Big Data Adoption and Knowledge Management Sharing to Organizational Intelligence

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ABSTRACT: *This paper proposes a theoretical model that links organizational intelligence with big data adoption factors and knowledge management sharing factors in an organizational environment and applies the Technology-Organization-Environment Framework: TOE. The model consists of three dimensions which are (1) the technological dimension: relative advantage, complexity, and compatibility, (2) the organizational dimension: top management support, organizational data environment, and organizational readiness, and (3) the environmental dimension: government regulation and policy and external pressure. Besides, the knowledge management sharing factor emphasizes age diversity, cultural diversity, and organizational sharing culture. This study focuses on the relationship between big data adoption factors and knowledge management sharing factors influencing organizational intelligence. This theoretical model is appropriate for conducting survey research to analyze data and plan strategies at the organizational level for organizational intelligence.*

Keywords: big data, big data adoption, knowledge management sharing, organizational intelligence

1. Introduction

Nowadays, many organizations apply digital transformation to all sectors of the organization. Therefore, this may cause changes in foundations, goals, work processes, and organizational culture, which is a strategic transformation of an organizational model to increase efficient operation (Abad-Segura, Gonzalez-Zamar, & Infante-Moro, 2020). With these changes, data plays a significant role in the organization's decision-making. Because it will increase operational efficiency, better business decision-making, improve customer experience and engagement, and reduce costs and expenses of the organization. (Poshyanonda, n.d.). Each organization attempts to collect data in various forms, causing the amount of increasing data enormously. The increasing amount of big data has features of enormous volume, velocity, variety, veracity, and value. It is structured, unstructured, and semi-structured data that come from various sources (Pratsri & Nilsook, 2020). As a result, traditional data architectures cannot handle big new data effectively. Therefore, big data technologies and scalable architectures for efficient storage, management, and analysis are necessary (Dahdouh et al., 2018) in supporting organizations. The application of big data technology in an organization will change the operation and sharing of information across the organization. This is a challenge for organizations to support and encourage employees to accept big data adoption and knowledge sharing within the organization (Khurshid et al., 2019). This is because the organization's ability to accept big data adoption and knowledge sharing has great potential to reduce costs, promote competitive advantage, and sustainable development (Al-Rahmi et al., 2019) for the transformation of organizational intelligence. For effective knowledge sharing, personnel should be encouraged to

share their knowledge with their colleagues. Knowledge sharing and organizational expertise increase the efficiency and effectiveness of the organization and achieve a competitive advantage (Mirzaee & Ghaffari, 2018). Furthermore, intelligence is important in every organization. It shows the ability to solve organizational problems, which is an emphasis on the integration of technical ability, technology, and human ability to solve problems. In addition, it includes integrating information, experiences, and knowledge to understand organizational problems and find a new way of technology adoption that contributes to the development and strengthening of the organization (Awamleh & Ertugan, 2021).

From the importance mentioned above, it is challenging to study the relationship between big data adoption factors and knowledge management sharing factors influencing organizational intelligence to drive an organization effectively. Furthermore, the paper is also developing a theoretical model based on TOE framework that links organizational intelligence with big data adoption factors and knowledge management sharing factors in the organizational environment.

2. Literature Review

Big Data

Big data is a large amount of data existing in the organization, whether from internal or external sources. It is an important innovation that has attracted the attention of academics and practitioners (Baig, Shuib, & Yadegarudehkorde, 2020). The data comes from various sources, such as social media messages, weather information, GPS signals, purchase transaction records, and activities on the internet. This is consistent with (Ratra & Gulia, 2019) stated that big data is a set of techniques that enable the integration to expose many unknown values. These values are very complex and gigantic that may be structured and unstructured. It's hard to manage this data with the basic tools and techniques. So excellent processing with analytical capabilities is required (Attaran et al., 2018). Many researchers define the characteristics of big data (Pratsri & Nilsook, 2020), (Dahdouh et al., 2018), (Hanapiyah, Wan Hanafi, & Daud, 2018), (Songsangyos & Nilsook, 2015), (Saggi & Jain, 2018) consisting of five characteristics, also known as 5 V: Volume, Variety, Velocity, Veracity, and Value. Volume refers to a large amount of data or the increasing size of the data, so it cannot be stored in the database system. This is due to the collection and analysis of large amounts of structured and unstructured data from various sources in the organization. Variety refers to various data formats, types, sources, or different data made by people or machines. It concludes structured, semi-structured, and unstructured type. Velocity refers to the speed of data from databases and data processing, which is fast, continuous, and up to date. It can analyze the results of decision-making and timely response. In addition, many researchers further identify the characteristics of big data (Khan & Alqahtani, 2020), (Marín-Marín et al., 2019), (Baig, Shuib, & Yadegarudehkorde, 2021), (Hajjaji et al., 2021). Veracity refers to the accuracy and clarity of data. The accuracy of the data should include the reliability of data sources. The data gathered in the organization must meet the quality standards and provide accurate results that lead to appropriate operation, especially in key decision making. Value is an important characteristic because it creates an advantage in business data and business decision-making. It includes the value of data advantages for organizational operation such as data analysis for summary and data analysis for planning and developing strategies or increasing competitiveness.

