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Cloud Computing, Intelligent Business Process Management and Artificial Intelligence

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ABSTRACT

We explore the current essential trends of hardware platforms that have a highly impact on firms and help them to be cohesive and organized; which are Cloud Computing, Intelligent Business Process Management (IBPM) and Artificial Intelligence. Also, this paper highlights their impacts in the future and how Business Process Management and companies will get benefit from them. The studied trends have introduced a business process management world changing structure into the business industry. The cloud computing carves the business process through minimizing the workload and maximizing effectiveness in different areas. Intelligent BPM is very efficient in the business industry and market which helps bring real-time visibility into business operations through improving the performance of the organization. We notice that these trends will have a bright future.

Key words: Cloud Computing, Intelligent BPM, Artificial Intelligence, Hardware Platforms, BPM

INTRODUCTION

Nowadays, most of the companies depend on technology to run their businesses; they looked for a fast, reliable and qualified ways for their operations such as Cloud Computing, Intelligent Business Process Management (IBPM) and Artificial Intelligence (AI). Each of these trends is consisting of client machines and server machines, modern mainframes that manufactured by IBM and top chip producers (Laudon and Laudon).

They have many important common features that poised to transform businesses across a wide variety of sectors. Managers can get benefits by raising the efficiency and effectiveness of their company with some activity such as researches and developments and revenues recognition (Beston, 2016), Also they can boost business decision making, predicting and controlling the relationship with customers so can increase their satisfaction (Hyken, 2016), they can manage and avoid any risks that may face even before the risk arises.

These advanced systems help companies stay organized, productive with low costs. Keeping up to date with technology and employing the right technology with implementing new process can help company growing for long terms without facing any issues. Additionally, this cloud services save costumer's information secretly without needing to paper files.

BACKGROUND

Cloud Computing is storing and entering data thru the internet. It is been around since the fifties; because of the high cost of the CPU and needing for more information was hard to them to develop it. Cloud computing now offers many options within the browsers without needing to use the resource, it can also be shared or private and reduce IT investment with a low security and reliability (Laudon and Laudon). Apple is the best example of developing iCloud, they allow their users to sync their photos with devices (Prakash, 2016).

John McCarthy is the father of the term Artificial Intelligence (Prakash), and this term means to create machines that eligible to simulate human intelligence, it is much easier to use for companies because it can absorb many tasks without blemishes than human workers do. Google is focusing on machines which helps advance Google's language, speech translation, visual processing, ranking and

prediction capabilities ("Top 20 Artificial Intelligence Companies - Datamation").

Intelligent Business Process Management (IBPM) provides companies having intelligent business operations with the necessary facility. Gartner Group described its components, including human interaction management, connectivity and content interaction management (Fischer, 2015).

LITERATURE REVIEW

Much research has been described how the trend of platform such as: cloud computing, AI and Ibpm has huge impact on today's business management (Daugherty, 2016, Megersa & Zhu, 2012, B & H, 2014, Khoshafian, 2014). Some articles have mentioned only one platform to focus on its beneficial more than the others. The cloud computing had been indicated in the first article as the future focal point data framework development due to improvements which occurred in the field of computer hardware specially in the last decades. As enablers of cloud business are already taking innovation across the value proposition of customer and value chains of the industry and organization. Organizations apply the platform cloud to upgrade their process, create productive coordinated effort amongst units, amplify and develop new client esteem recommendations (B & H, 2014).

Moreover, another article agrees on focusing on such platform by adding a valuable and particular point to the previous discussion. It indicated that cloud computing can add value to companies to competitively and efficiently perform because searching continuous improvement has been the focus of business nowadays facing ever-changing business world. In addition to that the incorporation of BPM with cloud is a promising way to empower small and medium scaled organizations to stay focused and compelling in their business (Megersa & Zhu, 2012). Other authors such as Daugherty indicates that AI could be the most distortable technology that the world has seen since the revolution in industry. But when looking from the reality it is positive that will change how we cooperate with our general surroundings. It will enhance how we conduct business, as well as the sort of work we conduct in addition to releasing new levels of imagination and inventiveness. Adding to that provided reports from projects that AI advances in business will help enhance by 40 percent in labor productivity.

