

The effect of big data in transforming to learning organization a single-case study in IT sector

The effect of
big data

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Abstract

Purpose – The purpose of this paper is to examine the contribution of big data in the transforming process of an IT firm to a learning organization.

Design/methodology/approach – The authors adopted a qualitative research approach to define and interpret the ideas and experiences of the IT firms' employees and to present them to the readers directly. For this purpose, they followed a single-case study design. They researched on a small and medium enterprise operating in the IT sector in Düzce province, Turkey. This paper used a semi-structured interview and document analysis as data collecting methods. In all, eight interviews were conducted with employees. Brochures and website of the organization were used as data sources for the document analysis.

Findings – As a result of in-depth interviews and document analysis, the authors formed five main themes that describe perception of big data and learning organization concepts, methods and practices adopted in transforming process, usage areas of big data in organization and how the sample organization uses big data as a learning organization. The findings of this paper show that the sample organization is a learning IT firm that has used big data in transforming to learning organization and in maintaining the learning culture.

Research limitations/implications – The findings contribute to literature as it is one of the first studies that examine the influence of big data on the transformation process of an IT firm to a learning organization. The findings reveal that IT firms benefit from the solutions of big data while learning. However, as the design of the research is single-case study, the findings may be specific to the sample organization. Future studies are required that examine the subject in different samples and by different research designs.

Originality/value – In literature, research on how IT firms' managers and employees use big data in organizational learning process is limited. The authors expect that this paper will shed light on future research that examines the effect of big data on the learning process of the organization.

Keywords Learning organization, Organizational learning, Big data, IT firm

Paper type Research paper

1. Introduction

Nowadays, organizations are required to be different and competitive to survive in constantly changing and complex global markets (López *et al.*, 2005). The fierce global competition has also created a more complicated and unforeseen working environment for organizations (Bontis *et al.*, 2002). In these increasingly competitive markets and complicated conditions, the organizations must continuously learn and improve the abilities,



information and customs related with products, processes and social relations to continue their existence (Bhatt and Zaveri, 2002). The information and the abilities that were gained in the past might become old-fashioned, and new skills and competencies are required to be successful in the future (Edmondson and Moingeon, 1998). The data, as a power and a source, has strategical importance for both individuals and organizations (Liao *et al.*, 2008). Living by adapting to an environment full of uncertainty and changes depends on the learning ability of the individuals and organizations (Edmondson and Moingeon, 1998). The organizations that cannot improve their learning potential will likely find themselves among losers in the short term (Buechel and Probst, 2000).

Today, executive board members of IT organizations discuss about big data. Many of them believe that big data will reveal new organizational abilities and values (Davenport *et al.*, 2012). Big data inspire organizations, all industries and even the society to not only transform but also find solutions for the working difficulties (Miele and Shockley, 2013). Executives can acquire more knowledge about their organizations by making more realistic analyses through the big data. Thanks to the analytics, data can be transformed into intelligence and used in the decision-making process, and this actionable information positively affects organizational performance (McAfee and Brynjolfsson, 2012). Big data leads to a paradigm shift to a new age where strategy no more influences data but data influence strategy; hence, organizations, such as Facebook, Apple, Alphabet and Google, use big data as a strategy and gain a tremendous competitive advantage that enhances their ecosystem by providing new data flows and innovation through continuous learning (Mazzei and Noble, 2017). Thus, learning is a vital capability for organizations to survive in the big data age.

The challenge that organizations face in today's business world is to not only exploit but also explore knowledge from big data as a result of data and information analysis processes (Le Dinh *et al.*, 2018). However, research that focuses on the effect of big data on the decision-making process is scarce (Poletto *et al.*, 2017). A considerable number of studies have been conducted on learning organization concept. Literature review shows that the studies on "Big Data" and "Learning Organization" mostly focus on application, theory and implications in different fields. However, research that examines big data and learning organization concepts is relatively scarce. Research on this issue generally develops and tests research models that are composed of organizational theory components (e.g. exploration and exploitation) and big data (e.g. velocity, variety, veracity and volume) or business intelligence (BI) components. Organizational learning components are generally used as a moderator variable in examining the influence of big data (or knowledge creation process) on organizational performance, innovation capability or business value (Bordeleau *et al.*, 2020; Ghasemaghahi and Calic, 2019a, 2019b; Fink *et al.*, 2017).

Additionally, some part of the studies examined the influence of big data on learning processes in organizations. For example, Poletto *et al.* focused on how the integration of big data, BI and decision support systems affect and produce new knowledge from historical data and, in turn, enable decision-makers to combine their tacit knowledge and the new knowledge obtained from big data analysis. Castellano *et al.* (2017) focused on implementing organizational learning models based on big data management principle in the context of implementing IT strategy. Jenkin (2013) attracted attention on the issue that how data and information sources can foster learning and also provoke intuition. The author proposed a fifth process called "information foraging" to Crossan *et al.*'s (1999) 4I model.

The studies we mentioned above are important, as they examined the issue from a different point of view by focusing on the effect of big data and big data analytics on organizational learning processes. In this research, we aimed to research in depth and focus

directly on the influence of big data in the transforming process of an IT firm to a learning organization by benefiting from the advantages of qualitative research. Consequently, we based our study on following research questions:

RQ1. Which processes does an IT firm go through in transforming to a learning organization?

RQ2. How does big data influence an IT firm's transformation process to a learning organization?

To answer these questions, we followed a single case study design and defined an IT firm operating in Düzce province in Turkey as the sample case. We gathered data both by qualitative interview method and document analysis. During the data gathering process, at first, we seek to define perceptions of learning organization and big data of organization and then how an organization uses big data and establishes a continuous learning practice. We applied inductive content analysis to the data in this respect. As a result, we presented our finding under five main themes.

The paper continues as follows. In the following section, we present conceptual background of the concepts “learning,” “learning organizations” and “big data,” then we review the research that examines the relationship between learning organizations and big data. In the Method section, we introduce our research design, single case study. In the Findings section, we present our findings under five main themes. After that, we discuss the contribution of research. And finally, we conclude the paper by presenting limitations of research and recommendations for future research.

2. Conceptual background and literature review

2.1 Concepts of learning and learning organizations

Klein (2018) defines “learning” as relatively permanent changes in the behaviors of the individuals based on their experiences. Learning means obtaining knowledge and ability (Kim, 1993). According to Stata (1989), learning is a process through which individuals gain new information and comprehension and change their behaviors and actions. Learning first occurs when a deficit is corrected that emerged between the aims and results of the actions of individuals (Argyris, 1995).

The concepts of “learning organization” and “organizational learning” are used in place of each other in the literature frequently. A learning organization involves a large area including the individual developments and organizational adjustments. Organizational learning is a sub-group of learning organization studies. Because of this, when the definition of “organizational learning” is articulated clearly, the definition of “learning organization” concept will follow it (Edmondson and Moingeon, 1998). Two types of learning are emphasized in organizational learning: one- and two-way learning models. These learning models come from Argyris and Schon's action theory which sees human beings as a behavior designer. One-way learning is the low level of learning (Fiol and Lyles, 1985). It involves correcting the actions. If a problem emerges during the production phase of any product, then one-way learning is preferred for solving the problem, and two-way learning is acquired when it is questioned whether that product should be produced or not (Argyris, 1977).

