership, big data strategic planning, big data analytics, data driven decision making, Strategic alignment model.

## **1. Introduction**

A Survey of several hundred of organizations shows that the organizations, which are ready to meet the future demand of fourth industrial revolution earned 16% extra than the average net profit margin of the relevant industry Weill and Woerner (2018).

Current study integrates strategic and operational level for optimizing strategic alignment model in context to big data through digital leadership. Digital leadership is allocated for motivating top management commitment with its directions and to formulate strong strategic planning with its digitalized vision and for promoting departmental collaboration for implementing big data solutions (Agung and Darma, 2020; Klein, 2020).

### **1.1. Research Problem**

Organizations who are not in category of future ready organization are most likely to suffer or even replace by new startups and agile competitors (Weill & Woerner, 2018). Therefore, this problem is challenging existence of all traditional organizations and pragmatic researchers have to provide a clear and concise framework for dealing with it.

### **1.2. Research Importance**

Recently a case study was conducted by Surbakti et al (2020) that also stresses that strategic alignment, departmental collaboration and top management support should be studies for providing empirical evidence that these organizational factors can influence big data usage effectively.

Contextual leadership theory suggests that leaders should adopt leadership style according to situation and desired outcomes. In the context of this study contextual leadership refers to digital leadership, it will formulate strategic planning through its digitalized vision (Kane et al. 2019; Klein, 2020; Wasono & Furinto, 2018). Secondly, Digital leadership will enhancing top management commitment as it has the capability to provide vision and directions (Kane et al., 2019), whereas, Wasono and Furinto (2018) and Klein (2020) claimed that digital leadership has the capability of promoting collaboration. Enhanced top management commitment, strategic planning formed through the digitalized vision and directions and departmental collaboration will create synergy and alignment among tangible and intangible resources, which will enhance big data analytics capabilities.

We discuss strategic planning in the context of implementing big data solutions for transformation of traditional factories into smart factories for quality data driven decision-making. This transformation represents the restructuring of the firm, which must reflect through top manager's mindset and through their strategic planning. Ebrahimi and Banaeifard (2018) claims that strategic planning is a visionary phenomenon. Because, it is link with the vision of firm and current study suggest that the vision for converting factories into smart factory for quality data driven decision making must led through digital leadership because Klein (2020), Wasono and Furinto (2018) claimed that it has a vision of digitalization (Kane et al., 2019).

Current study suggests that through digital leadership, organization can overcome these organizational challenges. We argue that digital leadership has the charisma to deal with organizational barriers, which includes lack of strategic planning, top management commitment, collaboration and alignment among departments. Janssen, van der Voort, and Wahyudi (2017) also claimed that collaboration and knowledge sharing between departments is crucial for big data implementation and most recent studies are claiming that digital leader has the characteristic of collaboration (Klein, 2020; Wasono & Furinto, 2018). Strategic planning for big data implementation and collaboration among departments is important but management commitment is essential for achieving the desire outcome, recently Majid, Yasir, Yousaf, and Quadratullah (2019) and El-Kassar and Singh (2019) proves that role of management commitment essential for achieving the desire outcomes.

### **1.3. Research Objectives**

McAfee, Brynjolfsson, Davenport, Patil, and Barton (2012) argued that successful firms in future would be those adopting big data driven decision-making. However, value creation though big data is not a simple process and it requires efforts and alignment at strategic and operational levels (Awan et al., 2021). Current study aims to provide a framework to enhance data driven decision making quality through big data analytics by optimizing organizational factors including top management commitment, strategic planning and departmental collaboration as it is also among the objective of the industry 4.0 (Jain & Ajmera, 2020). Research objectives for current study is to -

1. Investigate the mediating role of top management commitment on the relationship between digital leadership and big data analytics.
2. Investigate the mediating role of big data strategic planning on the relationship between digital leadership and big data analytics.
3. Investigate the mediating role of departmental collaboration on the relationship between digital leadership and big data analytics.
4. Investigate the direct positive impact of big data analytics on data driven-decision making.

## **2. Literature Review**

Literature review chapter consist of theoretical support of contextual leadership theory and strategic alignment model. After theoretical background, literature review chapter will discuss the relationship between the relevant phenomena and proposed framework.

