CHAPTER 3

On How Big Data Revolutionizes Knowledge Management

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Introduction

The present century being a knowledge economy, there is significant reliance on information and the availability of intellectual capital (IC). In this scenario, knowledge management (KM) has emerged to become an integral part of every organization. Increasingly, organizations are relying on the knowledge possessed by their employees for decision-making processes. Erstwhile KM practices and platforms were driven toward capturing and codifying the available explicit knowledge into digital artifacts, which made the collective organizational knowledge available to a much wider set of practitioners. These KM practices and tools were extremely successful across diverse industries, particularly in knowledge-driven sectors such as Consulting, Information Technology (IT), life sciences, and others. However, they were limited in that they were primarily focused on codifying the explicit knowledge artifacts and providing services for searching and retrieving these artifacts from the database.

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In the present scenario, one of the major challenges facing organizations is the reconstruction of knowledge from one form to another. To successfully navigate this challenge, organizations are required to take consistent and strident steps to attain their identified goals through the efficient use of tacit knowledge. This leads to the creation of a contextual relationship between big data analytics and the management of the explicit knowledge (Davenport & Patil, 2012; Khan & Vorley, 2017). It is in this context, Khan and Vorley (2017) have identified the seminal role that big data analytics plays in capturing, acquiring, and sharing large volumes of explicit knowledge and how they may be interpreted through tacit insight. It has thus been proposed that big data and KM have a similar objective of disseminating knowledge and producing conclusive outcomes for organizations.

Technology-Driven Business Transformation

Technology has helped transform business processes and models over the years. Enterprise resource planning (ERP) and customer relationship management (CRM) helped to digitize organizational data and streamline flow of information, the new technologies like cloud computing, innovative, and cost-effective communication systems have made it possible even for small and medium enterprises (SMEs) to join the technology highway. As a result, the entire value chain has been digitized.

All the links in the chain—suppliers, distributors, retailers—were now in position to stay connected by means of these technologies. This led to a streamlined delivery process and higher efficiency of the entire system. As more and more organizations joined this technology highway, the cost of tech products decreased, starting a virtuous cycle of high demand and low price. The result was adoption of these technologies in the mainstream across the entire ecosystem.

Another simultaneous change was in progress—customer technology was being commoditized very rapidly. Widespread use of smartphones, e-commerce platforms, and availability of mobile internet were some of the major contributors in bringing technology closer to the end consumer. This new generation of consumer was not only shopping online, they were also pretty open about voicing their choices and opinions and sharing feedback on social media platforms. This information came directly from the horse mouth hence was not only true and reliable but also instantaneous. The intersection of digital technology across all ends

of the spectrum is generating colossal data every minute, and this data, if processed and analyzed, can provide extremely useful information for all stakeholders.

Advantages:

1. Transformation of business models
2. Generate new sources of revenue
3. Resource optimization
4. Maximize shareholder wealth

Challenges:

1. A centralized approach for identifying and analyzing big data may not be present—though there are talks about it, not many organizations have the process and technology to identify, capture, and analyze the data coming in from various sources.
2. Talent is another limiting factor. Capable data scientists with knowledge about the industry/firm ecosystem may not be available.
3. Change needed in strategic intent—using knowledge assets to build practices around insights drawn from data is required.

The knowledge pyramid of conversion of data–information–knowledge–wisdom holds immense opportunity for organizations, countries, and the world at large. The emergence of new technologies, proliferation of the internet and smartphones, and dominance of the industry by tech giants like Apple, Amazon, Facebook, etc. has produced humungous amount of data. This has made it imperative for the field of knowledge management to develop new ways and means of analyzing and utilizing this information for global transformation.

This revolution is not just restricted to technology—it has made rapid advances to areas like manufacturing, warehousing, and logistics. Professionals of the area believe that the emergence of Industry 4.0 will be ruled by the following four:

- data volume
- computational power and connectivity
- business intelligence and analysis capabilities
- human machine interaction advances like touch screen, voice recognition, and augmented reality

Knowledge Management

The study of KM is close to touching a 25-year mark. With initial talks about knowledge in organizations in early 1990s, "knowledge creation company" by Nonaka and Takeuchi (1995)) provided a solid ground for KM to be established as a discipline in the industry. The concept garnered a lot of attention, and numerous research papers have been published in the area since.

