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# Assessing the Big Data Adoption (BDA) Factors: A Systematic Literature Review

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**Abstract**

Organizations expect to achieve excellence and more productiveness in their business. To sustain the current business landscape, organizations continuously look for sufficient ways to utilize their valuable resources, regardless of the existing Big Data. Big Data Adoption (BDA) is described as placing an advanced method to the existing and incoming data in the organizations for operational activities. However, in the development of BDA, there is an absence of an in-depth review of certain topics, issues, and classification of the existing studies in this area. This study aims to increase the understanding of BDA at present by underlining the studies conducted in this area, theoretical models, the relevant factors, and tools and techniques used. The review methodology of this Systematic Literature Review (SLR) follows the guidelines from Meta-Analyses (PRISMA) that can be accessed through the website www.prisma-statement.org. This type of SLR involves four phases; identification, screening, eligibility, and inclusion. The set of questionnaires was set up to be answered resulting in thirty studies identified in the domain of BDA after reviewing and extracting relevant information. 1) As a result, Technology–Organization–Environment and Diffusion of Innovations are the most popular theoretical models used for BDA in various domains. 2)This study exposed thirty-five factors in technology, organization, and environment that are relevant to the BDA and, 3) The BDA research in various field. This study exposes the factors that can be considered by researchers and management in BDA for improvisation.

**Keyword:** Adoption, Big Data, Factors, Organizational impact.

## Introduction

The term Big Data refers to a crucial factor for developing competitive advantage in the context of Industrial Relations 4.0 (IR4.0). It encompasses large volumes of data generated from various sources, including social media (Twitter, Facebook), web logs, RFID, GPS, sensor networks, and medical records (Yaqoob et al., 2016; Ragusoe, 2018; Ajab, 2017). With the rise of IoT devices, organizations face the challenge of processing vast amounts of data at high speeds and in diverse formats (Curry, 2016). This influx of data can significantly impact economics, governance, healthcare, and more (Metcalf et al., 2016). As a result, researchers and practitioners are increasingly focused on enhancing Big Data capabilities across various

sectors, such as supply chain, construction, and healthcare (Tiwari et al., 2017; Malik, 2018; Ismail et al., 2018). Organizations are therefore motivated to leverage their resources to maximize value in this evolving landscape.

Theoretical models are frameworks used to explain phenomena and gain initial insights into specific situations. In Information Systems (IS) adoption studies, commonly utilized theories include the Technology-Organization-Environment (TOE) model (Tornatzky et al., 1990), Diffusion of Innovation (DOI) (Rogers, 1995), Technology Acceptance Model (TAM) (Davis, 1989), Task-Technology Fit (TTF) (Goodhue & Thompson, 1995), Theory of Planned Behavior (TPB) (Ajzen, 1985; Ajzen, 1991), and the Unified Theory of Acceptance and Use of Technology (UTAUT) (Venkatesh et al., 2003). Researchers often apply the TOE model alone for various IS adoptions, including Electronic Data Interchange (EDI) (Kuan & Chau, 2001), Enterprise Resource Planning (ERP) (Pan & Jang, 2008), and Big Data (Park et al., 2015). Some studies combine theories, such as TAM, DOI, and TOE in cloud computing (Chowdhury, 2018) and small businesses (James, 2017), or integrate multiple theories for sectors like oil and gas (TAM, UTAUT, DOI, TPB) (Sun et al., 2016). These theoretical models are essential for reporting on IS and Big Data Analytics (BDA) issues at both individual and organizational levels.

This study focuses on the following research questions:
1 What are the theoretical model used for BDA?
2 What are the relevant factors in BDA?

This paper is to explore the state of the art regarding adaptation capabilities of BDA in Malaysia's Government-linked Agencies (GLAs). By examining these strategies, the study aims to improve public administration and citizen engagement. Ultimately, leveraging BDA streamlines processes and fosters a more responsive and accountable public service, benefiting society overall.