### **2.1. Contextual Leadership Theory and Strategic Alignment Model**

Contextual leadership theory suggests that leader should adapt leadership style according to the context and desired outcome.

Johns (2006) suggest two categories of context from where the required leadership emerges. These two categories are omnibus context and discrete context. Environmental factors which influence leadership lies under omnibus context. In current study, economic conditions are not suitable because future ready organizations are already earning 16 percent above industry average and traditional factories are paying opportunity cost because they are not transforming themselves into smart factories. Survival or existence of traditional factories depends upon their transformation into digitalized one through big data solutions, which is a major organizational change; otherwise, these traditional factories will be in major crises. All these factors like crises, economics conditions and organizational change refers towards omnibus context.

Henderson and Venkatraman (1992) proposed model for strategic alignment which is an attempt to clarify range of strategic choices for achieving strategic alignment; secondly, to explore the inter-correlation among these strategic choices to guide management practices (Smaczny, 2001). Strategic alignment model is the most accepted and recognized framework for alignment at strategic level (Wang et al. 2008).

### **2.2. Digital Leadership, Organizational Optimization, Big Data Analytics and Data Driven Decision Making**

Challenges like pace of doing business, tension between change makers and employee with traditional mindset furthermore flexibility and workplace distribution in digital era has increased to great extent as compare to traditional one (Kane et al., 2019). Kane et al. (2019) surveyed 3300 respondents and they concluded that leader should have transformative vision, forward looking (vision and strategy), digital literacy and general organizational skills such as collaboration and team building to succeed in digital era. These entire characteristic represents digital leadership, Anak Agung Sagung and Sri Darma (2020) argue that in digital era organizations need leader who could take step forward for collaboration among employee to run forward by utilizing information technology, and they named it as digital leadership. Actually digital leadership is about the utilization of resources to improve or adding value in what we do, which represents the strategic mindset of the leader (Anak Agung Sagung & Sri Darma, 2020). Strategic mindset represents the strategic planning that the leader plans for the organization that what we want to do, why we want to do, when we want to do and how we want to do. We can summarize this simply that where we are and where we are going.

Oc (2018) claimed that omnibus context of contextual leadership theory answers these questions like where we are and where we are going. That claim links digital leadership with strategic planning as earlier said that digital leadership has transformative vision and forward looking including clear vision and strategy (Kane et al., 2019). Persson (2020) also claimed that vision is important for formulating a strong strategic planning.

Contextual leadership theory supports our argument that through a clear vision, digital leader can formulate strategic plans for the organization along with top management of the firm, as digital leadership has the influential ability with a clear vision that where the firm is and where the firm has to be. Omnibus context (where) of the contextual leadership theory will guide leader that where the organization is and where it has to be. Leader should act according to the situation that “where” is demanding his transformative visionary and forward looking (vision and strategy) capabilities to formulate strategic planning for big data analytics and data driven decision making quality.

Achieving objectives (big data solutions) without sacrificing profit margin is achievable through top management commitment. Digital leader must align organizational goals for achieving organizational objective (big data solutions) (Dubey et al. 2015). Literature regarding operations and strategic domains also focuses on the alignment of goals across all level (Graves, et al. 2019). Strategic alignment model also support alignment at all the organizational level (Goepf and Avila, 2015). With an influential characteristic (Kane et al., 2019), developing commitment among top management should be among the goals of digital leadership for achieving objectives such as big data analytics and data driven decision making. Fully implementation of planned goals is more likely to be succeed when top management commitment is strong (Rodgers et al. 1993). Top management commitment is the extent to which top manager demonstrate commitment to drive the firm’s strategy (Graves et al., 2019). El-Kassar and Singh (2019) also suggest that top management commitment and large-scale data is mandatory for handling technological challenges. Implementation of technologies like big data get influence by top management’s knowledge and believe (El-Kassar & Singh, 2019). Gunasekaran et al. (2017) also highlighted the important role of top management commitment as mediator in big data context.