McGill and Slocum (1993) defined four kinds of organizations according to their learning levels: knowing organizations, understanding organizations, thinking organizations and learning organizations. According to authors, knowing organizations are the former form of organizations that are based on routines, control, efficiency and a proven “track record.”

These organizations (e.g. McDonalds) operate as a “machine” and every member knows what to do to maintain the flow of business. By 1980s, as the market conditions changed, organizations commenced to recognize that following a “one best way” strategy in doing business was not the best option anymore. Many companies transformed to strong-culture organizations that are defined as “understanding organizations” by [McGill and Slocum \(1993\)](#). In those years, “understanding organizations” were customer-oriented organizations that struggle to promote their “core values” to employees and customers (e.g. IBM and Procter&Gamble). However, these organizations stuck to their “rule of myths” (p. 71). They only consider change on the condition that it fits to their core values. And thinking organizations are at the third stage of organizational learning organizations that focus on problem-solving and fast-fix solutions. However, these organizations are incapable of revealing the root cause of the problems. Finally, the ultimate level of organizational learning is learning organization. According to [McGill and Slocum \(1993\)](#), learning organizations “process both the experience and the way the organization experiences it” (p.73). The authors defined distinctive features of learning organizations as “openness, systemic thinking, creativity, personal efficacy, and empathy” (p.76).

[Senge \(1994: 8\)](#), who has the biggest share in the increasing interest toward the importance of learning organizations, explains learning organizations as follows:

Organizations where people continually expand their capacity to create the results they truly desire, where new and expansive patterns of thinking are nurtured, where collective aspiration is set free, and where people are continually learning how to learn together.

[Senge \(1994\)](#) also defines five disciplines which guide learning organizations to fulfil their ambitions in his seminal book *The Fifth Discipline: The Art and Practice of the Learning Organization*: personal mastery, mental models, shared vision, team leading and systems thinking. According to [Senge \(1994\)](#), personal mastery is based on ability and succeeding; however, it is something beyond these concepts. Individuals who adopt personal mastery correctly keep living in a constant learning mode, but the ultimate level can be never achieved. In other words, they never think that they have learned everything ([Senge, 1994](#)). The second discipline “mental models” examines how individuals interpret the world and defines how they act accordingly. “Shared Vision” is the common vision that is adhered to by members of organization, and also, it reflects members’ own personal goals. Shared vision helps the organization to provide the motivation needed to reach learning and to focus attention on a particular point. Team learning is the process of improving the ability of achieving the shared goals of individuals both in the organization and in the team by looking at the same direction just as a group of musicians acting at the same time and performing a wonderful musical fest ([Senge, 1994](#)). Consequently, [Senge \(1994\)](#) states that the fifth discipline –systems thinking – has the power of integrating the other four disciplines, and it is the ability of seeing relations among the events as a whole.

The pre-condition of forming a learning organization is to enable organizational learning and to give individuals the opportunity of reflecting and developing their own thinking process ([Edmondson and Moingeon, 1998](#)). Learning organizations encourage, support, accelerate and reward the individual learning through an organizational system which supports self-improvement ([Marquardt, 2011](#)). Learning organizations are managed by a common vision which focuses the capacities of members on producing value for customers. Besides, they always collect, process and distribute information about markets, products, technologies, working processes and organizations ([Slater and Narver, 1995](#)).

Organizations go through some learning stages while changing into learning organizations. These stages are “learning individually,” “learning as a team” and

“organizational learning” (Avci *et al.*, 2010). One of the important factors in forming a learning organization is “individual learning” (Simon, 1991). Individual learning appears to be a product of inner visions, abilities and experiences of individuals that lead to changes in their potential behaviors and cognitive structures (Buechel and Probst, 2000). During “learning as a team” stage, when feedback is received as an outcome of individual learning, members take actions to spread this feedback in the team and, accordingly, make changes for improving and adjusting (Edmondson, 2002). Hence, organizational learning is a new way of learning today.

Gathering data, distributing data, interpreting data and organizational memory provide an indispensable assistance to the process of organizational learning (Huber, 1991). The aim of many organizational operations is the target information. Customer questionnaires, research and development activities, performance investigations and analyses of rival products are examples of this subject (Huber, 1991). During the process of data distribution, each piece of information reminds organization members to question about how to use and benefit from it, and if that is understood by all organization members clearly, then the value of data will be enhanced (Slater and Narver, 1995). The process of interpreting data is critical. After the data has been distributed in the organization, it should be interpreted so that it can be used in any situation; otherwise, it will only occupy a place in the storage area of the organization before learning is obtained. The experiences of organization members, business disciplines and reaction of the organization to the events are stored in organizational memory for reusing them in the future.

It is essential to discover new management tools and techniques to reach consensus to make organizational learning transformation process easier (Stata, 1989). A learning organization is the one that can acquire and create the data, can transform the data it obtained into the organization and has the ability of changing attitudes through reflecting new information and insights (Garvin, 1993).

2.2 Big data concept

Today, organizations are data orientated and continue their operations within a data ecosystem. Data, the raw form of information, is an important source for organizations. The term big data represents the amount of data that traditional software tools are insufficient to catch, process and manage (Cackett, 2013). Big data involves the tools which are more advanced than traditional database software and which obtain, protect, manage, make accessible and analyze data sets (Brown *et al.*, 2011). Thanks to big data, managers can make rational evaluations about their organizations, gather diverse information, come to right decisions in the light of this information and then transform them into performance (McAfee and Brynjolfsson, 2012).

Ward and Barker (2013) conducted a literature survey and found that size, complexity and technologies are the critical points mentioned in big data definitions. All definitions include one of these points and the authors presented a big data definition basing on these three factors; “Big data is a term describing the storage and analysis of large and or complex data sets using a series of techniques including, but not limited to: NoSQL, MapReduce and machine learning” (p. 2).

In Gartner IT Glossary (2012), big data is defined as “high-volume, high-velocity and/or high-variety information assets that demand cost-effective, innovative forms of information processing that enable enhanced insight, decision making, and process automation.” The industry generally uses the definition named 3V (volume-velocity-variety). As technology improves in speed, the number of data sets related to the past would not be valid at the

present time. Likewise, if the volume of the data used in your operation area is bigger than the former one, then this means you deal with big data (Cackett, 2013).

