Knowledge Management Framework for Smart Communication and Smart Economy

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ABSTRACT: *Seamless communication within and between cities allows for a tremendous increase in efficiencies, one of which is the way work can be done. When work no longer needs to be carried out only within the confines of the traditional office, it can then be done virtually and this research seeks to explore how communication influences the creation of smart economy through virtual work. This research therefore builds on prior smart cities and virtual work research to establish a framework for evaluating and explaining the relationship between smart communication and smart economy and established the link between connectivity/ communication to mobility, and further shows how the increase in connectivity increase virtual work which in turn leads to a smarter economy. The clear relationships established between virtual work and smart mobility and its mediating effect on the development of smart economy is very valuable for academic and practice.*

1. Introduction

Knowledge Management is defined as the use of different practices and techniques to collect, store and share knowledge including information, experiences and insights with team members. It provides the opportunity to have interactions through work, mentoring or school. Workers can be even more productive because of devices, network access and collaboration tools. Working virtually has catapulted in organizations as more and more people are working from home. It is no surprise that technology is taking over most of the tools in our environment. We have a lot of tools to use to share our work and communicate instantly with our colleagues around the world. The technologies available will change how we work forever. Knowledge Management is defined as the use of different practices and techniques to collect, store and share knowledge including information, experiences learning and insights among the current and future team members. The number of organizations using virtual help is rapidly increasing in the world and provides the ability to collaborate irrespective of place and time.

This paper is a review of knowledge discovery literature. We have reviewed over 30 papers from 1996 to 2019. The knowledge

discovery processes has not changed over a time, the process however has improved and are more technology inclined. We explore the relationship between knowledge discovery process and virtual work, and various knowledge discovery technologies that can be used in virtual workplaces which will be described in the paper. This is the topic is relevant for virtual workplace as it improves the workplace and makes management and distribution of knowledge faster and more effective. We have outlined more about the importance of Knowledge Management which we have provided in this review. Based on the review of scientific research, we identified the knowledge management and discovery technologies that are vital and critical to virtual workplaces.

2. Knowledge Management

Knowledge management is the process of creating, sharing, using and managing the knowledge and information of an organization. It refers to a multidisciplinary approach to achieving organizational objectives by making the best use of knowledge (Heierman, 2019). Knowledge has a strong impact on efficiency, productivity and it is critical that organizations manage their knowledge effectively. BroadVision expresses that knowledge management is very important within an organization as it helps speed up access to information and knowledge, improve decision-making processes, promote innovation and cultural change, improve the efficiency of an organization's operating units and business processes and last but not least it increases customer satisfaction.

Knowledge management systems have come a long way and have evolved from being an optional part of knowledge management to a critical component. (Hajric, 1996) suggests that systems can allow for the capture of unstructured thoughts and ideas, can create virtual conferencing allowing close contact between people from different parts of the world, and so on.

An effective knowledge management strategy enables organizations to tap the diverse knowledge base of virtual team. These teams are more task-oriented, formed for accomplishment of a particular goal and are disembarked once the project is completed.

The knowledge is gained during the process of task execution at an individual level. This knowledge in terms of experience and insights has to be captured and made available to the other project teams as well as future project teams. Thus we see that the key to knowledge management in virtual teams involves providing infrastructure in terms of both technology and social capital

3. Knowledge Discovery Technologies

Knowledge Discovery Technologies presents researchers and practitioners in fields such as knowledge management with comprehensive research on the knowledge discovery process. Knowledge discovery technologies is the process of extracting useful knowledge from data. It can facilitate socialization and combination within or across organizations. There is an urgent need for a new generation of computational theories and tools to assist humans in extracting useful information (knowledge) from the rapidly growing volumes of digital data. (Fayyad, Piatetsky-Shapiro & Smyth, 1996)

Skillicorn states that knowledge discovery is used in a way to try and prevent something bad happening, such as in counterterrorism efforts and crime prevention projects. In many ways knowledge discovery and crime investigation are similar. The aim of knowledge discovery is to extract useful knowledge, whereas the aim of crime investigation is to solve and shed light on unknown aspects of what really happened.

Knowledge Creation Systems can be enabled by the use of data mining technologies. Over the last decade, data mining techniques have been applied across business problems. Hajric also suggests that knowledge creation depends upon the mechanisms described in the subsection on knowledge sharing, combined with the ability to put knowledge into practice in an environment which supports interaction and experimentation. The creative process is a delicate one, and it is easily ruined by 2westrict adherence to rules and regulations, or by bureaucracy. Similarly IT systems must be implemented with care, and not attempt to replace processes vital to knowledge creation.