Oberer and Erkollar (2018) claimed that in the evolutionary process of industry 4.0 where new technology have to be adapted, cooperation and collaboration should also be developed and digital leader has to play its role in developing departmental collaboration with its collaborative feature (Kane et al., 2019). Departmental collaboration means working relation between departments within a company to achieve big data analytics for quality data driven decision-making. Big data insight is essential for big data analytics which requires departmental collaboration (Janssen et al., 2017). Knott and Thnarudee (2020) also claimed that inter-unit coordination is an important aspect; develop with day-to-day basis at micro-level interaction. Departmental collaboration is an essential component for quality decision-making because while analyzing the data analytically for taking some decision, departments should be involved in that process. Because they are the stakes holder, they are the one who collected all the data and the analytical team or data scientists will need to know about the in-depth understanding of data that what the context of data is all about.

Departmental collaboration is also important for in-depth understanding of data because data is not coming from a single department. Actually data is getting generated by all the respective department (Janssen et al., 2017). Before analyzing data analytically data scientist have to get in-depth understanding to data which is not possible without departmental collaboration (Janssen et al., 2017).

In a recent case study conducted by Dremel et al. (2017) on digital transformation of a manufacturing firm AUDI AG, authors report that in order to transform AUDI AG, situation demanded special role and they have created the post of chief digital officer for supervising all transformation related issues. After initiating transformation

process AUDI AG has faced some major challenges, which were about alignment, formulating strategy, top management commitment and departmental collaboration. They have created the post of chief digital officer but they did not elaborate its characteristics. Therefore, through a lens of contextual leadership theory, current study recommends digital leadership for such transformation as it has the capabilities to handle these challenges due to its transformative vision, influential capabilities and collaborative features. Digital leadership also possesses generic leadership skills and all of its capabilities and skills will create synergy and bring alignment at all organizational level (Goepf and Avila, 2015) for big data analytics and data driven decision making.

Based on above discussion and arguments current study proposed below hypothesis-

H<sub>1</sub>: Top management commitment mediates the positive relationship between digital leadership and big data analytics.

H<sub>2</sub>: Big data strategic planning mediates the positive relationship between digital leadership and big data analytics.

H<sub>3</sub>: Departmental collaboration mediates the positive relationship between digital leadership and big data analytics.

H<sub>4</sub>: Big data analytics is positively associated with data driven decision-making quality.

### 2.3. Framework (Figure 1)

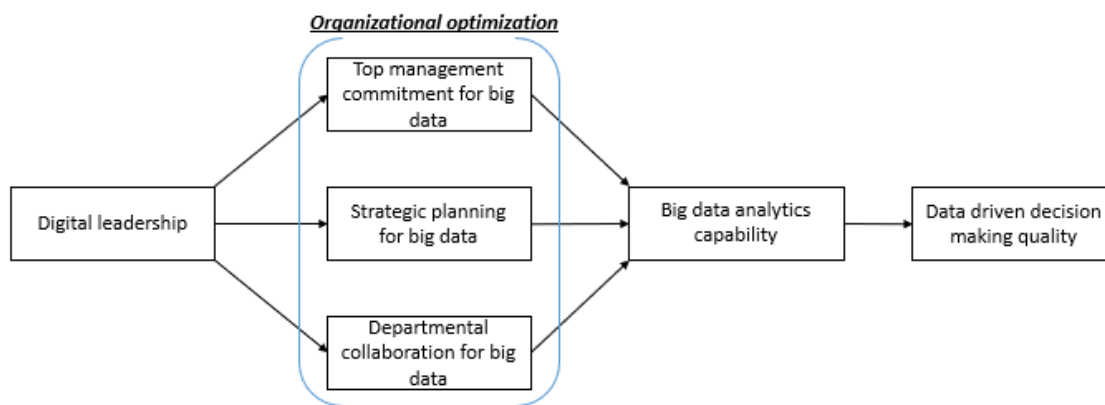


Figure 1. Framework

## 3. Methodology

Current study adopts pragmatic deductive approach and uses survey strategy to collect data from 279 senior personnel in FMCG sector operating in Pakistan. Unit of analysis for current study is organization.