The “volume” of data is important for organizations. When an organization works with 300 data sets instead of 6, it can solve the problem of the customer more accurately. You can manage big data effectively on the condition that you have well-prepared database management systems (Wilder-James, 2012). The “velocity” feature requires the data to be handled in real time. The lags in this period delay the validity and efficiency of the campaigns as the findings obtained have not been put into practice, it would be difficult to take actions or lead to that a variety of circumstances may arise. For instance, if the customers are not informed about sale offer before they leave the store, then this would affect the sales performance negatively (Cackett, 2013). The most important characteristic of big data is the diversity of the sources it benefits and for it does not have good, relation-based structure (Wilder-James, 2012). The data with high “variety” is exposed to different processes while it is being analyzed. Generally, the process of analysis involves the stages of collecting and recording data, sorting information and data cleansing, data integration, grouping and designing, query processing, data modeling and analyzing and interpreting the findings (Agrawal *et al.*, 2011).

Besides the three fundamental features of big data (3V), two Vs were added: Value and Veracity (Fosso-Wamba *et al.*, 2015). “Value” represents the financial benefit that big data provides to the organization, and “Veracity” dimension of big data, recommended by White (2012), puts emphasis on the accuracy of data (Fosso-Wamba *et al.*, 2015). According to White (2012), “If data is not of sufficient quality by the time it has been integrated with other data and information, a false correlation could result in the organization making an incorrect analysis of a business opportunity” (p. 211). Hence, veracity is an important dimension of big data. Consequently, we can say that big data concept is generally defined on five fundamental features – (5V) volume, velocity, variety, value and veracity – in the literature. Fosso-Wamba *et al.* (2015) defined big data including these five fundamental features as follows (p. 235):

We define “big data” as a holistic approach to manage, process and analyze 5 Vs (i.e., volume, variety, velocity, veracity and value) in order to create actionable insights for sustained value delivery, measuring performance and establishing competitive advantages.

2.3 Research on organizational learning and big data

According to International Data Cooperation white paper, Global Datasphere will expand to 175 ZB and six billion people will interact with data over 4,900 times per day, not so far but by 2025 (Reinsel *et al.*, 2018). These are such huge numbers that big data technology has the potential of changing traditional understandings and perceptions in the business world. In recent years, big data have been attracted great attention from scholars, and many papers are published on the issue of how big data influence businesses. Mazzei ve Noble (2017) introduced three tiers on the value big data provide to organizations: data as a tool, data as an industry and data as a strategy. Organizations that are in the third tier focus on data flow rather than instant profits. Mazzei ve Noble (2017) defines organizations in this group as “learning organizations.” They use knowledge based on data flow as a driving force to enhance their ecosystems. They build data stocks, increase data flow and gain profits to enhance their product lines or invest in new business lines. They consistently innovate and learn new technologies and penetrate in their customer’s lives by increasing their life quality such as prominent companies of Facebook, Apple and Alphabet. The authors attract attention on the issue that the direction of influence between data and strategy has changed.

According to traditional perception, strategy influences data, but in big data world, data influence strategy. And learning organizations take the lion's share. Therefore, it is important to organizations to transform into learning organizations.

In literature, great deal of research conducted empirically demonstrates that learning skills add business value to organizations (Mavondo *et al.*, 2005; Škerlavaj *et al.*, 2007; Santos-Vijande, *et al.*, 2012; Obeso *et al.*, 2020), but research that focused on big data phenomenon through an organizational learning lens is relatively scarce. Ghasemaghaei and Calic (2019a, 2019b) conducted a series of empirical research that examines the effect of big data on decision quality and innovation competency of firms. In the first paper, authors integrated organizational learning theory (OLT) and data quality framework and constructed a research model. In this model, data quality and data diagnosis play a moderator role in understanding the effect of processing and interpreting big data on decision quality. According to the findings, big data does not influence decision-making directly but through data quality and data diagnosis. In the second paper, Ghasemaghaei and Calic (2019b) examined the effect of big data processing on innovation competency through data-driven insight types (descriptive insight, predictive insight and prescriptive insight). Authors adopted Gestald learning theory (GLT) and OLT in forming the research model; GLT was used as a foundation for data-driven insight and OLT for innovation capacity (exploration competency and exploitation competency). According to the findings, three fundamental big data features – velocity, variety and veracity – have a positive impact on data-driven insight; and in turn, descriptive and predictive insights enhance innovation capability of the firm. In this research, authors handled features of big data separately as volume, velocity, variety and veracity (4V), and no significant effect of data volume on generating insight was found. Also, authors considered data-driven insights in three categories adopted from GLT – descriptive, predictive and prescriptive insight; and it was defined that predictive insight does not have a significant effect on firm's exploration competency.

There are also studies that examine business value produced through BI processes with an OLT lens. BI can be defined as a process through which data is transformed into actionable intelligence (i.e. knowledge) to include in decision-making (Negash, 2004). Bordeleau *et al.* (2020) focused on new data flow in Industry 4.0 transformation process and examined the factors that influence business value in manufacturing industries from a BI and analytics perspective. According to the findings, organizational learning (exploration and exploitation) and culture have a crucial impact on enhancing business value in manufacturing companies. Fuchs *et al.* (2014) also adopted a BI approach and introduced a destination management information system (DMIS-Åre) and implemented this system in a mountain tourism destination. According to the findings, this system provides a pre-condition for organizational learning, as it provides knowledge creation and application. The authors propose that knowledge creation and acquisition processes (customer-based knowledge) can be enhanced by BI methods.

Fink *et al.* (2017) developed and tested a research model based on resource-based view and organizational learning to examine BI value. According to the findings, BI assets (technology and team) create more powerful BI capabilities in an exploitative organizational environment and more powerful strategic capabilities in an explorative environment. Fink *et al.*'s (2017) model provided a conceptual coherence between two BI capabilities (operational and strategic) and two organizational learning mechanisms (exploitation and exploration). Thus, an organization can be ambidextrous in BI capabilities as in organizational learning approach. The author used organizational learning as a theoretical

lens in examining business value produced by BI and, hence, highlighted the importance of organization context in transforming BI assets to BI capabilities.

Arefin *et al.* (2020) examined the mediating role of BI systems in examining the effect of OL culture on organizational performance in the health-care sector. According to the findings, OL has a significant effect on BI systems and, in turn, plays an important role in enhancing business performance.

The research we mentioned above uses components of OLT as a moderator in defining how to process and interpret the effects of big data on organizational performance, business value or innovation competency. Besides these studies, relatively few studies have been conducted that handle the issue from the perspective that focuses on the effects of big data and data analytics on decision-making and organizational learning processes (Castellano *et al.*, 2017; Le Dinh *et al.*, 2018; Jenkin, 2013). However, in the literature review process, we could not find an empirical study that investigates the transformation process of an organization to a learning organization. Hence, this research aimed to contribute to close this gap in literature.

3. Method

In this study, we adopted a qualitative research approach and followed a single, holistic case study design to gather detailed information about the perceptions of IT firms' employees on learning organization and big data concepts and to evaluate the contribution of big data on the learning process. Creswell (2007) stated that case study is considered under different categories by researchers such as "a strategy of inquiry, a methodology, or a comprehensive research strategy" and expressed his choice of definition as follows (p.73):

Case study research is a qualitative approach in which the investigator explores a bounded system (a case) or multiple bounded systems (cases) over time, through detailed, in-depth data collection involving multiple sources of information (e.g., observations, interviews, audiovisual material, and documents and reports), and reports a case description and case-based themes. For example, several programs (a multi-site study) or a single program (a within-site study) may be selected for study.