Furthermore, this study is crucial as it offers valuable preliminary insights into BDA literature, setting the stage for future research on how technology, organization, and environment influence Big Data adoption and its impact on organizational effectiveness within Malaysia's Government-Linked Agencies. By addressing these interconnected factors, we can unlock the full potential of BDA, ultimately driving innovation and enhancing public service delivery. This research not only contributes to academic discourse but also serves as a catalyst for meaningful change in the public sector, making it an essential focus for policymakers and practitioners alike.

**Methodology**

In the process of collecting data and information, the researcher has been focused on searching thesis/dissertation on 'big data'. Prior to this searching is ProQuest Dissertation & Theses database. Then, with the same term of 'big data', the researcher explored articles on other databases such Science Direct, Emerald Insights, Springer Link, ACM Digital Library and Taylor and Francis. The result from 'big data' keyword resulting in a large number of articles. The researcher then used other keywords such as 'big data adoption', big data analytics', 'big data implementation', big data applications', 'big data strategy', 'big data TOE', 'big data adoption theories', 'big data model' and 'big data + impact'. In the process of paper selection,

the researcher followed this standard; 1) paper that are available for download and full text 2) papers relevant to the topic 3) published between 2015 and 2020 4) keyword list as mentioned and 5) manual search in Google Scholar.