### 3.1. Measures

A seven-point Likert scale was utilized to measure the construct through adapted scales. Digital leadership was measured using a four items scales adapted by Zeike, Bradbury, Lindert, and Pfaff (2019). Departmental collaboration was measured by adapting four items from Wamba et al. (2017) Big data analytics was measured as second order construct using a fifteen item scale out of which three items are for infrastructure flexibility, three items are for management capabilities and three items relates with personal capabilities. These scale is adapted from (Akter et al. 2016). Nine item were related to big data quality which is considered as an integral element of big data analytics in current study, these scales were adapted from Awan et al. (2021).

Top management commitment was measured using a five item scales, strategic planning was measured through a seven item scale and data driven decision making was measured through four item scale adapted from El-Kassar and Singh (2019), Powell (1992) and Shamim, Zeng, Shariq, and Khan (2019) respectively.

## 4. Data Collection

Sample organizations from FMCG sector were firm operating in south Asian region or in some specific countries of south Asian region are control by a single authority.

Data collection procedure is proceeded by visiting regional offices in Pakistan or through email and telephonic contact in some cases. We requested senior manager to respond to our questionnaire and then we used snowball sampling by requesting respondent to refer us to another potential respondent.

## 5. Results and Discussion

### 5.1. Reliability and validity

Reliability and validity for the constructs is confirm by applying confirmatory factor analysis. Indicators whose reliability was not up-to acceptable level was not consider for further analysis. All the results related to reliability of the constructs are presented below in below Table 1 including the convergent validity.

Table 1. Reliability and convergent validity

Constructs	Indicators	Indicators Loading	Indicators Reliability	Composite Reliability	AVE
Digital Leadership	1	0.705	0.498	0.731	0.618
	4	0.672	0.692		
	5	0.712	0.168		
	6	0.739	0.712		
Top Mgt Comm	7	0.629	0.638	0.741	0.542
	8	0.631	0.860		
	9	0.701	0.526		
	10	0.784	0.842		
	11	0.742	0.763		
Departmental collaboration	12	0.697	0.593	0.894	0.675
	14	0.692	0.608		
	15	0.749	0.835		
Strategic Planning	16	0.806	0.768	0.861	0.538
	17	0.816	0.742		
	18	0.853	0.695		
	21	0.754	0.681		
	23	0.699	0.592		
	24	0.670	0.537		
	25	0.809	0.615		
Data driven DM Quality	45	0.752	0.691	0.711	0.629
	47	0.649	0.766		
	48	0.765	0.725		
	52	0.816	0.671		
BD Analytics	INF	0.697	0.634	0.811	0.581
	MNG	0.891	0.759		
	BD Quality	0.792	0.765		

#### 5.1.1. Discriminant validity

Following Fornell and Larcker (1981) Discriminant validity is also confirm in below Table 2 where the diagonal value represents the square root of AVE while all the underlying value represent the correlation among the latent variable.

Table 2. Discriminant validity

<b>Construct</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>6</b>
1- BD Analytics	<b>0.762</b>					
2- Data driven DM Quality	0.527	<b>0.793</b>				
3- Departmental collaboration	0.647	0.745	<b>0.821</b>			
4- Digital Leadership	0.529	0.363	0.731	<b>0.786</b>		
5- Strategic Planning	0.649	0.564	0.603	0.629	<b>0.733</b>	
6- Top Management Commitment	0.596	0.618	0.592	0.701	0.534	<b>0.736</b>

## 5.2. Endogenous variable variation

$R^2$  derived through PLS algorithm reflected in Table 3, which reflects the variation in underlying variable because of other underlying variables.  $R^2$  aimed at data driven decision-making quality is noted as 0.634 that reflect 63.4% of variation in data driven decision-making quality because of big data analytics, big data analytics itself has  $R^2$  of value 0.704. That denote a disparity of 70.4% in big data analytics due to top management commitment, big data strategic planning, departmental collaboration and digital leadership. Organizational factors, which includes big data strategic planning, top management commitment, and departmental collaboration has a value of  $R^2$  as 0.613, 0.543 and 0.625 which denote 61.3%, 54.3% and 62.5% of deviation is produced by digital leadership in these organizational factors correspondingly.