Table 1. Synthesis of big data

Topic	Concept	Example of Characteristics	Reviews
Big Data	A large amount of data, large volume or high speed and variety, which may be structured or semi-structured or unstructured data. These data are too large to be easily manipulated and flow in and out at too much speed. This makes it difficult to analyze and process. New architectures, techniques, algorithms, and analyses are required to manage and extract hidden values and knowledge.	- Volume - Velocity - Variety - Value - Veracity	(Anil, 2018), (Attaran, Stark, & Stotler, 2018), (Baig, Shuib, & Yadegarudehkorde, 2021), (Chinsook et al., 2022), (Dahdouh et al., 2018), (Hajjaji et al., 2021), (Hanapiyah, Wan Hanafi, & Daud, 2018), (Hwang, 2019), (Khan & Alqahtani, 2020), (Marin-Marin et al., 2019), (Ratra & Gulia, 2019)

Table 1 shows that the characteristics of big data consist of five components: Volume, Velocity, Variety, Value, and Veracity. From such characteristics, big data can be applied to an organization or various missions. The use of big data is divided into two reasons: (1) analytical applications: analyzing enormous data to obtain hidden knowledge; and (2) enabling new products: big data can be used to create products or improve services (Songsangyos & Nilsook, 2015). Additionally, organizations can use big data to improve their works and services and organizational operations, leading them to an advantage, helping personnel and organizations to identify their successes and weaknesses, and comparing with other organizations for a competitive advantage. In accordance with (Hanapiyah, Wan Hanafi, & Daud, 2018) indicates that for educational organizations, big data provides an opportunity for strategic use of information technology resources to improve the quality of education and help students achieve higher success rates. Moreover, the concepts of big data and its potential applications can be used to develop educational technology and innovation. Digital learning platforms and e-learning platform that apply aspects of big data is powerful online instruction tool (Pratsri & Nilsook, 2020). In accordance with (Khan & Alqahtani, 2020) indicates that using big data and its potential characteristics to create different types of applications for educational data mining may provide educational sectors to be smarter.

Big Data Adoption
Big data adoption is a process that enables innovation to transform an organizational infrastructure, brings multiple benefits, and increases the overall efficiency of the organizational infrastructure and technology (Baig, Shuib, & Yadegaridehkordi, 2021). Big data adoption supports a data-driven decision-making culture. This is useful in enhancing the ability of personnel. The organizational personnel will be active while making decisions, resulting in effective decision-making and satisfaction for the organization (Nisar et al., 2020). Competitive pressure affects the organizational motivation to produce or invent innovation. Big data adoption decreases such competitive pressures by creating a pricing strategy and immediate results (Baig, Shuib, & Yadegaridehkordi, 2019). Big data adoption is essential for the education sector as it creates competitive advantages, for example increasing an educational management's ability to meet future needs (Mukred et al., 2021). In summary, big data adoption is a process that enables innovation to transform the organizational infrastructure. It includes advanced data processing techniques and technologies that improve decision-making processes. Furthermore, it creates opportunities for organizations to leverage data and gain a competitive advantage. Innovation acceptance research, which is mainly related to the adoption of technology and information systems, has formed various models to study adoption.

(1) Technology Acceptance Model: TAM
Technology Acceptance Model originated from the Theory of Reasoned Action: TRA, used in the study of technology acceptance, which consisted of two main parameters: perceived usefulness and perceived ease of use (Mustafa & Garcia, 2021). Both parameters affect attitude toward using and behavior intention to use. The perceived usefulness refers to beliefs by individuals that using technology will improve their performance efficiency. Besides, perceived ease of use refers to the way that individuals believe that using a particular system would be easy and uncomplicated (Mohamad, Amran, & Md Noh, 2021). Technology Acceptance Model represents the relationship between external variables that affect user acceptance of technology and factors that affect actual behavior. The theory hypothesizes the relationship between external variables and both perceived usefulness and perceived ease of use and can also predict factors affecting technology adoption (Hong & Yu, 2018).