The literature on KM speaks about these two views of a firm—resource-based view (RBV) (Barney, 1991; Penrose, 1959; Wernerfelt, 1984) and knowledge-based view (KBV) (Grant, 1996; Kogut & Zander, 1992; Spender, 1996; Teece, 1998). While the RBV focuses on the tangible and intangible resources an organization possess, the KBV takes stock of knowledge that exists within an organization and propounds that this knowledge is the source of unique and sustainable advantage the firm enjoys in the market. Both these views are based on the premise that an organization's performance is dependent more on its internal factors and less on its product positioning in the market place.

KM and intellectual capital (IC) together identify and manage knowledge assets to provide a competitive edge to a firm. IC clearly demarcates between human capital, structural capital, and relational capital (Bontis, 1999). Human capital refers to job-related skill set, structural capital refers to knowledge that exists within the organization, and relational capital exists by virtue of relations with customers, suppliers, etc.

The study of KM focuses on:

1. Tacit/explicit knowledge—based on easier or harder to capture/share (Nonaka & Takeuchi, 1995)
2. Complexity and stickiness (Kogut & Zander, 1992; McEvily & Chakravarthy, 2002)
3. Tools and techniques employed for KM like communities of practice (COPs)
4. Organizational factors like culture, trust, infrastructure, and so on, which influence the existence and smooth flow of KM processes in the organization.

Choice of the correct KM approach is a complex process and varies with a firm's circumstances.

KM refers to the process of identification of collective knowledge that exists in an organization and leveraging it to help the organization compete in the market place (Von Krogh, 1998).

From the above, it is clear that KM and strategy must work hand in hand to achieve the desired results. Linkage between the two has been suggested earlier (Hansen, Nohria, & Tierney, 1999; Hunter, Beaumont, & Lee, 2002; McDermott & O'dell, 2001; Pan & Scarbrough, 1999). KM in an organization should link to and flow from the organization's overall strategy. Researchers have emphasized on enablers, processes, and organizational performance as part of KM strategy (Lee & Choi, 2003).

KM processes typically refer to basic operations of knowledge—creation, sharing, storage, dissemination, and usage; KM enablers provide the right environment, support, and infrastructure for these processes to exist in the organization.

It is generally recognized that KM is cross-functional and touches various aspects of an organization. Many researchers have worked on this integration between different links of KM enablers, KM processes, and organizational performance (Andreeva & Kianto, 2012; Darroch, 2005; Gloet & Terziovski, 2004; Gold, Malhotra, & Segars, 2001; Hislop, 2003; Kianto, 2011; Lee & Choi, 2003; Palacios Marqués & José Garrigós Simón, 2006; Singh, Shankar, Narain, & Kumar, 2006; Zack, 2009).

Big Data and the 3V Model

In 2001, Doug Laney, an analyst at Garter (formerly META), put forth a preliminary definition of big data using a 3V model, namely, volume, velocity, and variety. Almost a decade later, in 2011, the International Data Corporation (IDC) proposed another definition for big data, stating that "big data technologies describe a new generation of technologies and architectures, designed to economically extract value from very large volume of a wide variety of data, by enabling the high-velocity capture, discovery, and/or analysis" (Sumbal, Tsui, & See-to, 2017). In recent years, much speculation and interest has surrounded big data, largely due to the availability of colossal amounts of data. This has been made possible due to the widespread dispensation of information through electronic devices and rising innovation in the field of IT.

Big data has been identified as having the potential to revolutionize the large amount of data available in present times (Davenport & Patil, 2012).

This large volume of available data has opened business organizations to the realization that there is a critical need to manage this data efficiently by storing and using it for improving accuracy in decision-making (George et al., 2014). While traditionally businesses have been dependent on the transactional data stored in relational databases for making key decisions, critical data can, however, serve as a potential reservoir for non-traditional, less-structured data forms in the present times such as emails, weblogs, social media, photographs, sensors, etc. that can unearth useful information. What makes this data even more accessible is the declining cost of storage as well as computer power. Consequently, companies everywhere are leaning toward incorporating unconventional yet potentially very valuable data, or big data, alongside the traditional enterprise data that was hitherto being used in their business intelligence analyses (Rajpathak & Narsingpurkar, 2013).