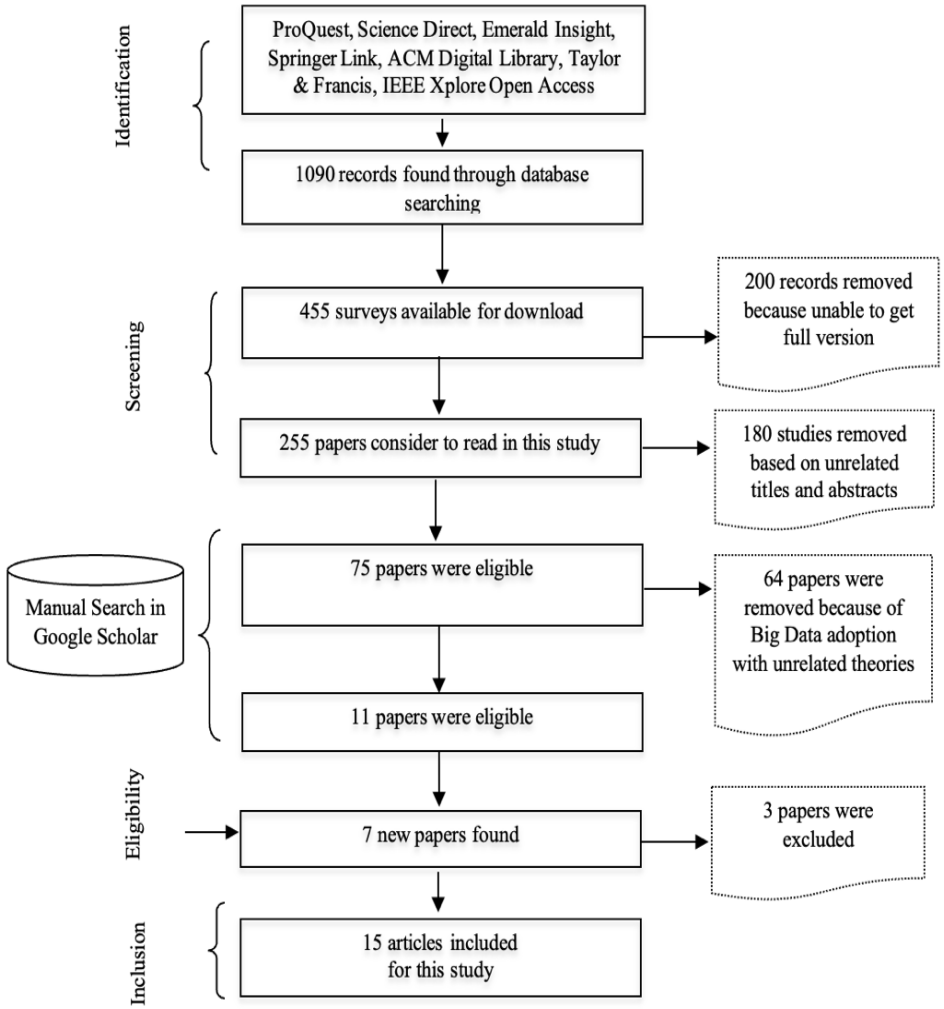


Figure 1: Article selection process

Throughout the early stage of searching, the researcher focused on theses and dissertations available in subscribed ProQuest database. As a result, there were records found in ProQuest (7), Science Direct (7), Emerald Insight (3), Springer Link (1), ACM Digital Library (1), Taylor and Francis (0) and IEEE Xplore Open Access (1). The following criteria were used for record selection (1) relevant to the topic (2) published between the years 2015 and 2020; (3) search words appear in the paper; (4) full text and available to download as shown in Table 1.

Figure 1 explained the selection process of articles and papers related to achieve the objectives. There were 1090 records found from the preliminary phase through database searching on this related topic. However, from the 1090 records listed, only 455 articles were available for download on that period. Next, the researchers used inclusion and exclusion to get closer to the topic discussed and found only 255 records included. Then, the records were examined using titles, abstract and conclusions. Among the 255 of records, another 180 were

eliminated as the papers were unrelated with the criteria mentioned. Next, from the 75 papers, another 64 were removed on the final selection as it were dissimilar with the actual topic discussed. Later, only 11 papers were related on big data and impact aspects. On final stage of selection papers, the authors decided to use manual search in Google Scholar to have more manuscripts to reviewed in this topic. There were 7 papers found in Google Scholar. Next, 3 were remove for appropriate topic discussed in this study. Finally, as in Table 1, there were ProQuest Dissertation & Theses database, Science Direct, Emerald Insights, Springer Link, ACM Digital Library, Taylor and Francis and IEEE Xplore Open Access only used to search for the related literatures in this study.

**Big Data**

Big Data refers to the vast volumes of data generated from various sources and in different formats, categorized into semi-structured and unstructured data. Semi-structured data includes machine-to-machine communication (IoT sensor streams), information-to-machine interactions (online searches), social interactions (instant messaging and social media), and crowdsourced data (cell phone usage and SMS). Unstructured data encompasses multimedia (audio and video) and documents (Shorfuzzaman, 2017). The rise of real-time applications, social networking, and IoT contributes to the growing amounts of organizational data (Curry, 2016; Jain, 2017; Zheng et al., 2015; Mourtzis et al., 2016). This surge presents challenges for organizations using traditional systems to manage it (Haddad et al., 2018). Scholars describe Big Data as rapidly increasing large datasets (Bremser, 2018), necessitating solutions to address the lack of data science expertise (Lancaster, 2019).

*Big Data Adoption*

Previous studies seen authors combining several theories with TOE to test the level of adoption, implementation, application of Big Data in the organizations, firms, companies, corporate, government sectors and higher learning institutions.