(2) Diffusion of Innovations: DOI
Diffusion of Innovations is a theory that is widely used to describe the diffusion process of innovation (Khurshid et al., 2019), which was proposed by Rogers in 1962 and developed later. This theory explains the concept of the innovation process. It states that innovation adoption decision is influenced by five elements: relative advantage, compatibility, complexity, trialability, and observation (Baig, Shuib, & Yadegaridehkordi, 2021). The process of diffusion technology is therefore associated with a specific ability to solve technical problems, internal organizational structure, external organization characteristics, and leaders' attitudes towards change. Therefore, innovation and organizational characteristics contribute to the new technology adoption (Sun et al., 2018).

(3) Technology-Organization-Environment Framework: TOE
Technology-Organization-Environment Framework is a multidisciplinary conceptual framework. It provides an in-depth analysis of the factors and components that affect big data adoption. It consists of three main factors: the technological factor, which covers all internal and external technologies; organizational factor, and environmental factor (Baig, Shuib, & Yadegaridehkordi, 2021). Technological factor includes equipment, necessary process, internal

and external technological innovation, and support of organizational resources (Cruz-Jesus, Pinheiro, & Oliveira, 2019). Organizational factor refers to the resources and other characteristics of the organization, such as organizational size and structure, human resource management structure, and employee skills and experiences (Lutfi et al., 2022), while the environmental factor covers business partners and competitors of the organization, macroeconomic context, and elements of market (Saetang, Tangwannawit, & Jensuttiwetchakul, 2020). The three factors of the organization will stimulate and influence decision-making to adopt technological innovation (Petersen & Nguyen, 2017). Technology-Organization-Environment Framework is a part of the innovation process. The context of the framework influences the adoption and implementation of innovations. It is a clear framework for evaluating the adoption of technological innovations within different types of organizations. It differs from other theories and presents only different sources of influence without specifying variables in each context (Sam & Chatwin, 2019). As a result, this paper applies the Technology-Organization-Environment Framework to explain big data adoption.

Technological factors
(1) Relative advantage
Relative advantage is the level to which organizations benefit from big data adoption. Moreover, it is the level where technology adoption is essential to other technologies in the organization (Lutfi et al., 2022), such as competition and good business solutions. Relative advantage is a key factor positively influencing the adoption of innovative services in an organization (Baig, Shuib, & Yadegaridehkordi, 2019). In addition, it is also the level to which big data technologies are seen as providing greater benefits to organizations than previous technologies. Big data technology can help organizations in many aspects, such as collecting large volumes of data, high speed data, and flexible data processing (Saetang, Tangwannawit, & Jensuttiwetchakul, 2020).
(2) Complexity
Complexity is the characteristic of big data that is difficult to understand and use (Baig, Shuib, & Yadegaridehkordi, 2021). New technology or a new system application may fail if they are too complex and difficult to use. Complexity will negatively affect the adoption of technology. Due to the uncertainty brought by complex technology, complexity is important for personnel to understand innovation at an appropriate time (Lutfi et al., 2022). Therefore, complexity is an inevitable obstacle to big data adoption.
(3) Compatibility
Compatibility is the characteristic of big data that is consistent with the existing technology architecture in an organization. It is a level of recognition that the technology is reliable and meets the users' needs, such as scalability and integration with existing information systems (Sun et al., 2018). Compatibility can be considered in two dimensions. The first dimension is normative compatibility or understanding, such as what the user accepts, feels, or thinks about innovation. Another dimension is operational compatibility (Petersen & Nguyen, 2017). Compatibility plays an important role in increasing innovative technology adoption (Baig, Shuib, & Yadegaridehkordi, 2021), (Pivar, 2020).

Organizational factors
(1) Top management support
Top management support is a basic factor to create an environment, support, and providing sufficient resources for new technology adoption (Sekli & De La Vega, 2021), (Mukred et al., 2021). It is the level at which top management understands the importance, relevance, and benefits of innovation adoption (Saetang, Tangwannawit, & Jensuttiwetchakul, 2020), allocates sufficient resources, and supports big data adoption within the organization (Baig, Shuib, & Yadegaridehkordi, 2021). Top management support is used to study the acceptance of various technological innovations. Especially in terms of technology are positive changes in the organizational processes. This is because top management support is an internal factor that can control the entire strategic planning and decision-making process under innovative technologies (Cruz-Jesus, Pinheiro, & Oliveira, 2019).
(2) Organizational data environment
An organizational data environment is the ability to access data and reduce errors when accessing data. This is because big data is unique from various sources and formats (Sekli & De La Vega, 2021), including information resources controlled by the organization. It should be secured to minimize the risk factors and protect the environment from cybercrime. Organizations should pay attention to appropriate security controls for personal access to information. The definition of sensitive data should be defined in the planning process before big data is implemented (Baig, Shuib, & Yadegaridehkordi, 2019).
(3) Organizational readiness