In this research, we adopted Creswell's (2007) approach and followed a single, holistic case study as a qualitative research design and carried out the stages presented in Table 1.

3.1 Sample case

The sample organization is a SME operating in the IT sector that provides exploration, counselling, designing, projecting, implementation, education and service for security systems, infrastructure systems, automation systems and software system that are generally defined under weak current systems. The organization was founded in 2001 and institutionalized in 2010 in Düzce province of Turkey. The customer portfolio of the SME consists of education, housing, tourism, health, industry, trade and public.

3.2 Interview data

We choose the participants of interviews among employees of the organization that are managers authorized of decision-making, software developer team and technical team. The first author conducted interviews with three managers authorized of decision-making, two software developers and three technicians (eight employees in total). We used the semi-structured face-to-face qualitative interview method. The semi-structured interview is commonly used as a data gathering method in qualitative research. In this method, interview questions are formed beforehand and supported by probes; but during the

Stages	Application
1. Defining case study as an appropriate design for the study	The aim of this research is to investigate IT firms' transformation to learning organizations and the effect of big data on these processes. As we decided to conduct an in-depth and detailed research, we chose to study a single IT firm as our sample. Thus, a single, holistic case study is the appropriate design for our study
2. Identifying the case of the study	The population of the study is the organization that operate in the IT sector in Düzce. As the design of the study is case study, only one organization was defined as the sample case
3. Collecting data	We used multiple data gathering methods: 1. Semi-structured face-to-face qualitative interview method 2. Document analysis
4. Analyzing data	We adopted a holistic analysis of our single case. A deductive qualitative content analysis was applied to the interview data and document analysis was applied to document data
5. Reporting the findings	We reported the case we examined under main themes that describe how big data influence the sample organization's transformation process to learning organization. We supported our finding with quotes of participants and also presented comparison between two data sources

Table 1.
Research process

Source: Table is composed by the authors, five research stages are adapted from [Creswell \(2007\)](#)

interview, the order of the questions can be changed or improvised questions can be posed to participants ([Creswell, 2012](#)). In the data gathering process, we used an interview form as a data gathering tool. We prepared interview questions according to the research questions. We designed two interview forms. The first form consisted of 13 questions prepared for employees who are authorized of decision-making and the second form consisted of nine questions for the other employees. We referred to two academics who have expertise in the research subject to ask their opinions during the preparation of interview forms. After we received their feedback, we redesigned the interview forms.

The interviews were conducted in working environments of the employees from May 2019 to September 2019 by the first author. Interviews were recorded using an audio recorder with participants' permission. We deciphered audio data into written form and saved on a .doc file. After that, we sent the interview files to participants via e-mail and asked them to check these files. After we received confirmation from participants, we started the analysis process.

3.3 Document data

We decided to use secondary data to support our interview findings and gathered documents that are related to our research questions. The documents we used as data are brochures published by the organization that include general overview of their business line and customer views. We also reviewed the official web page of the organization and used the public data that was available on this page such as documents about customer satisfaction surveys.

3.4 Content analysis

In the content analysis process, we adopted a deductive approach and we applied "directed content analysis" to the data. In the directed content analysis approach, categories are

determined according to a theory related with the subject of research (Hsieh and Shannon, 2005). Accordingly, we defined following themes and searched them in the data.

- perception of learning organization concept;
- perception of big data concept;
- methods and implementations used in transforming to a learning organization;
- usage of big data; and
- a learning IT organization.

We also used these themes in the document analysis process with one exception. The theme entitled “The organization from the customer’s eye” was used in the document analysis process instead of the theme “A Learning IT Organization,” as it was impossible to extract data from the documents related with the former theme. We preferred the title “The organization from the customer’s eye” because of the fact that documents were prepared mostly for promotional purposes and the content of the documents was designed according to customers’ views. Hence, this theme provides answers for the question “how do customers see, describe and delineate the organization from outside?”

4. Findings

As a result of the inductive/directed content analysis applied to the interview data, we formed five themes linked to 13 categories and 61 codes:

- (1) perception of learning organization concept;
- (2) perception of big data;
- (3) methods and practices adopted in transforming to a learning organization;
- (4) usage of big data; and
- (5) a learning IT organization.

In the document analysis, besides the first five themes above, we formed a sixth theme specific to document data:

- (1) Organization from customer’s eye.

Hence, as a result of the document analysis, we obtained six themes. The themes consist of 10 categories and 28 codes.

4.1 Perception of learning organization concept

This theme represents how big data concept is perceived by the sample organization. Findings of interview and document analyses are presented in [Table 2](#).

According to the interview analysis, findings show that participants’ definitions of learning organization concept have a lot of common points with the definition of the concept in literature. The participants think that a learning organization is an organization that continually develops, changes, finds new systems and learns new things while working. Participants also emphasized that they renew themselves through learning and implement what have learnt in business processes just like students that practice what they have learnt in the school. They learn by researching and improving themselves with what they have learnt and give importance to the “art of working.”

Findings of interview and document analysis support each other. For example, the statement “learn and implement new technologies” in a promotional catalogue is similar to

Perception of learning organization concept				The effect of big data
Interview analysis		Document analysis		
Categories	Codes	Categories	Codes	
Definitions in literature	–Collecting and creating data –Data transfer –Attitude change	Achieving learning	–Following developments –Renovation –Following new technologies –Research	Table 2. Findings on “perception of learning organization concept”
Participants’ definitions	–Continual learning –Art –Getting information –Training –Change –System development –Implementation –R&D	Continuous learning	–Implementation of what is learnt –Training	

the definition in the learning organization literature. The organization aims to provide performance by implementing the new technology it has just learnt.

4.2 Perception of big data concept

The theme represents how big data is perceived in the organizations. The categories and codes linked to the theme are presented in [Table 3](#).

We found that the basic features of big data 3V (high velocity, high volume and high variety) is articulated by participants repeatedly when we asked them to define big data. Besides these fundamental features (3V), the participants emphasized some other benefits of big data when defining the concept. For example, a member stated that they can extract, record, repeat and backup the necessary data which, in turn, helps them to reach organizational goals. They also emphasized that they could store customer data and, thus, they can use it when needed; moreover, they can do it with their own software. According to the definitions of participants about big data, we can say that the big data concept is perceived correctly in the sample organization.

Unfortunately, we could not find much data on the definition of big data concept from the documents of the company; instead, we formed categories “Being an IT firm” and “Customer services.” The first category represents the features of the company that define it as a big data-driven IT firm. The second category shows how big data provide benefits to customers.