Chowdhury (2018), used TOE, TAM and DOI to study the factors in adoption of Cloud Computing using BD technology in IT organizations. The study surveyed 182 IT professional and managers in US using binary logistic regression. Six independent variables were statistically significant for predicting cloud computing adoption using Big Data technology with 92.1% accuracy. Another study conducted by James (2017) implemented TOE model incorporated with DOI and TAM, to examine the cloud-based Big Data Analytics adoption criteria for small business enterprises (SBEs). The exploratory qualitative research used semi-structured questionnaires to conduct one-to-one interviews with participants of 20 IT professionals form 10 SBEs in the state in New Jersey, United States. Bremser (2018) in his paper to study strategies and influencing factors for Big Data exploration, used TOE to investigate the initiation phase of Big Data adoption. The qualitative study interviewed head of business, IT divisions, chief architects and chief strategist from Different industry with more than 10,000 employees in Germany. Sun, Hall & Ceigelski (2016) studied the factors affecting the organizational adoption of Big Data by combining TOE, DOI and Institutional theory. The study applied content analysis based by retrieved and reviewed of relevant papers in the business intelligence & analytics (BI & A) literature published during period 2009-2015. Another researcher Agrawal (2017), investigated the determinants of organizational adoption of Big Data analytics technology by drawing upon TOE, DOI and Institutional theory. The survey was directed in randomly selected 2015 firms from the leading 261 firms in China

to collect the data. 71 useful responses were received with a response rate of 34.6% and investigated using principal components factor analysis as the extraction technique. Schull and Maslan (2018) identified the factors of Big Data Analytics in the organizational context to examine the decision-making process. The study combined TOE and dynamic capabilities theory that tailored to uniform management, talent and technology. The study addressed the top managements from 138 German companies in the collected data. The data was analysed with the help of IBMSPSS Statistics 25. Mlokozi and Zanabria (2018) in their research on key factors for adoption Big Data Analytics employed TOE and DOI. The study proposed to identify key drivers and barriers, analyse the process and determine the determinant factors of adoption Big Data analytics for achieving smart city resilience. Data were collected with open questions in the interviews with different levels and professions at the professional's levels. The three-cities involved in this study were Malmo, Gothenburg, Lund and Helsingborg in Sweden.

*Impact Studies on Big Data Adoption*

Numerous studies have highlighted the impacts of Big Data Analytics (BDA) across various disciplines, though researchers often use different terminology, such as effect, affect, and implication, to describe these impacts on organizations, firms, governments, and educational institutions. Cuquet and Fensel (2018), identified several impacts from BDA in their European roadmap research, categorizing them into societal impact, skills development, and various sectors, with a focus on data management, processing, analysis, protection, and visualization. Lukie (2017), explored how Big Data technologies contribute to competitive advantage by examining their effects on company functions and key advantages.

Brock and Khan (2017), emphasized the importance of understanding the relationship between organizational learning capabilities (OLC) and BDA. In the context of sustainable manufacturing, Dubey (2016) discussed the impacts of BDA on supply chain networks. Reichelt (2016) investigated BDA's effects on museum visitors, focusing on language metrics and donor relationships. Finally, Woodside et al. (2017) noted that BDA adoption enhances data sharing and decision-making in the government sector.

**Findings**

*What are the theoretical model used for BDA? (RQ1)*

This study revealed the theories used by several authors in various area of field in the scope of BDA around the world. The theories adapted were TOE, DOI, TAM, UTAUT, RBV, Institutional theory, Theory of planned behaviour, Dynamic capability theory and Theory of Action Reason. In variations of objectives and setting, the studies implemented the listed theories at the firm and individual level. Some of the studies applied single theory on TOE, while most of authors integrate TOE model with two or three other theories to produce superior synthesis in the research as shown in Table 1.

Table 1
*Theories and models used in BDA research*

| Theories and models | Authors | Number of Studies |
|---|---|---|
| TOE | Chowdhury (2018); James (2017); Bremser (2018); Sun, Hall & Ceigelski (2016); Agrawal (2017); Schull & Maslan (2018); Park et.al (2015); Mlokozi & Zanabria (2018); Salleh & Janczweski (2016); Ismail (2016); Sam & Chatwin (2018); Ribot (2016); Almoqren & Altayar (2016); Nguyen & Petersen (2017); Hwang et al (2016) | 15 |
| DOI | Chowdhury (2018); James (2017); Bremser (2018); Sun, Hall & Ceigelski (2016); Agrawal (2017); Mlokozi & Zanabria (2018); Ribot (2016); Nguyen & Petersen (2017); | 8 |
| TAM | Chowdhury (2018); Ribot (2016); Nguyen & Petersen (2017) | 3 |
| UTAUT | Silva et al (2019); Brunink (2019); Haddad et al (2018); Queiroz (2019) | 4 |
| RBV | Dubey et al (2019); Mikalef et al (2018); | 2 |
| IT | Dubey et al (2019); Sun et al (2020) | 2 |
| DCT | Gupta et al (2019); Shan et al (2020) | 2 |
| TBP | Varma (2018) | 1 |
| TTF | Shirazi & Keramati (2019) | 1 |