4. Old and New Knowledge Discovery Technologies

Knowledge discovery in databases (KDD) can best be described as huge volumes of data – and particularly documents – are available, without any specific intended use. By using some data sources, four types of knowledge discovery are produced. hese four knowledge discovery types are applied to the most suitable type of crime investigations and the most suitable methodologies, since each crime investigation focuses on different types of findings and knowledge discovery. (Ozgul, 2013).

The figure below shows the step-by-step process of how Knowledge Discovery in Databases works:
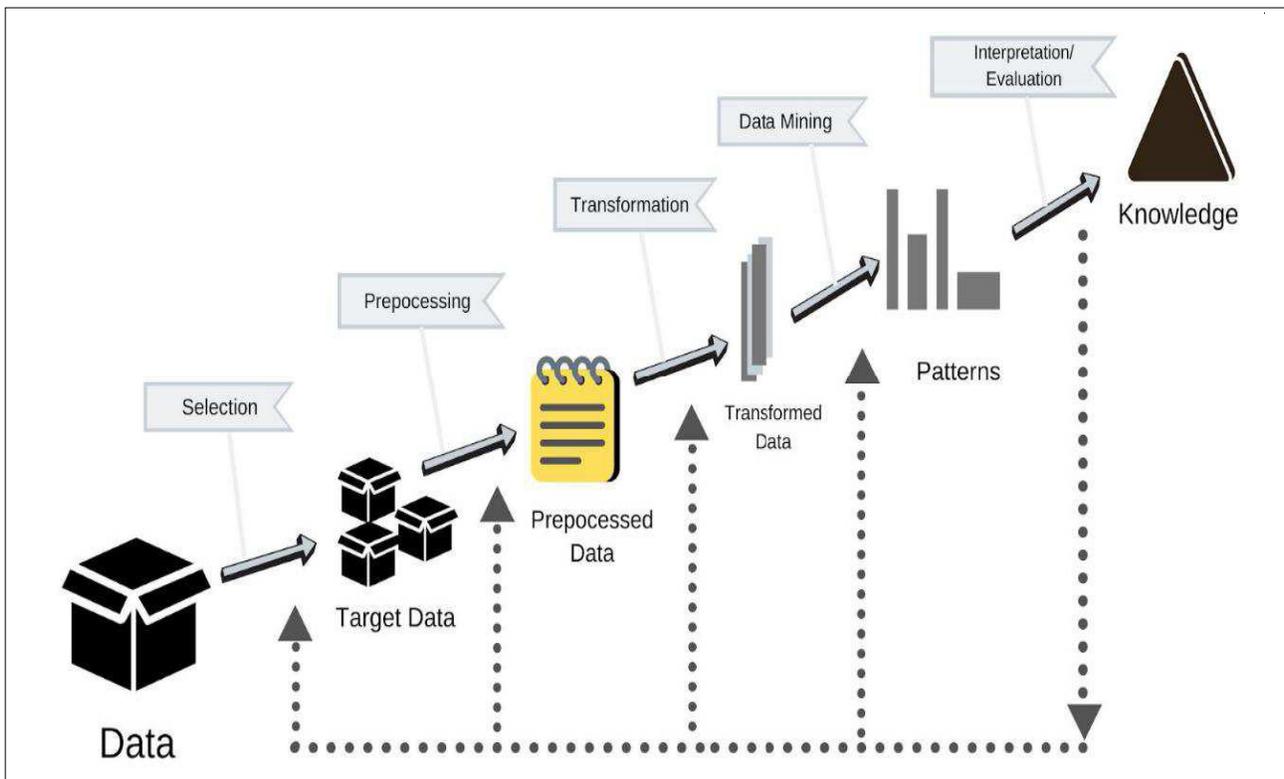

Figure 1. Sourced from Fayyad, Piatetsky-Shapiro & Smyth, 1996

5. Virtual Workplaces

A virtual workplace is a workplace that is not located in any one physical space. It is usually in a network of several workplaces connected technologically (via a private network or the Internet) without regard to geographic boundaries. It really has helped to close the gap of distance, time and society age. In the virtual work environment, individuals must accommodate global timelines while balancing personal time schedules.

The virtual workplace is a working space without walls and boundaries, created with the help of IT that allows the work to take place at any time of the day (24 from 24 hours), in any location and that connects people and information no matter their location (Keohan, 1995).