Perception of big data			
Interview analysis		Document analysis	
Categories	Codes	Categories	Codes
Definitions in literature	–High velocity –High volume –High variety	Being an IT firm	–Being technology driven –Technological solutions
Participants’ definitions	–Recordable –Analyzable –Processable –Backup	Customer services	–Accessible –Customized solutions –Continuous improvement

Table 3.
Findings on
“perception of big
data”

Organization is accessible, can produce customized products/services and improve continuously by using big data. Consequently, we can say that document analysis findings support the interview data that show that organization’s big data perception is correct.

4.3 Methods and practices adopted in transforming to learning organization

The theme represents the management style and methods adopted by sample organization in transforming to learning organization. Findings of interview and document data analyses are presented in Table 4.

Management style is an important component in establishing learning capabilities throughout the organization. A hierarchic structure with strict boundaries is a barrier preventing the information to be distributed within the organization rapidly. According to the findings, an open culture prevails in the organization, although it has a loose hierarchical structure. Executives that were involved in the decision-making process stated that management practices do not depend on a chain of command and a strict bureaucracy. Hence, every member of the organization respects each other and communicates relevantly. This kind of management style drives we-oriented culture, encourages employees to articulate their ideas freely and allows them to decide on their way of doing business. Following statements of an executive support these findings:

Our management style is that we do business with the motto “there is something to learn from anybody”. Every opinion is important for us. We ask our friends to give their opinions all the time. it is free for everybody work in the company to express their creative opinions to me, the boss, directly. It is very valuable and important for us and we always emphasize this. We ask them to talk to us when they think that they have a good opinion about our project or about any part of our company. They do so, too. We manage the process like this.

Table 4.
Findings on
“methods and
practices adopted in
transforming to
learning
organization”

Categories	Methods and practices adopted in transforming to learning organization			
	Interview analysis		Document analysis	
	Codes		Categories	Codes
Management practices	–Articulating ideas freely –we-orientation –Transparency –Learning from every member –Relevant communication –Participation		Support of top management	–Motivating –Encouraging self-improvement
Gathering information	–Following the leader –Customer survey –Communicating with service/product providers –Product analyses –Archive –Database		Team activities	–Shared success –Participation
Training	–Personal counseling –Trainings provided by service/product provider –Online courses –Trainings on new products			
Continuous learning	–Internal activities –Rewarding –Training each other –Continual reinforcement			

From the point of gathering information, participants mentioned that they consider their future competitors or leader IT firms rather than their current competitors to acquire information. The organization conducts face-to-face and online surveys with their customers for both gathering information and providing customer satisfaction. They analyze these questionnaires later and make some arrangements depending on the situation. They also mentioned that they negotiate and conduct product analyses with the providers of the tools they use such as equipment, hardware and software. The organization prefers appropriate methods to collect data. Doing this, as it is the first stage of organizational learning, ensures a healthier development of the ongoing process.

Another practice that the organization gives importance to is employee training. The crucial point in answers is that the company works with professionals on training, and it uses this training for institutionalizing organizational processes. The company cares for personal development as well. It enables employees to receive self-improving trainings so that they can conduct their performance better and explore their abilities.

As a result of content analysis, the codes “intra-firm activity,” “rewarding,” “training among employees” and “continual reinforcements” were defined, and these codes were examined under the category of “making the learning permanent.” This category is in accordance with the “organizational memory” stage of organizational learning process. Organizational activities such as meals with families and rewarding have been organized to support and maintain training of employees. In addition, employees explained that they take duties, in turn, to implement what was learnt during trainings. In this way, the organization can maintain an ongoing learning process.

According to document analysis, we obtained the codes “high motivation,” “training programmes,” “promoting development” and “productive environment,” and we gathered these codes under the category of “organization contribution.” In the documents, it is mentioned that the employees try to improve their expertise area and capacity through continual training in addition to their current job. The company considers the development of each employee as the development of the company and motivates employees by encouraging them to develop. As the company considers the training of each employee as the training of the company, we can say that learning has been provided both individually and as the whole company. This finding indicates that organization adopt a “team learning” practice which is one of the five disciplines of learning organization. And in the documents, we found the codes “sharing the success” and “productive environment” and linked them to “team activities.” These findings support the findings of interview analysis.

4.4 Usage of big data

The theme represents how organizations use big data in business processes and, in turn, get business value. The components of the theme are presented in [Table 5](#).

As seen in [Table 5](#), the organization uses big data in departments of organizations to achieve organizational aims and take precautions, make anticipations, make planning and adapt to changes based on big data. One of the participants answered the question “how can the big data be used in reaching the goals?” as follows:

We benefit from big data to reach our goals in this way: For instance, from the lens of accounting, when you look at the financial big data after the analyses, we examine and compare the profits of our businesses as manufacture security cameras systems, server systems, alarm systems. We examine which of them is profitable for us. When we get less profit, we research the reason. From the data, we learn which of them needs more labor. By analyzing we try to find out why we spent so much labour for that department. We draw conclusions and according to them we make corrections in that department related to that labour and part. By using the data, for example, that department may be suffering a gradual loss of income, we search for the reason of the loss and try to find out how we can gain profit at that department. We make them reach conclusions.

Table 5.
Findings on “usage
of big data”

Categories	Big data usage			
	Interview analysis		Document analysis	
	Codes	Categories	Codes	
Achieving aims	–Profit/Loss analysis –Process management –Gathering information about projects –Team leading –Learning	Technological products/services	–Infrastructure services –Software services	
Usage areas	–Accounting –Sales –Recording current transactions –Human resources –Customer relationship –Machine learning	Smart products/services	–Smart buildings –Remote control systems	
Acting based on big data	–Taking precautions –Planning –Adaptation –Anticipation			

We also found that the organization can run the business without referring to customers by using big data. They record current customer accounts, current cards, the products and services which were sold, accounting and sales activities, business hours, entrance and exit hours, payments and the trainings of the employees and the policies about the company.

Moreover, the organization uses big data in performing feasibility planning studies so as to reach the future targets. Participants emphasized that they consider questions such as “What did we do?”, “Did we achieve our goal?”, “What can we do now?” and “What can we do in the future?” and make predictions based on big data. According to interview analysis findings, we can say that the sample organization uses big data in correct areas.

As a result of the document analysis, we found that the organization provides infrastructure services such as cloud server and backup, data storage and backup and alternative energy solutions. In providing these services, although it is not mentioned clearly in documents, the organization uses big data. We came to this conclusion with the support of interview findings. We found concepts in document and interview data that point out that services have been performed with the help of big data solutions in the organization. The facts that the IT firm hosts a Web page, its operation area is technology and it provides technological solutions are the proofs that it uses big data even if it is not mentioned clearly in the documents. Besides, we found in the document analysis that the organization provides smart building, smart home and market automation solutions. These services provide data flow to customer organizations or individuals and, in turn, may contribute to other organizations to improve their learning skills.

4.5 “A learning IT organization” and “organization from customer’s eye”

The theme “A learning IT organization” is formed according to interview data to examine benefits of “big data” through learning organization capabilities. The categories and codes linked to this theme is presented in [Table 6](#).