Organizational readiness refers to the organizational ability to manage and invest in new technology adoption, including information technology capabilities and technical expertise (Sekli & De La Vega, 2021). In accordance with (Lutfi et al., 2022) indicates that the readiness of the organization is the ability and organizational tendency to accept new technology. Many agencies agree that an organization's preparation is necessary for big data adoption.

Environmental factors

(1) Government regulation and policy

Government regulation and policy can be a barrier for organizations to encourage new technologies adoption. With the support and encouragement of government regulations and policies, an organization's adoption may increase (Lutfi et al., 2022), (Lai, Sun, & Ren, 2018). Government regulations and policy are designed to mitigate some issues, such as privacy protection. Organizations can access data without interfering with privacy to get significant benefits from the data. However, be clarified about the use of data before it is used (Baig, Shuib, & Yadegaridehkordi, 2021).

(2) External pressure

External pressure refers to competitive pressure or any influence caused by competitors, industry, or organizational partners on the decision on organizational technology adoption (Petersen & Nguyen, 2017). External pressure is the intensity level of competition in the industrial environment in which the organization operates. Competitive pressure motivates organizations to find competitive advantages by adopting new technologies (Saetang, Tangwannawit, & Jensuttiwetchakul, 2020). In the context of innovative technology, external pressure is related to the pressure level of competitors, which is a key driving force in innovation adoption (Cruz-Jesus, Pinheiro, & Oliveira, 2019), (Mukred et al., 2021), (Baig, Shuib, & Yadegaridehkordi, 2021).

Table 2. Synthesis of big data adoption

Topic	Concept	Example of Models	Reviews
Big Data Adoption	A process that enables innovation to transform an organization's infrastructure. It covers advanced data processing techniques and technologies that improve decision-making processes. It creates opportunities for organizations to leverage data and gain a competitive advantage.	- Technology Acceptance Model: TAM - Diffusion of Innovations: DOI - Technology-Organization-Environment Framework: TOE	(Baig, Shuib, & Yadegaridehkordi, 2019), (Lai, Sun, & Ren, 2018), (Lazazzara & Za, 2020), (Lutfi et al., 2022), (Saetang, Tangwannawit, & Jensuttiwetchakul, 2020), (Sam & Chatwin, 2019), (Sun et al., 2018), (Pivar, 2020), (Verma & Bhattacharyya, 2017)

Table 2 indicates that the conceptual framework and theories of big data adoption consist of three theories: (1) Technology Acceptance Model, (2) Diffusion of Innovations, and (3) Technology-Organization-Environment Framework.

Table 3. Summary of factors according to TOE Framework affecting big data adoption

Category	Factors	References
Technology	(1) Relative advantage	(Baig, Shuib, & Yadegaridehkordi, 2019), (Baig, Shuib, & Yadegaridehkordi, 2021), (Lai, Sun, & Ren, 2018), (Lutfi et al., 2022), (Petersen & Nguyen, 2017), (Saetang, Tangwannawit, & Jensuttiwetchakul, 2020), (Sam & Chatwin, 2019), (Sun et al., 2018), (Wessels & Jokonya, 2021), (Yin, 2015)
	(2) Complexity	(Baig, Shuib, & Yadegaridehkordi, 2019), (Baig, Shuib, & Yadegaridehkordi, 2021), (Lai, Sun, & Ren, 2018), (Lutfi et al., 2022), (Petersen & Nguyen, 2017), (Saetang, Tangwannawit, & Jensuttiwetchakul, 2020), (Sam & Chatwin, 2019), (Sekli & De La Vega, 2021), (Sun et al., 2018), (Wessels & Jokonya, 2021), (Yin, 2015)