Table 3. Endogenous variable variation

<b>Endogenous variables</b>	<b>R Square</b>
BD Analytics	0.704
Data driven DM Quality	0.634
Departmental collaboration	0.625
Digital Leadership	0.000
Strategic Planning	0.613
Top management commitment	0.543

## 5.3. Discussion

Current study proposed a model based on organizational optimization in which top management commitment, big data strategic planning and departmental collaboration was aligned for big data analytics and data driven decision-making quality through proposed hypothesis based on research objective. After a detail data analysis, answer to research question has been address.

Digital leadership effect all the three organizational factor including top management commitment, big data strategic planning and departmental collaboration with a same pace as its  $\beta$  value for each organizational factor is very closed to each other. These organizational factors including top management commitment, big data strategic planning and departmental collaboration effects big data analytics positively.

Results proves that organizations cannot achieve big data analytics directly without addressing organizational factors including top management commitment, big data strategic planning and departmental collaboration and these finding support the argument that lack of these organizational factors are the basic reason why big data solutions are not implemented in its true sense (Li et al. 2019).

## 5.4. Hypothesis testing

Partial least square (PLS) structural equation modeling was use to observe endogenous variable variations and path coefficient through PLS algorithm. Path coefficient significance is derive through bootstrapping procedure at 5000 runs to check whether the results are significance and found that all hypotheses are accepted with a significant level of 0.001 as depicted in Table 4 below.

Second step after confirming the mediation is to check the level of mediation for which indirect effects was calculated and found that the indirect effect is highly significant in all cases whereas the direct effect of digital leadership on big data analytics is not significant due to lower  $\beta$  value. This indicates full mediation of organizational factors including top management commitment, strategic planning and department collaboration between digital leadership and big data analytics.

Comparing results with past study is not fully possible as there are not enough number of studies for comparing the results however the positive association of big data analytics with data driven decision making quality is similar to Awan et al. (2021). As far as other relationships are concern, current study is pioneer in establishing association among these latent variables.

Table 4. Hypothesis Testing

Relationship	Direct Effect	Indirect Effect	Total effect	t-value	P-value	Proposed Hypothesis	Result
Digital Leadership -> Top management commitment -> BD Analytics	0.049	0.257	0.306	2.849	0.001	H1	Accepted
Digital Leadership -> Strategic Planning -> BD Analytics	0.049	0.586	0.635	6.184	0.001	H2	Accepted
Digital Leadership -> Departmental collaboration -> BD Analytics	0.049	0.329	0.378	2.842	0.001	H3	Accepted
BD Analytics -> Data driven DM Quality	0.772			32.597	0.001	H4	Accepted

## 6. Conclusion

Study is been conducted for survival of those firms that are not in category of future ready organization. Study has proposed a model through which, factories would convert into smart factories for their survival. Data is been collected from 279 top managers of the FMCG firms in Pakistan that represents south Asian region. Structure equation modeling was applied with bootstrapping for mediation test, results shows that organizational optimization including top management commitment, big data strategic planning and departmental collaboration is crucial for achieving big data analytics and data driven decision-making. These results derived through mediation test fulfill the research objectives of investigating the mediating role of these organizational optimization including top management commitment, big data strategic planning and departmental collaboration Without addressing these organization factors big data analytics and data driven decision-making will not be achieve and implementation of big data solutions in its true sense will remain a dream.

### 5.5. Theoretical contribution

Study contributed to contextual leadership theory that in order to achieve the desired outcomes through contextual leadership i.e. digital leadership, role of organizational optimization is central. Without organizational optimization, contextual leadership i.e. digital leadership in the context of this study cannot achieve the best-desired outcome. Digital leadership aligned all its organizational goals like top management commitment, big data strategic planning and departmental collaboration for achieving its bigger objective which is big data analytics. Alignment or consistency is also recommended in strategic alignment model (Henderson & Venkatraman, 1989) in terms of business strategy and information system planning (Avison, Jones, Powell, & Wilson, 2004) but literature did not provides any grounds that how this consistency can be develop. However, current study has also contributed toward this stream that consistency and alignment are derive by the vision, if leader's vision is closely link with the desired outcomes than consistency among organizational goals, business strategies and information system are imperative.