McAfee, Brynjolfsson, Davenport, Patil, and Barton (2012) observe that big data creates a potential for basing decisions on factual information as opposed to instincts, which can serve companies advantageously by providing them with a competitive edge. The vast amount of data available in present times cannot be processed adequately by the existing and predominantly traditional technologies, and it is here that big data steps in as a superior tool to extricate knowledge from this data (Kabir & Carayannis, 2013). This has led to a realization within businesses and organizations that big data holds tremendous scope in enhancing the competitive edge by serving as a treasure trove of novel ideas, valuable insights, and new knowledge.

However, it needs to be underscored that the true potential of big data can be achieved only when it is used in decision-making processes. But it is significant to note that the conventional approach of data analysis practices cannot be applied to big data. It is here that the 3V approach to big data—Variety, Velocity, and Volume—becomes significant (Kabir & Carayannis, 2013). Each of these aspects is explained as follows:

- *Variety*: The proliferation of IT has caused a significant increase in the sheer number of sources for data in present times, which in turn has led to an immense variety in the data available. Further, these resources are classed into three distinct categories, viz., structured, semi-structured, and unstructured. Structured data is that which is stored in a secure file and can be readily accessed. Data collated from vague sources and is difficult to analyze is unstructured data. Semi-structured

data is that which is not organized in any special format but nevertheless contains some tags or identifiers which make it easier to process as compared to raw unprocessed data.

- *Volume*: The volume of data available is a challenge for organizations as the amount may run into terabytes and petabytes, making it difficult for the prevailing techniques of data analysis to process them.
- *Velocity*: Another challenge nowadays is the speed at which the data is generated and analyzed. Faster speeds of analysis are of utmost importance to organizations, as it will enable them to implement this processed data for better decision-making for the benefit of the organization.

The Contextual Relationship Between Big Data and Knowledge Management

Knowledge has been acknowledged as a fundamental aspect of any theorization on big data (Pauleen & Wang, 2017). Big data and analytics will fail to achieve the desired results in the absence of knowledge, as it is the latter that has led to the expansion and identification of the true potential of big data. Collection and analysis of data through the use of the appropriate techniques is dependent on the experience of the humans. It is human knowledge which will determine how the information extracted from big data is used and whether it will be applied in operational, tactical, or strategic domains. Consequently, the impact of knowledge on the role that big data will play in different sectors cannot be underestimated. This is further elucidated through an analysis of the major objectives of KM and the role that big data plays in their realization.

One of the key goals of KM is effective decision-making, which is currently accomplished by using the knowledge generated from big data analytics. This also serves to evidence the relationship between KM and big data (Crane & Self, 2014; Sumbal et al., 2017). As big data has been viewed as a potential source for generating new knowledge, it is a challenge for organizations to identify and positively exploit the true potential of digital transformation. For this, it is important to undertake a cohesive strategy to set up effective communication systems and processes to facilitate the exchange of information and data analytics, which will create a holistic approach toward KM in the digital context and foster a culture of data-driven decision-making within organizations.

Another goal of the KM system is the effective codification and sharing of the key knowledge assets. Unlike in the case of the traditional KM system, big data and the information herewith can be a source of new knowledge. That both KM and big data are concerned with some intangible asset in the form of data, information, knowledge or intelligence has also led to the development of what has been perceived as a "natural connection" between the two (Erickson & Rothberg, 2014). To ensure that these resources are efficiently utilized and meet the advanced requirements of the organizations, it has been recommended that advanced KM systems replace the erstwhile systems of rudimentary text mining tools, document analysis mechanisms, and knowledge-sharing systems (Intezari & Gressel, 2017). To generate higher value for the existing KM systems of organizations, these advanced KM systems will need to assimilate big data into their knowledge databases.