The TOE model, introduced by Tornatzky and Fleischer (1990), identifies three key contexts namely i)technological context that refers to the technology available from suppliers and vendors ii) organizational context that includes management practices, organizational size, and resources and iii) environmental context that encompasses the competitive landscape and relationships with trading partners and public sectors. The DOI theory by Rogers (1995), examines the degree of innovation adoption and includes factors related to individual characteristics, internal organizational structures, and external organizational factors. The Technology Acceptance Model (TAM), proposed by Davis (1986), focuses on individual acceptance of technology based on perceived ease of use and usefulness. The Unified Theory of Acceptance and Use of Technology (UTAUT) by Venkatesh et al (2003), builds on this, highlighting performance expectancy, effort expectancy, social influence, and facilitating conditions, moderated by factors such as gender and experience. Resource-Based View (RBV) theory by Barney (1991), emphasizes resources, capabilities, and competitive advantage, defining resources as critical inputs for Big Data and capabilities as how organizations utilize these resources effectively. Institutional Theory explains how external factors, like competitors and market conditions, influence Big Data adoption decisions. Dynamic Capabilities Theory (DCT) addresses a firm's ability to adapt to changes, with dimensions including environmental sensing and knowledge integration (El Sawy & Pavlou, 2008). The Theory of Planned Behavior (TPB) by Ajzen (1985) links beliefs to behavior through attitudes and perceived control, while Task-Technology Fit (TTF) by Goodhue & Thompson (1995), assesses how well technology aligns with user tasks.

*What are the Relevant Factors in BDA? (RQ2)*

The study identified 35 relevant factors from selected literatures of BDA studies. Table 2 stated technology relevant factors (11), Table 3 shown organization related factors (11) and Table 4 detailed the environment factors (12) throughout the process.

Table 2
*Technology and relevant factors in BDA*

| Category | Factor | |
|---|---|---|
| Technology | 1) Relative advantage | Agrawal (2017); Mlokozi & Zanabria (2018) |
| | 2) Complexity | Bremser (2018); Salleh & Janczweski (2016); Park et.al (2015) |
| | 3) Compatibility | Agrawal (2017); Havakhor (2016); Park et.al (2015); Bremser (2018); Sun et.al |
| | 4) Security and privacy | (2018); Park et. al (2015) |
| | 5) Perceived Benefits | Hassan et al (2017) |
| | 6) Simplicity | Sam & Chatwin (2018) |
| | 7) Data Security | Sam & Chatwin (2018) |
| | 8) Usage experience internal and | Schull & Maslan (2018) |
| | external data | Schull & Maslan (2018) |
| | 9) Experience BD related | Sun et.al (2018) |
| | technology | Sun et.al (2018) |
| | 10) Observability | Sun et.al (2018) |
| | 11) Trialability | Sun et.al (2018) |

*Technology Related Factors*

Generally, technology factors describe any technologies to the firm includes existing or outsource. Thus, it includes existing and outside technologies that practice in the current operation to adopt Big Data (Oliveira and Martins 2012; Starbuck, 1976; Sam and Chatwin, 2018).