Current study also contributed empirically by support case study conducted by Dremel et al. (2017) by provide empirical findings that the challenges which was faced by the AUDI company during transformation procedure directly or indirectly is crucial to address for achieving big data analytics. They report several challenges but most prominent were top management commitment, strategic planning and departmental collaboration through which they were able to drive their transformation process successfully through chief digital officer.

Wamba et al. (2017) claimed that big data analytics depend upon three elements including infrastructure flexibility, management capabilities and personnel expertise capability. This study adds big data quality as an

element of big data analytics capability construct. Janssen et al. (2017) also suggested that there is multitasking work, which should be performed simultaneously based on these arguments current study incorporates big data quality under big data analytics. Because, if big data quality would rely on separate departments and provide data after performing all the data cleaning activities, there are chances that they would omit or remove some important data which quality department or other departmental head think useless. If big data quality is determined within the analytics department, they will look and observe data set according to the desired outcomes so that no potential data would be omitted.

## **5.6. Managerial Implication**

Strategic alignment model suggests that in the process of decision-making, big data analytics is the final characteristic which has to be complete and comprehensive in all senses (Henderson & Venkatraman, 1989). Incorporating big data quality under big data analytics, our study suggests managers and firms to perform these activities simultaneously under the analytics department for a comprehensive, concrete and quality data-driven decision-making. But it will generate so many if and buts in the final analytics report which is used for data-driven decision-making as highlighted by Janssen et al. (2017). These if and buts would only be tackled with human insight although current study is deployed in smart factories context but there has to be some human insight for ensuring data-driven decision-making quality in full sense. As (Awan et al., 2021) also found data-driven insights positive effect on data-driven decision-making.

Current study also provides basic but most important managerial suggestion that no matter how much the leadership style is close towards the desired outcome, leader should not avoid the means through which that desired outcome would have to be achieved. In other words, in order to achieve the bigger objective, one should not avoid the smaller goals through which bigger objective is achievable.

## **5.7. Study Limitation and Future Research Direction**

Study has provided empirical evidence that organizational factors including top management commitment, big data strategic planning and departmental collaboration influence big data analytics effectively but the literature is also suggesting discussing human-oriented optimization, technical and data-oriented optimization as well which need to be addressed in future.

## **6. Acknowledgement**

The authors acknowledge the financial support provided by the Internal Grant Agency project (IGA/FaME/2022/008 and IGA/FaME/2021/006 of FaME through Tomas Bata University in Zlín, Czech Republic).

## **Reference**

- Akter, S., Wamba, S. F., Gunasekaran, A., Dubey, R., & Childe, S. J., How to improve firm performance using big data analytics capability and business strategy alignment? *International Journal of Production Economics*, 182, 113-131, 2016. doi:<https://doi.org/10.1016/j.ijpe.2016.08.018>
- Anak Agung Sagung, M. A., & Sri Darma, G., Revealing the digital leadership spurs in 4.0 industrial revolution. *International Journal of Business, Economics & Management*, 4, 93-100, 2020. doi:DOI: 10.31295/ijbem.v3n1.135
- Avison, D., Jones, J., Powell, P., & Wilson, D., Using and validating the strategic alignment model. *The Journal of Strategic Information Systems*, 13(3), 223-246, 2004. doi:<https://doi.org/10.1016/j.jsis.2004.08.002>
- Awan, U., Shamim, S., Khan, Z., Zia, N. U., Shariq, S. M., & Khan, M. N., Big data analytics capability and decision-making: The role of data-driven insight on circular economy performance. *Technological Forecasting and Social Change*, 168, 120766, 2021. doi:<https://doi.org/10.1016/j.techfore.2021.120766>
- Dremel, C., Wulf, J., Herterich, M. M., Waizmann, J.-C., & Brenner, W., How AUDI AG Established Big Data Analytics in Its Digital Transformation. *MIS Quarterly Executive*, 16(2), 2017.
- Dubey, R., Gunasekaran, A., & Ali, S. S., Exploring the relationship between leadership, operational practices, institutional pressures and environmental performance: A framework for green supply chain. *International Journal of Production Economics*, 160, 120-132, 2015. doi:<https://doi.org/10.1016/j.ijpe.2014.10.001>
- Ebrahimi, A., & Banaeifard, H., The influence of internal and external factors on the marketing strategic planning in SNOWA Corporation. *Journal of Business Industrial Marketing*. 2018. doi:<https://doi.org/10.1108/JBIM-02-2018-0083>
- El-Kassar, A.-N., & Singh, S. K., Green innovation and organizational performance: the influence of big data and the moderating role of management commitment and HR practices. *Technological Forecasting Social Change*, 144, 483-498, 2019. doi:<https://doi.org/10.1016/j.techfore.2017.12.016>