Big data analytics also becomes of crucial importance in the big picture, playing a vital role in capturing and sharing explicit knowledge by furthering its dissemination via tacit cognizance using big data analytics. In decision-making within organizations, this leads to gaining new insights into knowledge for effective and fastidious actions (Khan & Vorley, 2017).

The model presented below underlines projecting light on the contextual relationship between big data and knowledge management. At the base of the KM pyramid lies data that is composed of discrete facts and when viewed from the perspective of explicit knowledge, it refers to the movement of actions and processes in any organizational system, without any context. However, when the data is viewed in terms of a frame of reference or context, it acquires the form of information, often as metadata. When this information is further transformed through intuition, reflective thinking, personal experience, and learning of the user, it is converted into knowledge. In contrast, big data refers to the structured, unstructured, or semi-structured data collated from different sources. The application of analytics to large amounts of operational and transactional data, or explicit data, by relating it to its context gives rise to meaningful and valuable information, which directs the user toward the complete picture by studying and organizing the underlying trends and patterns revealed from the information (Fig. 3.1).

Clearly, information is a core aspect of knowledge. When meaningful information is supplied to business intelligence tools, it leads to the creation of actionable knowledge, or in other words, KM.

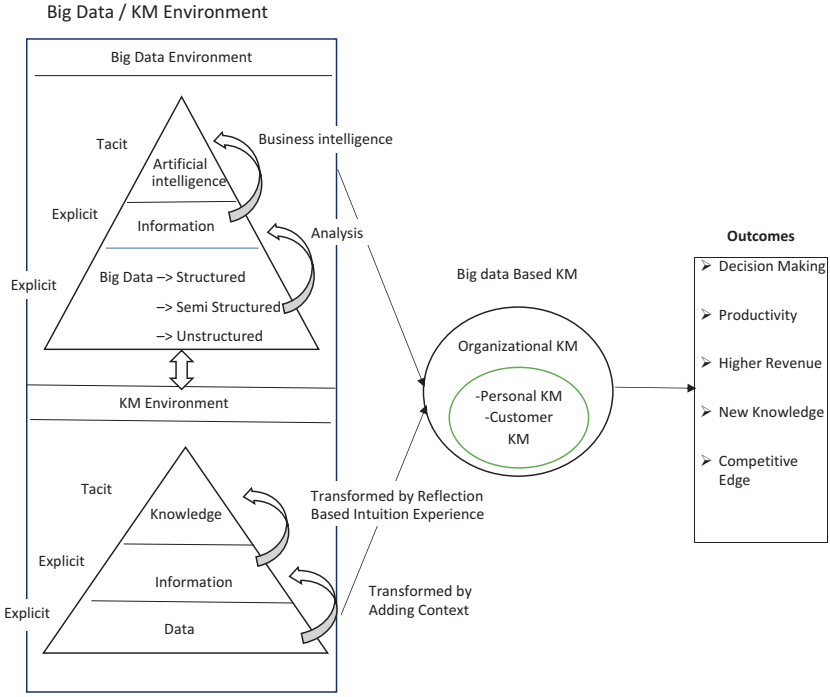

Fig. 3.1 Intersection of big data and KM in business

According to the Socialization, Externalization, Combination, and Internalization (SECI) model proposed by Nonaka, knowledge can be distinguished into two types: explicit knowledge and tacit knowledge. The former, also known as digital knowledge, is the formal and codified form of knowledge, which is captured in databases and archives and is similar to big data. On the other hand, tacit knowledge is that which exists in the minds of people and is hence much more difficult to codify. For any organization, it is the tacit knowledge of experienced employees which is significant for decision-making using big data. By bringing together the tacit knowledge of employees with the explicit knowledge that is obtained from big data, the creation of actionable knowledge and innovation is stimulated (Sumbal et al., 2017).

Clearly, big data in the form of digital data generates explicit knowledge. However, this occurs only when the available data is managed,

analyzed, and embedded in the proper context. This is done by individuals, thus making tacit knowledge a pivotal aspect of big data management (Kudyba, 2014). To this has been added the generation of predictive knowledge from big data as an ancillary goal for KM decision-making (Sumbal et al., 2017).