1. Relative advantage: The capability of Big Data being explored to get great value and experience unique discovery, improved at another level than previous system. Sam & Chatwin (2018) refers relative advantage as the ability of BDA in processing and managing data with high technology offers greatest productivity for the China's firm.
2. Complexity: Big Data technology is something that very solid and tough to be used, understand and learn in the organization. In Big Data security aspect, it refers to the difficulty in providing security tools (Salleh & Janczwenski, 2016).
3. Compatibility: the ability of organization to exploit Big Data with existing technology in the organizations without having any new addition of ICT hardware in the business activities. Malak (2016) refers compatibility as existing infrastructure, working culture and experiences in the organization is appropriate to adopt Big Data environment.
4. Security and privacy: It refer to the safety aspect on company's data, compliance and System Operating Procedure (SOP) in the usage of Big Data in organization. In the condition with data increasing in every single minutes, security and privacy in healthcare refers to the concern of personal patient's data (Mgudlwa et al, 2017).

5. Perceived benefits: The condition whenever the organization gets opportunities, good return, better prospects in the current business landscape benefited from Big Data implementation. An investigation on Big Data services in manufacturing firms in India, perceived benefits gives huge advantage in '*economic profitability, savings in time and effort and cost reduction'* (Verma. 2017).
6. Simplicity: Simplicity describes the ease of use on BDA that compatible with existing system in the organization. The degree of Big Data technology acceptable with internal system for operational activities (Park et al, 2015).
7. Data Security: Big data management is crucial as it becomes a challenge to the organization to ensure Big Data processing, storage, analysing appropriate with the current technology. Thus, data security in Big Data management highlights the various sources of data require to be protected (Oussous et al, 2018).
8. Usage experience with data from internal and external sources: Autonomous data generated from internal data sensors, IoT, devices, human, business processes that offers valuable insights with analytics approach (Gupta & George, 2016).
9. Experience Big Data related technology: Big Data technology as whether the organization has adopted any Big Data initiative in any section, unit or department in their business operations. Schull & Maslan (2018)
10. Observability: Firms' lesson learnt from others where Big Data being beneficial. The potential of good return from Big Data activities by inspiration from other adopters (Sun et al, 2018).
11. Trialability: Simple and uncomplicated of Big Data features that is enabled to be implemented in the organization (Sun et al, 2018).

Table 3
*Organization and relevant factors BDA*

| Category | Factor | Authors |
|---|---|---|
| Organization | 1) Management Support | Halaweh & Massry (2015); Malak (2016); Park et.al (2015) |
| | 2) Competency | Park et.al (2015); Bremser (2018) |
| | 3) Financial/cost/budget | Tomar et.al (2016); Gandomi et.al (2015) |
| | 4) IT Resources | Hassan et al (2016) |
| | 5) Organizational Learning Culture | Salleh et al (2016); Ismail et al (2016) |
| | 6) Financial readiness | |
| | 7) Technological readiness | Ismail et al (2016) |
| | 8) Skills | Ismail et al (2016); Sun et.al (201 |
| | 9) Human resources | |
| | 10) Business resources | Sam & Chatwin (2018), Sun et.al (2018) |
| | 11) Firm size | |
| | 12) Appropriateness | |

*Organization Related Factors*
Organizational related factors refer to characteristics of organization itself that may influence or refuse to integrate Big Data. In addition, it describes organization's conditions that support or constrain to the Big Data adoption (Lipert, 2006; Salleh and Janczweski, 2016).