According to Nader, Shamsuddin and Zahari (2009), there are four categories of teams:

1. Teleworkers: A single manager of a team at one location.

2. Remote team: A single manager of a team distributed across multiple locations.

3. Matrixed teleworkers: Multiple manager of a team at one location.

4. Matrixed remote teams: Multiple managers across multiple locations.

The four features of effective virtual team leadership as suggested by Shachaf and Hara (2005) are:
1. Communication: The leader provides continuous feedback, engages in regular and prompt communication, and clarifies tasks.

2. Understanding: The leader is sensitive to schedules of members, appreciates their opinions and suggestions, cares about member's problems, gets to know them, and expresses a personal interest in them.

3. Role clarity: The leader clearly defines the responsibilities of all members, exercises authority, and mentors virtual team members.

4. Leadership attitude: The leader is assertive yet not too "bossy," caring, relates to members at their own levels, and maintains a consistent attitude over the life of the project.

Virtual workplaces provide a lot of advantages for both individuals and organizations.
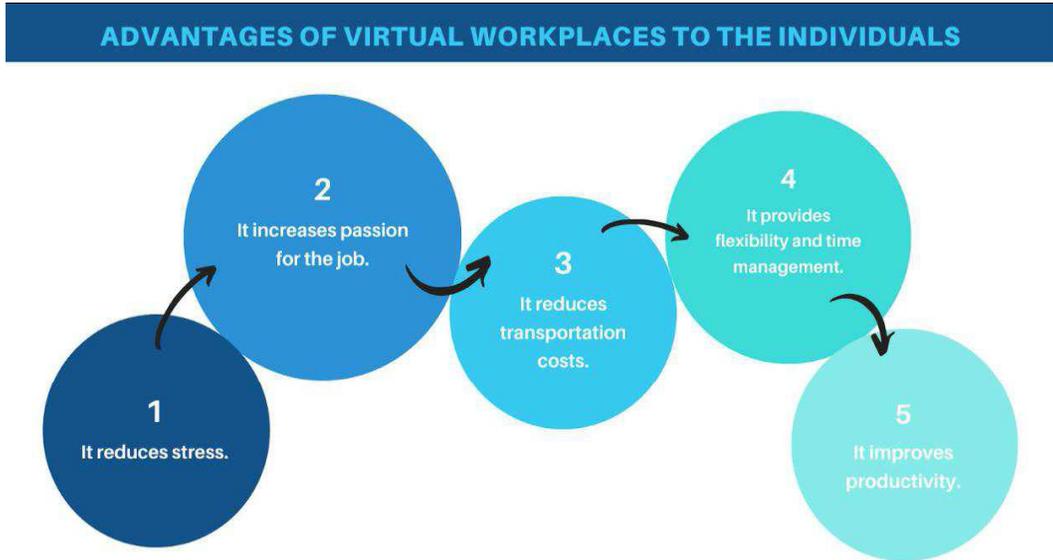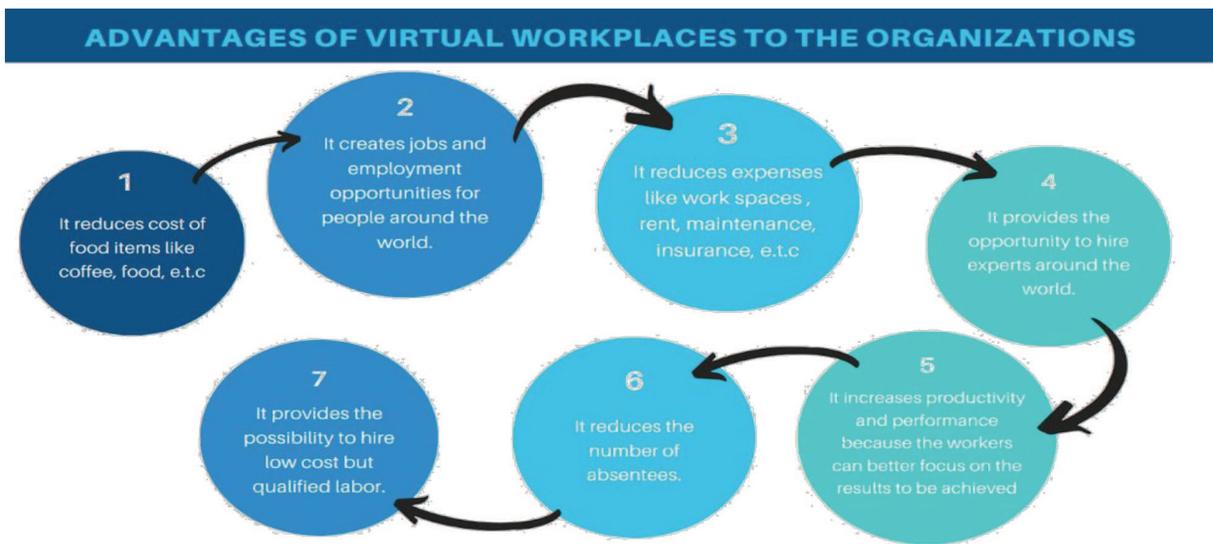

Figure 2. Generated by Authors

Figure 3. Generated by Authors

An effective knowledge management in virtual teams involve capturing and sharing of higher quality and quantity of information. There are two important inputs for effective knowledge management in virtual teams: use of appropriate communication technologies and human coordination.