Big data analytics has tremendous potential for organizations, and this can be realized only by leveraging it to boost decision-making (Gandomi & Haider, 2015; Sasson, Ravid, & Pliskin, 2017) Additionally, both KM and big data were conceptualized as agents that would provide deeper insights and promote better decision-making, improve productivity, generate higher revenue, and provide a competitive edge to organizations (Elgendy & Elragal, 2014; Ohlhorst, 2012; Pauleen, 2017). The conception of novel information and knowledge or explicit knowledge from big data and its implementation in decision-making alongside the use of tacit knowledge can be extremely beneficial for enhancing the accuracy of decision-making in organizations. By focusing on such aspects as the storage and dissemination of knowledge, a more informed insight may be obtained into when and how big data can serve organizations better. At the same time, a study of variables such as the nature of knowledge (tacit or explicit), can be useful for predicting the types of knowledge apt for use in different situations and industries. This will also enable the users to gain a better understanding of when and where further inputs of big data may be advantageous (Erickson & Rothberg, 2014). Analytics can also serve useful for effective KM, leading to further improvement in the functioning of organizations, thus promoting a stronger case for the intersection of big data and KM (Sumbal et al., 2017).

Role of KM in Big Data

Role of Big Data in Personal Knowledge Management (PKM)

The manner in which individuals build knowledge by utilizing such knowledge management tools which involve the collection, absorption, and the use of knowledge and the process of innovatively using knowledge has been referred to as personal knowledge management (PKM). In PKM, the focus is on the individual and his/her quest to imbibe more information, enhance work efficiency, and socialize. One of the key attributes of PKM

is that it provides individuals with an opportunity to improve how they manage knowledge processes and interaction and collaborate to exchange knowledge and information with others (Huang, Pauleen, Scahill, & Taskin, 2018). Razmerita, Kirchner, and Sudzina (2009) have determined that the goal of PKM is to facilitate the work of individual knowledge workers instead of aiding the formation of organizations. Through this, PKM encourages the creation of personal knowledge for individuals by helping them discover and value information as a significant variable.

In recent times, with the application IT tools across sectors, several studies have sought to evaluate PKM in the context of the internet and Web 2.0, especially in terms of their use and management of personal knowledge (Rao & Chen, 2013; Razmerita et al., 2009) still PKM is an under-researched area (Pauleen, 2009). One of the core components of PKM is technology that enhances the efficiency and effectiveness of individual workers. This technology is useful for classifying ideas and information, and for archiving communication such as emails and other items so that they are easily accessible. In PKM, technology tools are considered to be imperative for enhancing the efficiency and confidence of the users as well as for the development of more effective information and knowledge management skills and dissemination and receipt of up-to-date information (Agnihotri & Troutt, 2009; Benitez & Pauleen, 2009). Liu, Wang, and Lin (2017) in their study on the applications of big data in PKM concluded that five domains:

1. *Time management*: Increased information sharing through facilitation of provision of resources which were earlier not available like software for converting the earlier not-so-easy convertible files to now free availability of such resources
2. *Computer usage efficiency management*: Retrieval of contextual information while using computers and internet gets facilitated as an individual's behavior is understood and reciprocated to through the use of Big Data.
3. *Mobile devices using behavioral management*: Behavioral parts of individuals can be analyzed using mobile phones without time and space constraints, this data is of massive use to organizations and individuals.
4. *Healthcare management*: Individuals users of mobile technology have access to unlimited apps and software, which may be of help in managing personal health by providing timely updates and reminders

about food, medicine, walk, etc. Technology has gone to the extent of being able to provide even ECG of the wearer, which may go a long way in avoiding cardiac problems by early diagnosis (Murdoch & Detsky, 2013).

5. *Browsing surfing management*: Interface between big data and an individual's surfing behavior can help in finding relevant information faster than usual. Tech devices can be made to remember the more frequently used, searched, visited websites/places hence improving the surfing experience.