1. Management support: Encouragement in BDA from upper level management by providing necessary mechanism to the business operation. Sufficient resources allocated, fast approval for new resources, data-driven culture in the process of Big Data implementation in the organization (Bremser, 2018; Sun et al, 2018).
2. Competency: Ability to perform tasks or process as expectation with BDA in organization. As organization made decision to invest in Big Data infrastructure, organization were very optimist that the potential of Big Data may return high value focusing in managing information and data analyst as well as developing into data-oriented culture (Collymore et al, 2017).
3. Financial/cos/budget: Cost refers to the amount of money to spend in implementation of Big Data such processing hardware (Baig et al, 2019).
4. IT resources/computing resources: It refers to the Big data initiative in the organization with powerful computing resources would be impossible to gather data, process and examine to create successful applications (Ashraf, 207).
5. Organizational learning culture: The degree which implementation of Big Data in the organization is creating new knowledge in terms of technology, learning and practicing in the data driven culture.
6. Financial readiness: It mentions that financial readiness is a situation when organization is prepared for the new facilities and equipment in the Big Data implementation. According to Bremser et al (2017) financial readiness carried out the Big Data tasks when organization affords to provide their own lab for use cases and partnering with their trading partners,
7. Technological readiness: It refers to situation when organization's IT infrastructure is ready to adopt Big Data project. Technological readiness refers to the capability of IT infrastructure in the organization to integrate innovation such Big Data analytics (Agrawal, 2017).
8. Skills: It refers to qualified human experts that are well trained to handle Big Data from the foundation until the complex process. According to Wamba et al (2015) Big Data analytic skills refers to data analysts with capability in management, infrastructure and talent (technical and business relation).
9. Human resources: It describes the group of people that being empowered to complete their own speciality tasks in the organization. One of the most frequent aspect to be encountered in implementing Big Data are trained staff and data scientist as its involved interdisciplinary field with structured and unstructured data (Upadhyaya, 2017).
10. Business strategy orientation: It refers to the organization that focused on the business prior to Big Data analytics for strategic decision (Sun et al, 2018)
11. Firm size: According to Sun et al (2018), firm size describes well established firms may support the BDA as it could support in various aspects (Sun et al, 2018)
12. Appropriateness: It refers to the degree of overall changes to adopt Big Data in giving advantage to the organization. Sun et al (2018) agree appropriateness means the organization benefited from BDA at the present.

Table 4
*Environment and relevant factors in BDA*

| Category | Factor | Authors |
|---|---|---|
| Environment | 1) Competitor pressure | Havakhor (2016); Park et.al (2015); Sun et.al (2018); |
| | 2) Partner pressure | Sun et.al (2018); Bremser (2018); Park et.al (2015); Ismail et al, 2016; Sam & Chatwin, 2018 |
| | 3) Government policy | Salleh & Janczweski (2016); Sun et.al (2018); Park et.al (2015); Bremser (2018); Ismail et al, (2016) |
| | 4) External Pressure | Hassan et. al (2017) |
| | 5) Risk in outsourcing | Salleh et al. (2016) |
| | 6) Vendor Support | Ismail et al. (2016) |
| | 7) Market pressure | Schull & Maslan (2018) |
| | 8) Trading partner readiness | Sun et.al (2018) |
| | 9) Uncertainty/risk concern | Sun et.al (2018) |
| | 10) Market turbulence | Sun et.al (2018) |
| | 11) IS fashion | Sun et.al (2018) |
| | 12) Regulatory measures | Bremser et al (2017) |

*Environment Related Factors*

Environment related factors refers to the circle of entities for firms conducting its business includes industry, competitors and dealings with government. It is comprising of site, setting and domain where firms operate their commercial activities such as deals with government (Lipert, 2006; Salleh and Janczweski, 2016; Oliveira and Martins 2012).

1. Competitor pressure: It describes as the situation of surrounding entities of the organization such as suppliers, vendors, partners and competitors already getting benefits and being resourceful with Big Data activities.
2. Partner pressure: It refers to partner's in the business landscape circle readily present with Big Data technology in operating their business.
3. Government support: related to any acts, policies, guidelines and initiatives developed by government and its associates to encourage Big Data eco system for business organization in the country.
4. External pressure: The condition whereby firms met pressures from the entities they deal with in the business landscape. Moreover, due to the constant of technology changes, it is crucial for the firms need to remain competitive (Hassan et. al (2017).
5. Risk in outsourcing: Due to limited infrastructure to adopt Big Data, companies would take a risk to outsource their Big Data processes to the expert. Few issues encountered in companies' decision in outsourcing such privacy, security, transaction, compliance and contractual risks (Baig, 2019).
6. Vendor support: The condition vendors offer various necessary exercise to new update technology to ensure the firms provided with data driven oriented (Gartner, 2017).