Under this theme, at first, we examined the requirements of being a learning organization in the IT sector. According to the findings, a company should have a technology department to benefit from big data and to provide learning culture established within the company. Participants stated that companies operating in the IT sector are advantageous in this manner. They emphasized that being aware of the advantages of big data and adapting to change are crucial factors and also a requirement. They pointed out that big data is produced entirely by software, and IT firms should definitely develop software to improve and accelerate their processes in the future; otherwise, they would disappear. The participants listed the values of big data as taking measures in case of facing a problem or beforehand, predicting the needs of the customers or company, being prepared for unexpected situations, providing customer satisfaction and errorless feedbacks by using big data. When we asked participants to evaluate big data from the lens of a learning organization, they stated that they were intertwined with the big data as an IT firm and because of that they could easily transform the processes into data and information, then host it on online platform and share the information among employees.

For the document analysis, we formed the theme “Organization from customer’s eye,” because majority of document data was based on customers’ opinions about company. In these data, we searched for concepts that support that the sample organization is a learning IT firm. The findings of document analysis are presented in [Table 7](#).

The effect of big data

A learning it organization Interview analysis findings	
Categories	Codes
Requirements	–IT department –developing software –Artificial Intelligence –Tech Company
The function of BD in a learning organization	–Dataization –Knowing culture –Researching –Reporting

Table 6.
Findings on “a learning IT organization”

Organization from customers’ eye Document analysis findings	
Categories	Codes
Superiorities	–Providing cutting-edge tech solutions –Optimum cost –Fast technical support –On-time delivery –Correct solutions
Customer satisfaction	–Professional –Trustworthy –References –Customer-oriented

Table 7.
Findings on “organization from customers’ eye”



According to the document analysis, we found why customers preferred the company. The customers preferred to do business with the company because of its superiority in technical areas such as it provides on-time delivery, optimum cost and fast technical support. We found that fostering a learning culture and using big data for this purpose drive customer satisfaction. The organization is a customer-oriented IT firm and gives great importance to customer satisfaction. Findings on interview data also support these findings such that participants mentioned that they contact the customers to understand their satisfaction levels. Besides, in the document analysis, we found a customer satisfaction questionnaire on the Web page of the organization. Hence, document and interview analysis findings support each other in a way that the organization fosters a learning culture by using big data.

In this section, we have presented findings of interview and document data analysis under five main themes. A brief overview of the findings is illustrated in [Figure 1](#).

5. Discussion

In this research, we examined the effect of big data on the transformation process of an IT firm to a learning organization. We found that the organization always renews itself, develops new systems to handle with diverse situations they encounter, continually collects new data and shapes its attitudes in accordance with the data. According to [Garvin \(1993\)](#), a learning organization can acquire and create data, transfer the information through the organization and change its attitudes/behaviors in a way that would reflect new information and insights. Our findings show that the sample organization’s perception of learning organization concept is in accordance with [Garvin’s \(1993\)](#) in terms of acquiring data, implementation and change. We also found that three fundamental features of big data – 3V: high velocity, high volume and high variety – are understood clearly by participants.

According to findings, an open and encouraging culture prevails in the company and a flat participative management style is adopted. This management style eases the information flow through the organization. Besides, the organization gives importance to the training of employees about new products and services and also provides personal counselling services to the employees. Moreover, the organization provides a climate in which the employees can train each other. The knowledge acquired from trainings is implemented by turns; hence, employees can learn by observing and doing, and then, they can train the others. This is an important practice in establishing a learning culture in the organization.

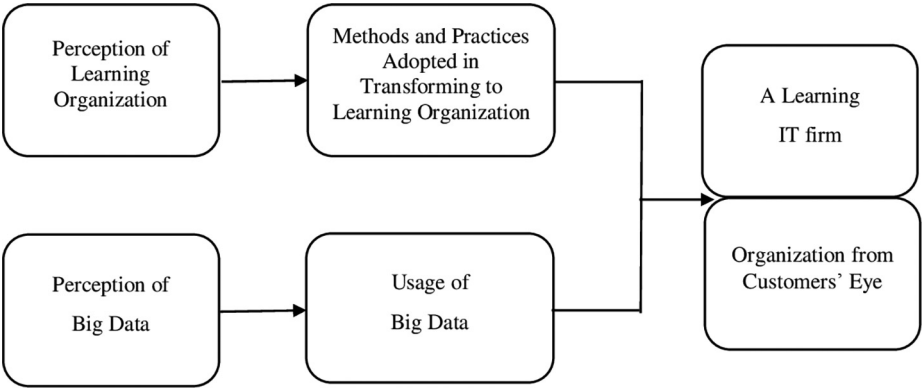


Figure 1.

The organization gets value from processing big data and in areas where big data is used. Organization provides technological solutions to the customers and uses big data in every level of organization and acts based on big data in achieving organizational aims.

Another important finding, the theme titled *Learning IT organization*, represents requirements for being a learning organization and contribution of big data in establishing a learning culture. A separate IT department, developing its own software to process data, operating in the IT sector and using artificial intelligence tools to process big data were defined as fundamental requirements. Participants' statements indicate that the organization is intertwined with big data and convert business processes into data easily. Researching constantly and reporting are established activities in the company.

The organization also uses big data in establishing a learning culture from the customers' perspective. Customers prefer doing business with the organization for its superiorities such as customer-oriented approach, cutting-edge solutions, on-time delivery and fast technical support. We found that the learning culture facilitates customer satisfaction and big data plays an important role in achieving this.

Consequently, the sample organization is a learning organization, as it gives importance to training, develops new systems, ensures the freedom of thought without considering titles, uses a wide range of sources to collect data, follows the developments in the sector consistently, provides team learning successfully and supports the idea that every employee in the organization should learn what has learnt and the company operates in the scope of these ideas. The IT firm benefits from big data in gaining experience about the past, achieving the goals, making predictions about the future, making strategical plans and taking actions, developing their own software to manage the organizational operations better, finding solutions for the customers' needs and exploring new products and services.

5.1 Theoretical implications

Our research contributes to literature in a way that studies on big data and learning organization concepts generally use OLT's components to develop research models that examine the influence of big data or BI systems on gaining business value, innovation capability or organizational performance (Bordeleau *et al.*, 2020; Fuchs, 2017; Ghasemaghahi and Calic, 2019a, 2019b). In this research, we focused on how big data affect an organization's transforming process to a learning organization, specifically to a learning IT organization. In this respect, our research contributes to literature which proposes that big data has a significant effect on establishing a learning culture in organizations (Poletto *et al.*, 2017; Le Dinh, *et al.*, 2018; Jenkin, 2013). We expect that our findings would shed light on future research to focus on this aspect of the phenomenon.

5.2 Practical implications

Our research also contributes to practitioners in the sector as it examines the business processes of the sample organization in depth. Findings suggest recommendation to SMEs operating in the IT sector and considering transforming into a learning organization.