Category	Factors	References
	(3) Compatibility	(Baig, Shuib, & Yadegaridehkordi, 2019), (Baig, Shuib, & Yadegaridehkordi, 2021), (Lutfi et al., 2022), (Petersen & Nguyen, 2017), (Pivar, 2020), (Saetang et al., 2020), (Sam & Chatwin, 2019), (Sekli & De La Vega, 2021), (Sun et al., 2018), (Wessels & Jokonya, 2021), (Yin, 2015)
Organization	(1) Top management support	(Baig, Shuib, & Yadegaridehkordi, 2019), (Baig, Shuib, & Yadegaridehkordi, 2021), (Cruz-Jesus, Pinheiro, & Oliveira, 2019), (Lai, Sun, & Ren, 2018), (Lutfi et al., 2022), (Mukred et al., 2021), (Petersen & Nguyen, 2017), (Pivar, 2020), (Saetang, Tangwannawit, & Jensuttiwetchakul, 2020), (Sam & Chatwin, 2019), (Sekli & De La Vega, 2021), (Sun et al., 2018), (Surbakti et al., 2020), (Wessels & Jokonya, 2021), (Yin, 2015)
	(2) Organizational data environment	(Baig, Shuib, & Yadegaridehkordi, 2021), (Petersen & Nguyen, 2017), (Sekli & De La Vega, 2021)
	(3) Organizational readiness	(Lutfi et al., 2022), (Sam & Chatwin, 2019), (Sekli & De La Vega, 2021), (Wessels & Jokonya, 2021)
Environment	(1) Government regulation and policy	(Baig, Shuib, & Yadegaridehkordi, 2019), (Baig, Shuib, & Yadegaridehkordi, 2021), (Lai, Sun, & Ren, 2018), (Lutfi et al., 2022), (Mukred et al., 2021), (Sam & Chatwin, 2019)
	(2) External pressure	(Baig, Shuib, & Yadegaridehkordi, 2019), (Baig, Shuib, & Yadegaridehkordi, 2021), (Cruz-Jesus, Pinheiro, & Oliveira, 2019), (Lai, Sun, & Ren, 2018), (Lutfi et al., 2022), (Mukred et al., 2021), (Petersen & Nguyen, 2017), (Saetang, (Saetang, Tangwannawit, & Jensuttiwetchakul, 2020), (Sam & Chatwin, 2019), (Sekli & De La Vega, 2021), (Sun et al., 2018), (Wessels & Jokonya, 2021), (Yin, 2015)

Table 3 shows that the factors according to the TOE Framework affecting big data adoption presented in this paper are divided into three contexts: (1) Technology: relative advantage, complexity, and compatibility, (2) Organization: top management support, organizational data environment, and organizational readiness, and (3) environment: government regulation and policy and external pressure.

Knowledge Management Sharing
Knowledge management sharing is the creation and transfer of knowledge to transform personal knowledge into organizational knowledge and interact with understanding or knowledge to get a deeper understanding (Murtaza Rafique, Khalid, & Idrees, 2020). Knowledge management relies on the motivation of knowledge sharing. It is necessary to know what motivates team members to share skills or knowledge (Halisah et al., 2020). For effective knowledge sharing, personnel should be encouraged to share their knowledge with their colleagues. Knowledge sharing and organizational expertise increase the efficiency and effectiveness of the organization and achieve a competitive advantage (Mirzaee & Ghaffari, 2018) such as suggestions, skills, expertise, and experience from an individual, group, department, or organization to another (Chión, Charles, & Morales, 2020). Therefore, knowledge management sharing focuses on collecting and disseminating knowledge processes and enabling organizations to learn new problem-solving techniques, create a professional work process, and build core competencies (Muhammed & Zaim, 2020), (Iqbal, 2021).
(1) Age diversity
The problem of age diversity in organizations is becoming more important, especially for the elderly. Therefore, knowledge sharing among different age groups should be encouraged. This is consistent with (Murtaza Rafique, Khalid, & Idrees, 2020) state that age-differentiated teams result in more diverse problem-solving abilities. Integrating and exchanging different perspectives and knowledge leads to more creative problem-solving. Young and middle-aged are courageous and enthusiastic. They have a strong body and wisdom, willing to accept changes to seek new knowledge by sharing ideas and knowledge with colleagues for self-improvement. This leads to effective individual and organizational performance (Murtaza Rafique, Khalid, & Idrees, 2020). On the contrary, experienced seniors are eager to learn and share knowledge and willing to increase their knowledge sharing level: The older the employee, the more dedicated to knowledge sharing (Grzeslo & Gundlach, 2020).
(2) Cultural diversity

Cultural diversity is the difference between groups with explicit cultural backgrounds. Different cultural backgrounds of members can create a framework of a complex culture. These may lead negatively affect knowledge sharing. In addition, cultural differences increase the difficulty of conveying the knowledge (Al-Rahmi et al., 2019). Cultural diversity has a significant impact on knowledge sharing and the long-term success of organizational knowledge management activities (Li, Wu, & Xiong, 2021). Consistent with (Musbah & Adi, 2019), cultural diversity has a negative influence on knowledge sharing processes in multicultural organizations. As a result, the personnel's learning ability is decreased. However, the study (Tomeo & Wang, 2021) implied that there are no barriers and links between cultural diversity and knowledge sharing.