Prachi Juneja provides some of the effective techniques for knowledge management in virtual teams:

1. A central knowledge repository should be hosted as a shared folder, forum or application. This repository should be easily accessible to all.

2. Virtual team members should be encouraged to document their key experiences and learning during the task execution.

3. The knowledge sharing should take place on a regular basis and should involve exchange of information related to how, what, when and by whom. There are technologies can provide services like project management tools (such as meetings), real-time communication tools (such as video-conference) and meeting productivity tools (such as polling) for effective output.

4. The leaders should empower team members, promote freedom of dialogue, avoid bureaucracy and persuade learning and application of newer skills and ideas.

5. Fostering trust and integrity among the team members plays a major role for members to share knowledge among themselves.

According to Hugh McCullen, the disadvantages of virtual training are:

1. It creates cultural mishaps or language barriers.

2. It lacks in-person verbal communication.

3. It lacks trust established through personal interaction.

4. It lacks social interaction.

Thus we see that the key to knowledge management in virtual teams involves providing infrastructure in terms of both technology and social capital.

6. What are the technologies that enable us to manage knowledge in the virtual workplace?

We are more connected that we have ever been before to people and our jobs. Technology is the solution to a lot of the workplace problems even though it has it downsides. People are able to collaborate easier because of the technology that is emerging. It provides the ability for people to do their jobs easily and effectively. There have been several attempts to identify technologies that enable management of knowledge generally within an organization.

5.1. Artificial Intelligence

Artificial Intelligence technology is presently showing the speed at which employees are accepting and embracing AI. Although this causes a consequential problem for organizations around the world, it also comes as an opportunity to help employees prepare for the changing corporate landscape. AI and machine learning provides supervisors or teachers to check the works of their employees or students. Gautam (2019) states that automated responses to the work provided. It gives the opportunity for better communication and supervision and provides awareness among organizations in terms of employee training and development. It also delivers more personalized training depending upon individual learners' needs.In today's market, organizations want instant results and expect real-time feedback on everything.

5.2. Smart Products

Smart products provides accessibility to the employees. Technology has made it possible to supervise without being there in person. Business and work can be handled online using technology like virtual assistants, smart tvs and microphone systems. Seminars, classes and meetings can all be held online. Smart offices are becoming more and more relevant as Internet of Things devices invade more of our productive work spaces. Crisostomo (2018) explains how these products can be hard to sell to consumers, despite the potential gains, especially when we consider the costs. Smart voice assistants provide wide applications, they aren't used in a universal manner. Not all people order online with Amazon Echo and Google Home doesn't have as much support from third-party devices as it should.

5.3. Virtual Training

In order to create a significant virtual training program, organizations have to consider a lot before diving into it so as to make the most of virtual training. We have to incorporate in-person sessions for discussion or activities that would be best suited to

group settings by dividing training sessions into parts in order to accommodate everyone's schedules. Virtual training provides learning and sharing of information through social media channels, supporting peer-to-peer learning, collaboration and immediate feedback. It makes organizations consistent and provides the opportunity for people to attend via the internet from all over the world. It has made it possible for people to go to school, work online and from the comfort of their homes.

7. How do these technologies enable the management of knowledge within the virtual workplace in the organizational context?
Cloud computing and Artificial Intelligence are some of the technologies to manage workflow, knowledge and knowledge management. In a virtual workplace with workers around the globe, using these technologies as an organization will help you better manage the knowledge. These technologies will help everyone keep in touch and up to date about everything. The technologies can also have security parameters around them so as to stop perpetrators from accessing and / or changing the organization's data. An organization's supervisor can evaluate and correct data and / or knowledge for any of his/her colleagues from anywhere in the world using the technologies provided to us. This data can be used to improve or change the management styles that are not working which in return will boost the organization's earnings and productivity. For a virtual workplace to reach and exceed its' fullest potential, knowledge management technologies are a necessity as it will categorically improve and change a workplace for the better.

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