The Role of Big Data in Customer Knowledge Management(CKM)

One of the key assets for any organization is customer knowledge, and hence, customer knowledge management or CKM is an important aspect for business. CKM facilitates the exchange of customer knowledge both within firms and between customers and firms in order to facilitate learning from, about, and with customers (Gibbert, Leibold, & Probst, 2002; Martín-de Castro, 2015). When customers are involved in the firm's practices through CKM, the external environment of the firm is linked to its internal environment. This, in turn, enables the transfer and sharing of information within the firm and with customers. However, there have been identified several challenges in converting customers' tacit knowledge (experience, ideas, information, difficulties, requirements, data, etc.) to explicit knowledge (useful ideas for resolving the problems of customers, for innovative services, or for upgrading current services (Taherparvar, Esmaeilpour, & Dostar, 2014).

Major retail companies such as Amazon.com, eBay, Walmart, and others have been able to successfully manage large amounts of knowledge and communicate with customers through the inclusion of real-time KM for the generation of knowledge using big data and analysis techniques (Davenport & Patil, 2012; McAfee et al., 2012; Waller & Fawcett, 2013; Sumbal et al., 2017). In these companies, the data accumulated from different sources is converted into business intelligence and knowledge via analytics. Big data analytics is also crucial in the assessment of the behavioral patterns of consumers, which is accomplished using such technology as machine-to-machine platforms and social media. The main objective here is to encapsulate the structured and unstructured data

through big data in a manner that will transform it into actionable insights by using CKM and lead to the generation, sharing, and storage of knowledge (Chan, 2014). This integration of big data and CKM for the generation of actionable insights for businesses support the creation of value for organizations.

Integration of Knowledge Management and Big Data

While both these systems are being implemented in activities like consumer survey, performance appraisal, capacity enlargement, etc., it can be observed that the independent framework of these two technologies share association with each other at multiple levels with KM playing the foundational role because of its earlier inception and time-tested performance in assisting with the installation of big data systems. However, big data is slowly adding benefits to KM in exponential ways that will make it a productive necessity for the future prospects of KM. Figure 3.2 presents the integration of the two. This integration is based on the premise that knowledge is central to all meaningful human activity. While analyzing big data, use of knowledge management is imperative as the problem or opportunity analysis must be clearly stated and form the base of the entire exercise. In the former case, big data analytics may be utilized to plan for agricultural management through geographical information or planning a city through the use of traffic patterns and trends. Opportunity identification may be purpose at hand, Google cloud platforms and Amazon web services help in the same. Organizations IT infrastructure, collaborative technologies act as the backbone for such analysis. Knowledge possessed by the employees of an organization (Tacit) and easily available coded/explicit knowledge helps us enter into the realm of big data possessed with the right weapons. Big data sources such as media, social networking sites, sensor data, archives, and log data provide humongous amount of raw data, which can be processed to find meaningful trends and opportunities by identifying and classifying the useful from the rest.

The process yields extremely useful actionable insights for managers who are in a better position to make informed decisions now. This in turn results in various benefits for the organization in terms of economic value, supply chain efficiency, and innovation.