(3) Organizational culture

Organizational culture can be the values and norms in an organization. These include beliefs, feelings, and the process of transferring those values and norms among all members of an organization (Chión, Charles, & Morales, 2020). Organizational culture affects knowledge sharing through three dimensions: collaboration between operators, learning and development, and top management support (Islam, Jasimuddin, & Hassan, 2015). Organizational culture, such as trust, information systems, communication, awards, and organizational structure has a positive influence on knowledge sharing in the academic environment (Le & Tuamsuk, 2021).

Table 4. Synthesis of knowledge management sharing

Topic	Concept	Example of Factors	Reviews
Knowledge Management Sharing	Creating knowledge, transfer, and organizational understanding and skills to transform personal knowledge into organizational knowledge. It plays an important role in knowledge management in the organization and requires motivation to operate and understand what motivates members to share their skills or knowledge. Effective knowledge management sharing drives organizational and individual learning. Moreover, it provides an opportunity for individuals, teams, and organizations to improve performance efficiency and generate new ideas and innovations.	- Age diversity - Cultural diversity - Motivators - Top management support - Organizational culture - Technology - Knowledge sharing intention	(Cruz-Jesus, Pinheiro, & Oliveira,2021), (Fayyaz, Chaudhry, & Fiaz, 2021), (Feili, Dashtipour, & Mousavi, 2021), (Halisah et al., 2020), (Hernández-Soto, Gutierrez-Ortega, & Rubia-Avi, 2021), (Iqbal, 2021), (Keshavarz, 2021), (Lo, Tian, & Ng, 2021), (Mirzaee & Ghaffari, 2018), (Murtaza Rafique, Khalid, & Idrees, 2020), (Sensuse, Lestari, & Hakim, 2021)

Table 4 indicates that factors affecting knowledge management sharing consist of seven factors: age diversity, cultural diversity, motivators, top management support, organizational culture, technology, and knowledge sharing intention.

Organizational Intelligence

Organizational intelligence is a process that provides strategic information to an organization, internal learning process, knowledge management, and a strategic application of technology to generate information and adapt to the workplace and environment (Daoudi et al., 2020), (Altındağ & Öngel, 2021). It links various processes such as adaptation, development, sharing, transformation, learning, and using information appropriate to the purpose of the work. It enables organizations to make decisions about activities and unforeseen situations in a dynamic global environment to achieve the organizational mission (Dumbor Frank et al., 2022), (Sokhtsaraei, 2019), (Kavosi et al., 2021), (Ahmad et al., 2019). An organizational intelligence consists of a strategic perspective, same goal, the need for change, courage, unity and consensus, application of knowledge and performance pressure, and technology application (Diana Andreea & Florica, 2022). Intelligence is important in every organization. It shows the ability to solve organizational problems, which is an emphasis on the integration of technical ability, technology, and human ability to solve problems. Moreover, it includes integrating information, experiences, and knowledge to understand the organizational problem (Awamleh & Ertugan, 2021).

Table 5. Synthesis of organizational intelligence

Topic	Concept	Example of Factors	Reviews
Organizational Intelligence	A process provides strategic information to an organization, internal learning process, knowledge management, and a strategic application of technology to generate information and adapt to the workplace and environment. It links various processes such as adaptation, development, sharing, transformation, learning, and using information appropriate to the purpose of the work. It enables organizations to make decisions about activities and unforeseen situations in a dynamic global environment to achieve the mission of the organization	- Strategic vision - Shared vision - Tend to change - Passion - Unity and consensus - Knowledge application - Performance pressure - Technology application - Knowledge management - Competence management	(Ahmad et al., 2019), (Altındağ & Öngel, 2021), (Awamleh & Ertugan, 2021), (Daoudi et al., 2020), (Diana Andreea & Florica, 2022), (Dumbor Frank et al., 2022), (Habibzade et al., 2021), (Kavosi et al., 2021), (Sokhtsaraei, 2019), (Tahereh et al., 2021), (Tura & Akbasli, 2022)

Table 5 shows that the organizational intelligence consists of ten components: shared vision, tend to change, passion, unity and consensus, knowledge application, performance pressure, technology application, knowledge management, and competence management.