- Fornell, C., & Larcker, D. F., Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research*, 18(1), 39-50, 1981. doi:<https://doi.org/10.1177/002224378101800104>
- Goepf, V., & Avila, O. , An Extended-Strategic Alignment Model for technical information system alignment. *International Journal of Computer Integrated Manufacturing*, 28(12), 1275-1290, 2015. doi:<https://doi.org/10.1080/0951192X.2014.964774>
- Graves, L. M., Sarkis, J., & Gold, N., Employee proenvironmental behavior in Russia: The roles of top management commitment, managerial leadership, and employee motives. *Resources, Conservation and Recycling*, 140, 54-64, 2019. doi:<https://doi.org/10.1016/j.resconrec.2018.09.007>
- Gunasekaran, A., Papadopoulos, T., Dubey, R., Wamba, S. F., Childe, S. J., Hazen, B., & Akter, S. (2017). Big data and predictive analytics for supply chain and organizational performance. *Journal of Business Research*, 70, 308-317. doi:<https://doi.org/10.1016/j.jbusres.2016.08.004>
- Henderson, J. C., & Venkatraman, N. , Strategic alignment: a framework for strategic information technology management, 1989.
- Henderson, J. C., & Venkatraman, N., Strategic alignment: a model for organizational transformation through information technology. *Transforming organizations*, 97-117, 1992.
- Jain, V., & Ajmera, P, Modelling the enablers of industry 4.0 in the Indian manufacturing industry. *International Journal of Productivity Performance Management*. 2020. doi:<https://doi.org/10.1108/IJPPM-07-2019-0317>
- Janssen, M., van der Voort, H., & Wahyudi, A. , Factors influencing big data decision-making quality. *Journal of Business Research*, 70, 338-345, 2017. doi:<https://doi.org/10.1016/j.jbusres.2016.08.007>
- Johns, G. , The essential impact of context on organizational behavior. *Academy of management review*, 31(2), 386-408, 2006. doi:<https://doi.org/10.5465/amr.2006.20208687>
- Kane, G. C., Phillips, A. N., Copulsky, J., & Andrus, G., How digital leadership is (n't) different. *MIT Sloan Management Review*, 60(3), 34-39, 2019.
- Klein, M., Leadership characteristics in the era of digital transformation. *Business Management Studies: An International Journal*, 8(1), 883-902, 2020. doi:<https://doi.org/10.15295/bmij.v8i1.1441>
- Knott, P., & Thnarudee, C., Strategic planning as inter-unit coordination: An in depth case study in Thailand. *Asia Pacific Journal of Management*, 1-24, 2020. doi:<https://doi.org/10.1007/s10490-020-09726-w>
- Li, S., Peng, G. C., & Xing, F., Barriers of embedding big data solutions in smart factories: insights from SAP consultants. *Industrial Management Data Systems*.2019 doi:<https://doi.org/10.1108/IMDS-11-2018-0532>
- Majid, A., Yasir, M., Yousaf, Z., & Qudratullah, H., Role of network capability, structural flexibility and management commitment in defining strategic performance in hospitality industry. *International Journal of Contemporary Hospitality Management*. 2019. doi:<https://doi.org/10.1108/IJCHM-04-2018-0277>
- McAfee, A., Brynjolfsson, E., Davenport, T. H., Patil, D., & Barton, D., Big data: the management revolution. *Harvard business review*, 90(10), 60-68, 2012.
- Oberer, B., & Erkollar, A., Leadership 4.0: Digital leaders in the age of industry 4.0. *International Journal of Organizational Leadership*. 2018. doi:<https://ssrn.com/abstract=3337644>
- Oc, B. , Contextual leadership: A systematic review of how contextual factors shape leadership and its outcomes. *The Leadership Quarterly*, 29(1), 218-235, 2018. doi:<https://doi.org/10.1016/j.leaf.2017.12.004>
- Persson, C. , Perform or conform? Looking for the strategic in municipal spatial planning in Sweden. *European Planning Studies*, 28(6), 1183-1199, 2020. doi:<https://doi.org/10.1080/09654313.2019.1614150>
- Powell, T. C., Research notes and communications strategic planning as competitive advantage. *Strategic management journal*, 13(7), 551-558, 1992. doi:<https://doi.org/10.1002/smj.4250130707>
- Rodgers, R., Hunter, J. E., & Rogers, D. L. , Influence of top management commitment on management program success. *Journal of Applied Psychology*, 78(1), 151, 1993. doi:<https://doi.org/10.1037/0021-9010.78.1.151>
- Shamim, S., Zeng, J., Shariq, S. M., & Khan, Z., Role of big data management in enhancing big data decision-making capability and quality among Chinese firms: A dynamic capabilities view. *Information & Management*, 56(6), 103135, 2019. doi:<https://doi.org/10.1016/j.im.2018.12.003>
- Smaczny, T., Is an alignment between business and information technology the appropriate paradigm to manage IT in today's organisations? *Management decision*. 2021 doi:<https://doi.org/10.1108/EUM0000000006521>
- Surbakti, F. P. S., Wang, W., Indulska, M., & Sadiq, S., Factors influencing effective use of big data: A research framework. *Information & Management*, 57(1), 103146, 2021. doi:<https://doi.org/10.1016/j.im.2019.02.001>
- Wamba, S. F., Gunasekaran, A., Akter, S., Ren, S. J.-f., Dubey, R., & Childe, S. J., Big data analytics and firm performance: Effects of dynamic capabilities. *Journal of Business Research*, 70, 356-365, 2017. doi:<https://doi.org/10.1016/j.jbusres.2016.08.009>