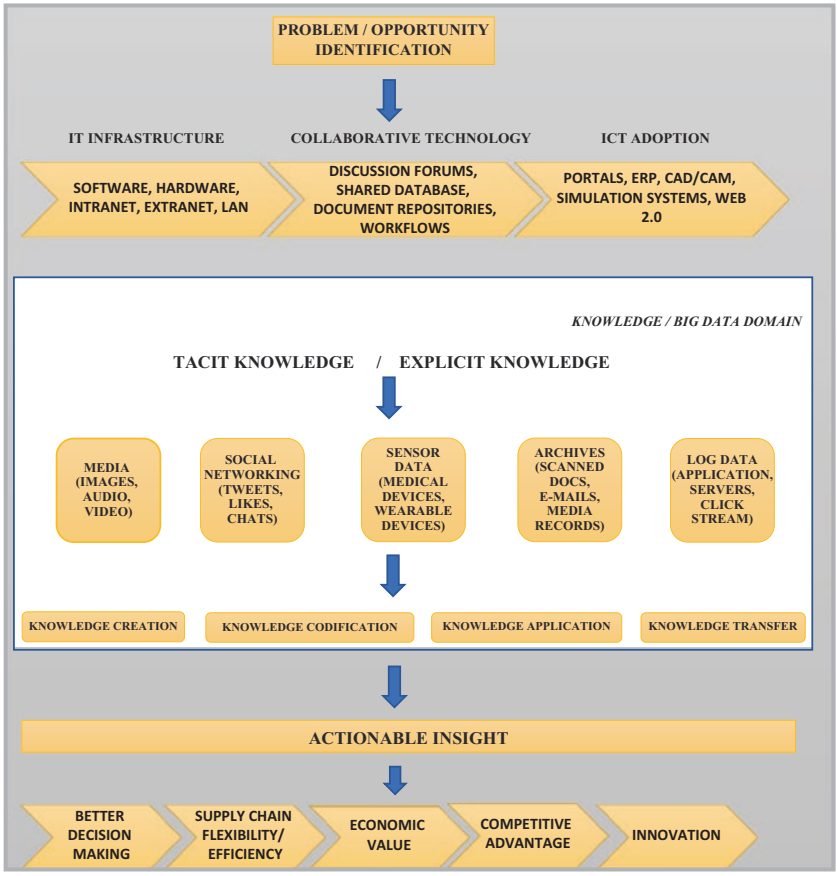

Fig. 3.2 Knowledge management—harnessing the power of big data

Therefore, the interaction of two different yet associated practices paved way to the illustrated model that can provide new business value and faster return on economic investments, enhance business operations through better decision-making, incorporate trust, promote personal and organizational-level learning, and ultimately the perks of a hybrid system that is adaptable to future needs is what comes as a bonus.

Conclusion

The twenty-first century has witnessed a major transition toward a knowledge economy of unlimited scope. During the past few years, the world has rapidly grown to connect products and services that were earlier perceived as impossible and all this can be attributed to the rising technological advancements of the second millennium. Along the same timeline, the inclusion of KM as a pivotal partner in productive practices inside companies and organizations have taken a huge leap to withstand the competition. The inevitable use of big data in a world that is run by networking has also penetrated into KM and its future, making it prone to theoretical and practical evolution on a continuous basis.

Digital transformation is inevitable in the current times. The need of the hour is that organizations understand and realize the importance of potential learning opportunities that may result from the analysis of big data. Organizations with a futuristic leadership have already woken up to the fact that "digital" is the new mantra. They are in the process of taking a stock of their current capabilities and working on a digital agenda to reskill their employees and introduce them to new learning environments and opportunities. They are in full recognition of the myriad changes' customer expectation has undergone during the last decade and appreciate the fact that some major changes will be required to meet them.

The traditional organization trained and updated their employee base by providing technical and managerial skill set training programs from time to time. While recognition of gaps in technical skills could be done using skill matrix and competence models, and appropriate training could be provided; managerial skills could be honed through communication, negotiation, and decision-making programs.

These programs were effective and yielded the desired results until the rate of change in business was incremental and the conventional theories of economics applied on the markets. With the current disruptive changes occurring in business environment across the globe, the need of the hour is development of short, situation-specific, on-the-go solutions and suggestions being provided to the employee, which may be used and referred to at their convenience of time and space.

Organizations' collective knowledge must be digitized and prioritized according to the current demands of the market. Knowledge management needs to be innovative and creative in its approach to adapt and realign itself to the changing information needs of organizations. Setting up

centers to leverage knowledge assets of the organization, data driven insights which aid decision making and alignment of strategy with business objectives will lead to success of knowledge management.

Hence, the quantitative and real-world analysis of the meeting of a robust KM with an emerging big data technology forms the framework of this study. By identifying the correlation between these big data and KM, a connection that links both together could be discovered that shed light on its different functionalities. The results of this convergence for a sole entity can be termed as personal knowledge management (PKM), expanding into customer knowledge management (CKM) and finally into organizational knowledge management (OKM) (Pee & Kankanhalli, 2009).