From document, synthesis and research related to big data, big data adoption, knowledge management sharing, and organizational intelligence, the network clusters are shown in Figure 1.
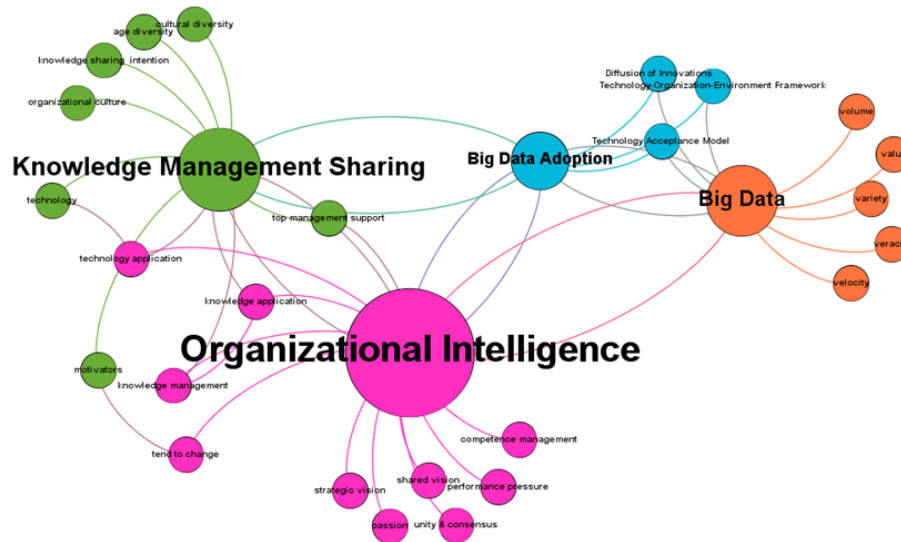

Figure 1. Organizational Intelligence Network Clusters

Figure 1 shows that the Organizational Intelligence network clusters consists of three main clusters: Knowledge Management Sharing, Big Data, and Big Data Adoption. Knowledge Management clusters are the core component, followed by Big Data clusters, and Big Data Adoption clusters, respectively. Moreover, there are small clusters formed by the subsets of each component that are related to each other. This network clusters use an organizational intelligence driver with harmonic closeness centrality, 0.420; organizational intelligence, 0.732; knowledge management sharing, 0.595; big data, 0.547; and big data adoption, 0.500.

3. Theoretical Model

From the study, analysis, and synthesis of big data, big data adoption, knowledge management sharing, and organizational intelligence, can be applied to develop a theoretical model and examine the factors that affect the organization's drives toward the organizational intelligence, as shown in Figure 2.
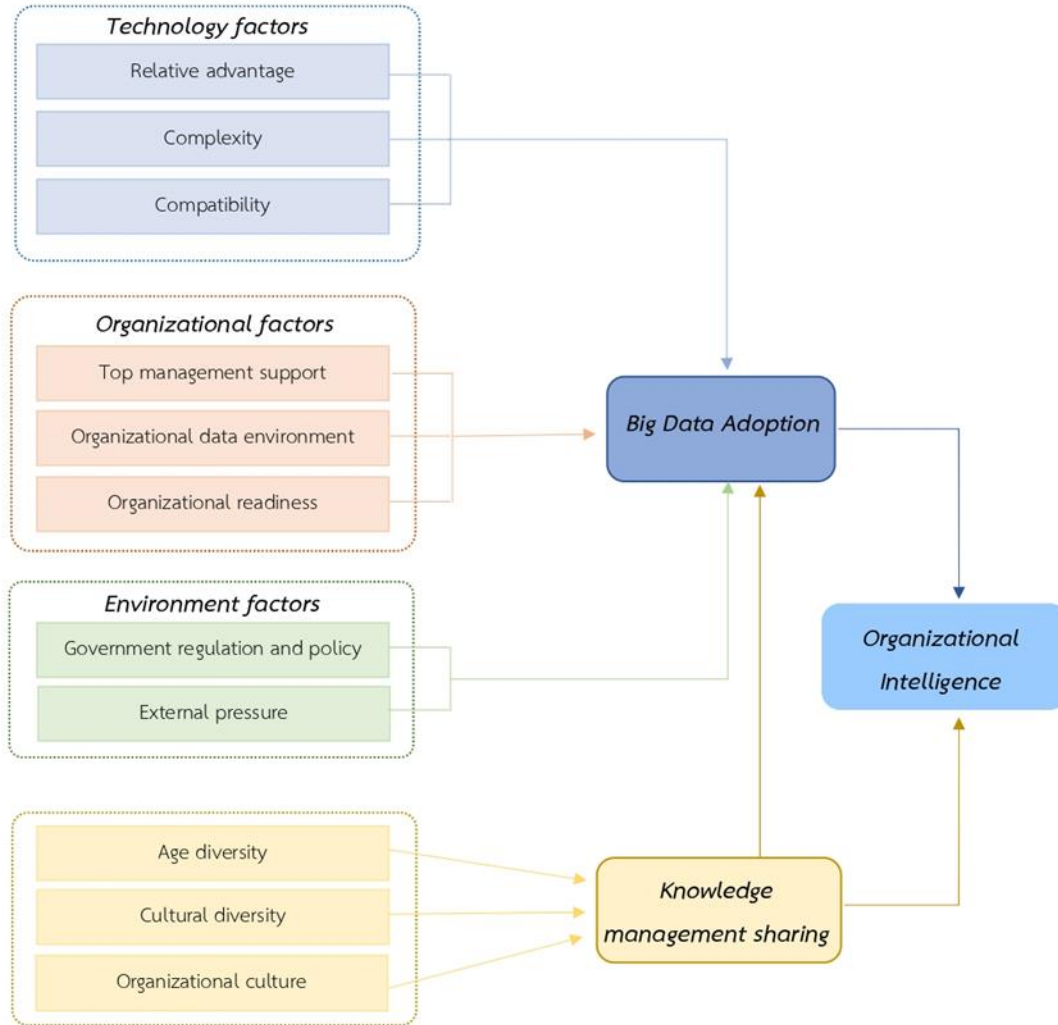