7. Market pressure: It refers to pressure that enforce firms to do some changes to their products, services and customers experiences (Carnelley et al, 2016). This situation happened when the competitors are readily produced with the latest technology, products and services from Big Data orientation.
8. Trading partner readiness: The condition whereby firms adopted Big Data to have the same situation with their trading partner for the collaboration (Sun et al, 2018)
9. Uncertainty/risk concern: It refers to the unpredictable risk in various aspect related to BDA such data security, profit (Sun et al, 2018).
10. Market turbulence: The condition when fluctuations on customer's preferences in Big Data environment (contemporary on preferences, demand and needs on product and services).
11. IS fashion: The process which firms established the trend of current system from managerial interactions, social channels and trends (Sun et al, 2018)
12. Regulatory pressure: The condition when firms have to face the changes in regulatory that is involved in financial, increasing cost, data distributed and formulated strategy (Bremser, 2017).

**Research on Bda**

Big data contribution to the organizations, companies, public, government and country has given positive return in many ways. Several researchers emphasized the different roles of Big Data in various areas.

Table 5
*The role of Big Data*

| Authors | Big Data Roles |
|---|---|
| Nancy, 2018; Maglio and Lim, 2016; | Smart City |
| Quinn, 2016; Ajab, 2018 | Healthcare and Pharmaceutical |
| Edwards et.al, 2016; Bamiah et.al, 2018; Molina, 2019 | Education and Learning |
| Ismail et al, 2018; Zhao and Yang, 2017; Fernando et al, 2018; | Supply Chain and Manufacturing |
| Himmi et.al, 2017 | Airline Industry |
| Ismail et al, 2018 | Construction Industry |
| Oussous et al, 2018; Polkowski, 2016 | Tourism Industry |
| Su, 2017; Goodgridge and Haskel, 2015; Sen et al, 2016 | Insurance |
| Tiwari et al, 2017; Cuquet et al, 2017 | Oil and Gas |

Big Data Analytics (BDA) has become a diverse topic across various fields. Studies by Nancy (2018), Maglio, and Lim (2016), highlight its role in Smart Cities, where it aids in traffic statistics, utility management, weather monitoring, and visitor data analysis. In Healthcare, Quinn (2016), and Ajab (2018), emphasize its use in drug discovery, clinical trials, and optimizing patient care by mining relevant data. In Education, BDA helps analyze leadership patterns, student performance, and e-learning activities (Edwards et al., 2016; Bamiah et al., 2018; Molina, 2019). In manufacturing and supply chains, it enhances operational efficiency by combining external data with existing datasets for better decision-making and demand forecasting (Ismail et al., 2018; Zhao and Yang, 2017; Fernando et al., 2018). The airline

industry uses BDA to streamline decision-making and personalize customer service (Himmi et al., 2017). In construction, it supports data management through ERP systems and Building Information Modeling (BIM) (Ismail et al., 2018). The tourism sector leverages BDA for demand prediction and marketing strategies (Oussous et al., 2018; Polkowski, 2016). Additionally, in insurance, it helps classify claims and assess customer risks. In the Oil and Gas sector, BDA aids in gas exploration and environmental impact reduction (Tiwari et al., 2017; Cuquet et al., 2017).

**Conclusion**

The finding on factors that are relevant to the BDA in organization has been listed. There are eleven (11) technology related factors identified, organization related factors listed in twelve (12) and twelve (12) environment related factors have been discussed. Thus, this study is preliminary literature review to study on assessing Big Data relationship in the context of Malaysia-linked agencies.

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