6. Conclusions and limitations

In this paper, we examined the effect of big data in transforming to a learning organization. To do this, we studied on a sample organization operating in the IT sector in Düzce province, Turkey. We followed a single case study design and gathered data by conducting interviews with employees of the organization and document analysis. At first, we defined the perception of learning organizations and big data concepts of the organization. Then, we focused on how big data provide value to business, in what areas it is used and examined

methods and practices adopted by the organization in establishing a learning culture. And we evaluated the facts how the sample organization can be defined as a learning organization that has been using big data in transforming to learning organization and for maintaining the learning culture. Consequently, as a result of research, we presented answers for the following research questions:

RQ1. Which processes does an IT firm go through in transforming to a learning organization?

We presented findings on this research question under the theme entitled “Methods and practices adopted in transforming to learning organization” that are management practices, gathering information, training, continuous learning, support of top management and team activities.

RQ2. How does big data influence an IT firm’s transformation process to a learning organization?

The themes “Usage of big data,” “A Learning IT organization” and “Organization from customers’ eye” give answers for this research question. The organization uses big data in achieving organizational goals such as in profit/loss analysis, process management, gathering information about projects, team leading and establishing learning culture. Big data is used in many areas in the organization (e.g. accounting, sales and customer relationship) for taking precautions, planning, adaptation and anticipation. The organization stores business processes as data (i.e. dataization), keeps on researching, follows technological improvements and tech leader companies, provides data flows and, in turn, transfers information through the company. From the viewpoint of customers, thanks to the big data, the organization follows a customer-oriented strategy, produces customized services and provides cutting-edge tech solutions at optimum cost.

Our findings show that the sample organization is a learning IT organization that uses big data in establishing a learning culture. To our knowledge, this is one of the first research that examines the effect of big data in transforming to a learning organization. However, this research has some limitations which are as follows:

- *Sample limitation:* In this research, we examined a SME operating in the IT sector, in Düzce province, Turkey. Hence, our findings may be specific to the sample organization. More research is needed to understand the influence of big data in the transformation process. Future research could choose sample organization(s) in different regions, sectors and scales.
- *Method limitation:* In this research, we followed a single case study design. Hence, we focused on a single company. Future research could follow a multiple case study approach and compare the common and diverse points in the transforming process. We used qualitative interview and document analysis as data collecting method. Future research could use participant observation and field notes as data gathering method. Participating in daily business of the organization could support interview and document data. In the data analyzing process, we applied deductive qualitative content analysis to the data. We searched pre-defined themes in the data. Future research could follow an inductive method and allow new concepts to emerge from the data. Grounded theory design may reveal concepts and relationships that have not been issued in the literature yet.

References

- Agrawal, D., Bernstein, P., Bertino, E., Davidson, S., Dayal, U., Franklin, M., Jagadish, H.V. (2011), "Challenges and opportunities with big data 2011-1", Cyber Center Technical Reports, Paper I, available at: <http://docs.lib.purdue.edu/cctech/1> (accessed 5 May 2021).
- Arefin, M.S., Hoque, M.R. and Rasul, T. (2020), "Organizational learning culture and business intelligence systems of health-care organizations in an emerging economy", *Journal of Knowledge Management*, Vol. 25 No. 3, pp. 573-594.
- Argyris, C. (1977), "Double loop learning in organizations", *Harvard Business Review*, Vol. 55 No. 5, pp. 115-125.
- Argyris, C. (1995), "Action science and organizational learning", *Journal of Managerial Psychology*, Vol. 10 No. 6, pp. 20-26.
- Avcı, U., Kılınc, İ. and Okumuş, F. (2010), "Öğrenme düzeyleri arasındaki ilişki", otel işletmelerinde bir alan araştırması [Relationship among learning levels: an investigation in hotel companies], *Ege Academic Review*, 10 1, pp. 95-115.
- Bhatt, G.D. and Zaveri, J. (2002), "The enabling role of decision support systems in organizational learning", *Decision Support Systems*, Vol. 32 No. 3, pp. 297-309.
- Bontis, N., Crossan, M.M. and Hulland, J. (2002), "Managing an organizational learning system by aligning stocks and flows", *Journal of Management Studies*, Vol. 39 No. 4, pp. 437-469.
- Bordeleau, F.E., Mosconi, E. and de Santa-Eulalia, L.A. (2020), "Business intelligence and analytics value creation in industry 4.0: a multiple case study in manufacturing medium enterprises", *Production Planning and Control*, Vol. 31 No. 2-3, pp. 173-185.
- Brown, B. Chui, M. and Manyika, J. (2011), "Are you ready for the era of 'big data'", McKinsey Quarterly, October, available at: www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/are-you-ready-for-the-era-of-big-data (accessed 5 May 2021).
- Buechel, B. and Probst, G. (2000), "From organizational learning to knowledge management", available at: <http://archive-ouverte.unige.ch/unige:5858> (accessed 5 May 2021).
- Cackett, D. (2013), *Information Management and Big Data: A Reference Architecture*, Oracle: Redwood City, CA.
- Castellano, N., Presti, C. and del Gobbo, R. (2017), "Employing big data and analytics in decision-making: factors affecting managers' trustworthiness", The European Conference on Information Systems Management. Academic Conferences International Limited. pp. 37-46.
- Creswell, J.W. (2007), *Qualitative Inquiry and Research Design: Choosing among Five Approaches*, (2nd edition), SAGE Publications, New York, NY.
- Creswell, J.W. (2012), *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research*, (4th edition), Pearson Education Inc., London.
- Crossan, M.M., Lane, H.W. and White, R.E. (1999), "An organizational learning framework: from intuition to institution", *The Academy of Management Review*, Vol. 24 No. 3, pp. 522-537.
- Davenport, T.H. Barth, P. and Bean, R. (2012), "How' big data is different", MIT Sloan Management Review, July 30, available at: <https://sloanreview.mit.edu/article/how-big-data-is-different/> (accessed 5 May 2021).
- Edmondson, A.C. (2002), "The local and variegated nature of learning in organizations: a group-level perspective", *Organization Science*, Vol. 13 No. 2, pp. 128-146.
- Edmondson, A.C. and Moingeon, B. (1998), "From organizational learning to the learning organization", *Management Learning*, Vol. 29 No. 1, pp. 5-20.
- Fink, L., Yogev, N. and Even, A. (2017), "Business intelligence and organizational learning: an empirical investigation of value creation processes", *Information and Management*, Vol. 54 No. 1, pp. 38-56.
- Fiol, C.M. and Lyles, M.A. (1985), "Organizational learning", *The Academy of Management Review*, Vol. 10 No. 4, pp. 803-813.