Figure 2. Theoretical Model

Figure 2 shows that the theoretical model of big data adoption factors and knowledge management sharing in an organizational environment influence organizational intelligence applies the Technology-Organization-Environment Framework. The model consists of technological factors: relative advantage, complexity, compatibility, organizational factors: top management support, organizational data environment, organizational readiness, and environmental factors: government regulation and policy and external pressure, while the knowledge management sharing factor consists of age diversity, cultural diversity, and organizational culture.

4. Discussion

The theoretical model of big data adoption factors and knowledge management sharing in an organizational environment influence organizational intelligence applies the Technology-Organization-Environment Framework. The model consists of three main factors: first, the technology factor, divided into three components; second, the organizational factor, divided into three components; third, the environmental factor, divided into two components, all

of which influence and contribute to big data adoption. The knowledge management sharing is divided into three components which influence knowledge management sharing in the organization. In line with (Hashim et al., 2021) developed conceptual framework of the relationship between big data adoption factors and organizational impact that emphasizes productivity, cost savings, and innovation using a Technology-Organization-Environment Framework. The results showed that the conceptual framework was suitable for conducting survey research at the organizational level. In addition, the research of (Hiran & Henten, 2020) researched an integrated TOE–DOI framework for cloud computing adoption in the higher education sector: a case study of Sub-Saharan Africa, Ethiopia. The results revealed that all four factors: technology, organization, environment, and social culture, influenced cloud computing adoption in higher education. Accordance with (Wessels & Jokonya, 2021) studied factors affecting the adoption of big data as a Service in SMEs using the Technology-Organization-Environment Framework. The results indicated that organizational factors: organizational readiness, personnel knowledge, financial cost, and infrastructure, and environmental factors: legal, vendor competency, and competition, affected SMEs' big data adoption. While (Lutfi et al., 2022) researched the factors Influencing the adoption of big data analytics in the digital transformation era: a case study of Jordanian SMEs. The results discovered that relative advantage, complexity, security, top management support, organizational readiness, and government support influenced the adoption of big data, while competitive pressures and compatibility are not significant. A study by (Cruz-Jesus, Pinheiro, & Oliveira, 2019) on understanding CRM adoption stages: empirical analysis building on the TOE framework revealed that technology capability, data quality and integration, top manageesh support, and customer relationship management positively affected the adoption of customer relationship management. Additionally, the research (Baig, Shuib, & Yadegaridehkordi, 2021) researched a model for decision-makers' adoption of big data in the education sector by applying the Technology-Organization-Environment Framework and Diffusion of Innovations. The results stated that relative advantage, complexity, compatibility, top management support, financial resources, personnel expertise and skills, competitive pressure, security and privacy, and government policies were key factors in the adoption of big data. But the technological infrastructure did not affect the adoption of big data.

5. Conclusion

The theoretical model proposed in this paper provides an opportunity to improve and consider the key factors of big data adoption and knowledge management sharing, including the impact on the organization. It may also provide information and guidance for organizations to formulate strategies and action plans to achieve competitive advantages and ultimately drive organizational intelligence. However, to validate this theoretical model, further survey research is required.

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