- Wang, X., Zhou, X., & Jiang, L. ., *A method of business and IT alignment based on enterprise architecture*. Paper presented at the *2008 IEEE International Conference on Service Operations and Logistics, and Informatics*. 2008.
- Wasono, L. W., & Furinto, A., The effect of digital leadership and innovation management for incumbent telecommunication company in the digital disruptive era. *International Journal of Engineering Technology*, 7, 125-130, 2018.
- Weill, P., & Woerner, S. L. (2018). Is your company ready for a digital future? *MIT Sloan Management Review*, 59(2), 21-25.
- Zeike, S., Bradbury, K., Lindert, L., & Pfaff, H. , Digital leadership skills and associations with psychological well-being. *International journal of environmental research public health*, 16(14), 2628, 2019. doi:<https://doi.org/10.3390/ijerph16142628>.

## **Biographies**

**Syed Muhammad Shariq** is a PhD student in Department of Industrial Engineering and Information Systems at Faculty of Management and Economics of the Tomas Bata University in Zlín, Czech Republic. His broader research domains are Big Data, Industry 4.0, Knowledge Management and industrial digitalization. His publications have appeared in *Journal of Knowledge Management, Information and management, International business review and Technological forecasting and social change*.

**Felicita Chromjaková** is a Professor by Industrial Engineering and Information Systems Department, Faculty of Management and Economics, Tomas Bata University in Zlín (CZ). She is active in the field of lean management, process management systems, Industry 4.0 concepts development for small and medium enterprises. She has been recognized as a professional management consultant with over 30 years of experience in working with closely-held businesses. She has taught courses in production planning and scheduling, industrial engineering and production process innovations. His research orientation is based on the analysis, diagnostics and development of lean, automated and digitized production process models for industrial companies, connected with optimal and flexible production performance and customer oriented value added.

**Khalid Ahmed Attia Mohamed** is a PhD student in Department of Industrial Engineering and Information Systems at Faculty of Management and Economics of the Tomas Bata University in Zlín, Czech Republic. His broader research domains are Big Data and industrial digitalization. Accomplished a professional master degree from Latvia University of Life Sciences and Technologies in cooperation with the Rosenhiem University of Applied Science.