The same convergence also results in the advent of a new corporate methodology, which is increasingly being used in all forms of organizations; big and small for informed decision-making. This is basically the enhanced version of decision-making, which is infused by leveraging the added potential of existing KM practices and new big data capabilities, but the effectiveness of this intersection lies on how well these two practices mingle and co-exist in a corporate's workflow. It is this co-existence that has to be closely moderated for successful implementation and enhancement of KM by featuring big data as the prime contributor.

Deliberate, timely, and careful alignment of knowledge management with big data is the key to success in the current business scenario.

Limitation and Future Scope

Although big data is gaining attention in research but limited research exists putting big data and KM in one framework; hence, it remains underdeveloped within the KM literature. This chapter is a conceptual study that need empirical testing. The literatures found to the subject in discussion depicted association between big data and only few variables of knowledge management but not all areas have been thoroughly studied. The prevalent studies have only considered a few sectors to demonstrate the association between big data and knowledge management. Thus, there is still a huge scope of testing this linkage empirically in other sectors to understand its effectiveness on other industries. The review of the literature studied between big data and various areas of knowledge management, but its linkage in a broader framework still needs to be empirically tested, which opens up the scope for future research.

Appendix

Linkage between the variables

Title of the research paper	*Main findings*	*Source of literature*
Interrelationship Between Big Data and Knowledge Management: An Exploratory Study in the Oil and Gas Sector	• Generation of predictive knowledge • Improve KM capabilities • Effective decision-making	Sumbal et al., *Journal of Knowledge Management* (2017)
Big Data Systems: Knowledge Transfer or Intelligence Insights?	• Similarity between big data and KM structure	Rothberg and Erickson, *Journal of Knowledge Management* (2017)
Creation of Knowledge-Added Concept Maps: Time Augmentation via Pairwise Temporal Analysis	• High correlation between temporal assessment and subjective assessments	Sasson et al., *Journal of Knowledge Management* (2017)
Cognitive Big Data: Survey and Review on Big Data Research and Its Implications. What's Really New in Big Data?	• Five-trait framework for big data 1. Socio-technical system 2. Data space 3. Data richness 4. Knowledge management 5. Decision-making 6. Sensory/visualization presentation	Lugmayr, Stockleben, Scheib, and Mailaparampil, *Journal of Knowledge Management* (2017)
Facilitating Knowledge Management through Filtered Big Data: SME Competitiveness in an Agri-Food Sector	• Big data consumer analytics helps in tapping explicit and tacit knowledge • Effective implementation of KM processes needed in SMEs	O'Connor and Kelly, *Journal of Knowledge Management* (2017)
Big Data Text Analytics: An Enabler of Knowledge Management	• Empower KM	Khan and Vorley, *Journal of Knowledge Management* (2017)
Big Data and Knowledge Management; A Case of DÉJÀ VU or Back to the Future?	• Pattern analysis and prediction with application of algorithms • Data-driven decision-making • Big data as a contributor to KM	Tian, *Journal of Knowledge Management* (2017)
Information and Reformation in KM Systems: Big Data and Strategic Decision-Making	• Identified four types of data based decisions which aids KM systems in handling big data and advanced analytics	Intezari and Gressel, *Journal of Knowledge Management* (2017)

(*continued*)

(continued)

Title of the research paper	*Main findings*	*Source of literature*
The Concept of Big Data Applied in Personal Knowledge Management	• Five areas of personal knowledge management with application of big data: 1. Time management 2. Computer usage efficiency management 3. Mobile device behavior management 4. Health management 5. Browser surfing management	Liu et al., *Journal of Knowledge Management* (2017)
Big Data and Knowledge Management: Establishing a Conceptual Foundation	• Connection between KM, IC and application of big data and business analytics exists • With advance use of big data knowledge assets can be beneficial	Erickson and Rothberg, *Electronic Journal of Knowledge Management* (2014)
Big Data, Tacit Knowledge and Organizational Competitiveness	• Inhabited knowledge in big data has potential of creating economic value • Major source of competitive advantage	Kabir and Carayannis, *ICICKM* (2013)
Big Data Customer Knowledge Management	• Integration of CRM, CKM and big data as value creation strategies • Increase quality • Improves trustworthiness	Chan, *Communications of the IIMA* (2014).

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