- Fosso-Wamba, S., Akter, S., Edwards, A., Chopin, G. and Gnanzou, D. (2015), "How 'big data' can make big impact: findings from a systematic review and a longitudinal case study", *International Journal of Production Economics*, Vol. 165, pp. 234-246.
- Fuchs, M., Höpken, W. and Lexhagen, M. (2014), "Big data analytics for knowledge generation in tourism destinations – a case from Sweden", *Journal of Destination Marketing & Management*, Vol. 3 No. 4, pp. 198-209, doi: [10.1016/j.jdmm.2014.08.002](https://doi.org/10.1016/j.jdmm.2014.08.002).
- Gartner IT Glossary (2012), "Big data Gartner IT glossary", available at: www.gartner.com/en/information-technology/glossary/big-data (accessed 5 May 2021).
- Garvin, D.A. (1993), "Building a learning organization", Harvard business review, July-August", available at: <https://hbr.org/1993/07/building-a-learning-organization> (accessed 5 May 2021).
- Ghasemaghaei, M. and Calic, G. (2019a), "Can big data improve firm decision quality? The role of data quality and data diagnostic", *Decision Support Systems*, Vol. 120, pp. 38-49.
- Ghasemaghaei, M. and Calic, G. (2019b), "Does big data enhance firm innovation competency? The mediating role of data-driven insights", *Journal of Business Research*, Vol. 104, pp. 69-84.
- Hsieh, H.F. and Shannon, S.E. (2005), "Three approaches to qualitative content analysis", *Qualitative Health Research*, Vol. 15 No. 9, pp. 1277-1288.
- Huber, G.P. (1991), "Organizational learning: the contributing processes and the literatures", *Organization Science*, Vol. 2 No. 1, pp. 88-115.
- Jenkin, T.A. (2013), "Extending the 4I organizational learning model: information sources, foraging processes and tools", *Administrative Sciences*, Vol. 3 No. 3, pp. 96-109, doi: [10.3390/admsci3030096](https://doi.org/10.3390/admsci3030096).
- Kim, D.H. (1993), "The link between individual and organizational learning", MIT Sloan Management Review, October 15, available at: https://sloanreview.mit.edu/article/the-link-between-individual-and-organizational-learning/?gclid=CjwKCAjwhMmEBhBwEiwAXwFoESfvqScvDERcsrfXJxpAUtzlmcB2iCKydjfuAICakJfDwJwJStCs3BoC8PoQAvD_BwE (accessed 5 May 2021).
- Klein, S.B. (2018), *Learning: Principles and Applications*, Sage Publication, Los Angeles, CA.
- Le Dinh, T., Phan, T.C., Bui, T. and Vu, M.C. (2018), "Towards a Service-Oriented architecture for knowledge management in big data era", *International Journal of Intelligent Information Technologies*, Vol. 14 No. 4, pp. 24-38.
- Liao, S.H., Fei, W.C. and Liu, C.T. (2008), "Relationships between knowledge inertia, organizational learning and organization innovation", *Technovation*, Vol. 28 No. 4, pp. 183-195.
- López, S.P., Peón, J.M.M. and Ordás, C.J.V. (2005), "Organizational learning as a determining factor in business competitiveness", *The Learning Organization*, Vol. 12 No. 3, pp. 227-245.
- McAfee, A. and Brynjolfsson, E. (2012), "Big data: the management revolution", Harvard Business Review, October, available at: <https://hbr.org/2012/10/big-data-the-management-revolution> (accessed 5 May 2021).
- McGill, M.E. and Slocum, J.W. Jr (1993), "Unlearning the organization", *Organizational Dynamics*, Vol. 22 No. 2, pp. 67-79.
- Marquardt, M.J. (2011), *Building the Learning Organization: Mastering the Five Elements for Corporate Learning*, Hachette, New York, NY.
- Mavondo, F.T., Chimhanzi, J. and Stewart, J. (2005), "Learning orientation and market orientation: relationship with innovation, human resource practices and performance", *European Journal of Marketing*, Vol. 39 No. 11/12, pp. 1235-1263.
- Mazzei, M.J. and Noble, D. (2017), "Big data dreams: a framework for corporate strategy", *Business Horizons*, Vol. 60 No. 3, pp. 405-414.
- Miele, S. and Shockley, R. (2013), "Analytics: the real-world use of big data", IBM Global Business Services Business Analytics and Optimization, Executive Report available at: www.informationweek.com/pdf_whitepapers/approved/1372892704_analytics_the_real_world_use_of_big_data.pdf (accessed 5 May 2021).

-
- Negash, S. (2004), "Business intelligence", *Communications of the Association for Information Systems*, Vol. 13 No. 15, pp. 177-195.
- Obeso, M., Hernández-Linares, R., López-Fernández, M.C. and Serrano-Bedia, A.M. (2020), "Knowledge management processes and organizational performance: the mediating role of organizational learning", *Journal of Knowledge Management*, Vol. 24 No. 8, pp. 1859-1880.
- Poleto, T., Heuer de Carvalho, V.D. and Costa, A.P. (2017), "The full knowledge of big data in the integration of inter-organizational information: an approach focused on decision making", *International Journal of Decision Support System Technology (Technology)*, Vol. 9 No. 1, pp. 16-31, available at: <http://doi.org/10.4018/IJDSST.2017010102>
- Reinsel, D. Gantz, J. and Rydning, J. (2018), "Data age 2025: the digitalization of the world from edge to core", IDC White Paper (#US44413318), November, Seagate, available at: www.seagate.com/files/www-content/our-story/trends/files/idc-seagate-dataage-whitepaper.pdf (accessed 5 May 2021).
- Santos-Vijande, M.L., López-Sánchez, J.Á. and Trespalacios, J.A. (2012), "How organizational learning affects a firm's flexibility, competitive strategy, and performance", *Journal of Business Research*, Vol. 65 No. 8, pp. 1079-1089.
- Senge, P.M. (1994), *The Fifth Discipline: The Art and Practice of the Learning Organization*, Currency Doubleday, New York, NY.
- Škerlavaj, M., Štemberger, M.I. and Dimovski, V. (2007), "Organizational learning culture-the missing link between business process change and organizational performance", *International Journal of Production Economics*, Vol. 106 No. 2, pp. 346-367.
- Slater, S.F. and Narver, J.C. (1995), "Market orientation and the learning organization", *Journal of Marketing*, Vol. 59 No. 3, pp. 63-74, doi: [10.1177/002224299505900306](https://doi.org/10.1177/002224299505900306).
- Simon, H.A. (1991), "Bounded rationality and organizational learning", *Organization Science*, Vol. 2 No. 1, pp. 125-134.
- Stata, R. (1989), "Organizational learning: the key to management innovation", *Sloan Management Review*, April 15, available at: <https://sloanreview.mit.edu/article/organizational-learning-the-key-to-management-innovation/> (access 5 May 2021).
- Ward, J.S. and Barker, A. (2013), "Undefined by data: a survey of big data definitions", available at: www.adambarker.org/papers/bigdata_definition.pdf (accessed 6 May 2021).
- White, M. (2012), "Digital workplaces: vision and reality", *Business Information Review*, Vol. 29 No. 4, pp. 205-214.
- Wilder-James, E. (2012), "What is big data? An introduction to the big data landscape", O'Reilly Media, available at: www.oreilly.com/radar/what-is-big-data/ (access 5 May 2021).

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