As opposed to undermining individuals, we trust AI will strengthen its part in driving business development. As AI develops, it will conceivably fill in as an effective counteractant for the productivity stagnant and deficiencies in skilled work of late decades. AI is prospering now due to the ascent of computing widely, cloud service low cost, close boundless cheap storage, new calculations, and other related innovation developments (Daugherty, 2016). On the other hand, iBPM has been indicated also as one of the most effective hardware platforms through a research conducted by Khoshafian. He divided the benefits into three categories: Business benefit, operator benefit and customer benefit in each of them there was a significant points that really supported such platform. And as we are in this research mentioning benefits regarding business the most significant benefit that could provide is the "foundation for Business Transformation". The iBPM stage and methodologies that are agile are transformational in light of the fact that they empower enterprises to reevaluate and change all parts of the business. As the endeavor develops in sending iBPM arrangements or solutions, it will have the capacity to accomplish a beat of switch that can stay aware of client desires, demand in market and changing directions and in addition encourage social changes and advancement (Khoshafian, 2014).

METHODOLOGY

Research design

The following paper aims to discuss briefly about the current essential trends hardware platforms which are Cloud Computing, Intelligent Business Process Management (IBPM) and Artificial Intelligence. In addition to that each of these hardware platforms is discussed individually regarding definitions, types, benefits and the reasons behind its importance for companies whom adapt such platform. The paper will have focus at last to sum impacts for these trends in future and how Business Process Management and companies will benefit from them as well as.

Data collection

In the provided research, the presented information is both quantitative and qualitative information. In addition to that most of the data are taken from a secondary data such as PPT, reports, articles, news and interviews.

The collected information from the secondary data was different. In each section a key point of view was provided to strengthen the view that we are concentrating at in order to support our presented information. The articles were provided to give more reliable information for such aspects and to answer the main question of our research. Articles had reports and surveys that helped in giving us more realistic and valuable points that we added in this research.

We also visited some websites to get more understanding and information to help in organizing and advantaging the ideas regarding the topic. In addition to knowing more about the topic itself or in other words updated information regarding such topic. In addition, not to forget the website news that helped by including some names of books and reports linked to get full understanding regarding hardware platforms and their benefits in business.

Data analysis

Moreover, after collecting all of information regarding the three platforms we made sure that every single data collected is an accurate. A double-check was done after reading the articles founded on websites by going through the resources provided within the article to get more understanding. When the following procedure was accomplished, ideas and themes that are the same were put in group and provided in the right section of the research. After this was completed a final review was performed to the data in each section. Information that had unique view was given a special space to discuss it in detail.

CLOUD COMPUTING

Cloud computing is a computing shifted with the help of the Internet. The Internet technology advances assisted in moving many IT activities to a service provider. Cloud computing helps in sharing information across the company and creates a competitive advantage for organizations using such services. Also, cloud reduces the hardware expenses while providing the ability to expand according to the need (Lloyd *et al.*, 2015; Haghighat, Zonouz, & Abdel-Mottaleb, 2015).

The history of the cloud starts with the Internet establishment by thirty years. In the early 1990's, the introduction of the VPN (virtual private network) gave the first contrastive improvement toward having the cloud. In 2006 Amazon introduced the Elastic Compute Cloud and following them two years later was the Azure windows. Garner in 2008 conducted research that concluded that IT related products demand would increase and the cloud will help shape these progressions. Nowadays, companies are shifting to the cloud to gain a competitive advantage in the markets (Rochwerger *et al.*, 2009; Heilig, 2014).

The Cloud computing evolved into three main services, which are IaaS (infrastructure as a service), PaaS (platform as a service), and SaaS (software as a service) (Katzan, 2009). Also, a new fourth trend called MBaaS (Mobile Backend as a service) is recently being used. This section discusses all the four aspects of services with examples in business. The services vary from one another starting with an essential IaaS to SaaS. Each service is dependent on the one before, for instance, if the infrastructure is available then a platform to run the software is needed. Figure 1 in the appendix shows the three models.

IaaS: Infrastructure as a service

The IT infrastructure comprises of the hardware, software, servers, networks and human resources to run the IT related works. The IaaS ends the need to establish an infrastructure in the company's premises. Also, the work on expansion is unnecessary because the service provider can expand with the need of the organization. Giving the service more of a utility type depending on the usage of the specific time period. (Katzan, 2009)

PaaS: Platform as a service

The cloud PaaS is a data solution model. PaaS offering makes the processing of large-scale datasets in the cloud easy and cost effective. Enormous use was in the direction of application development platforms, for example, Google App engine and

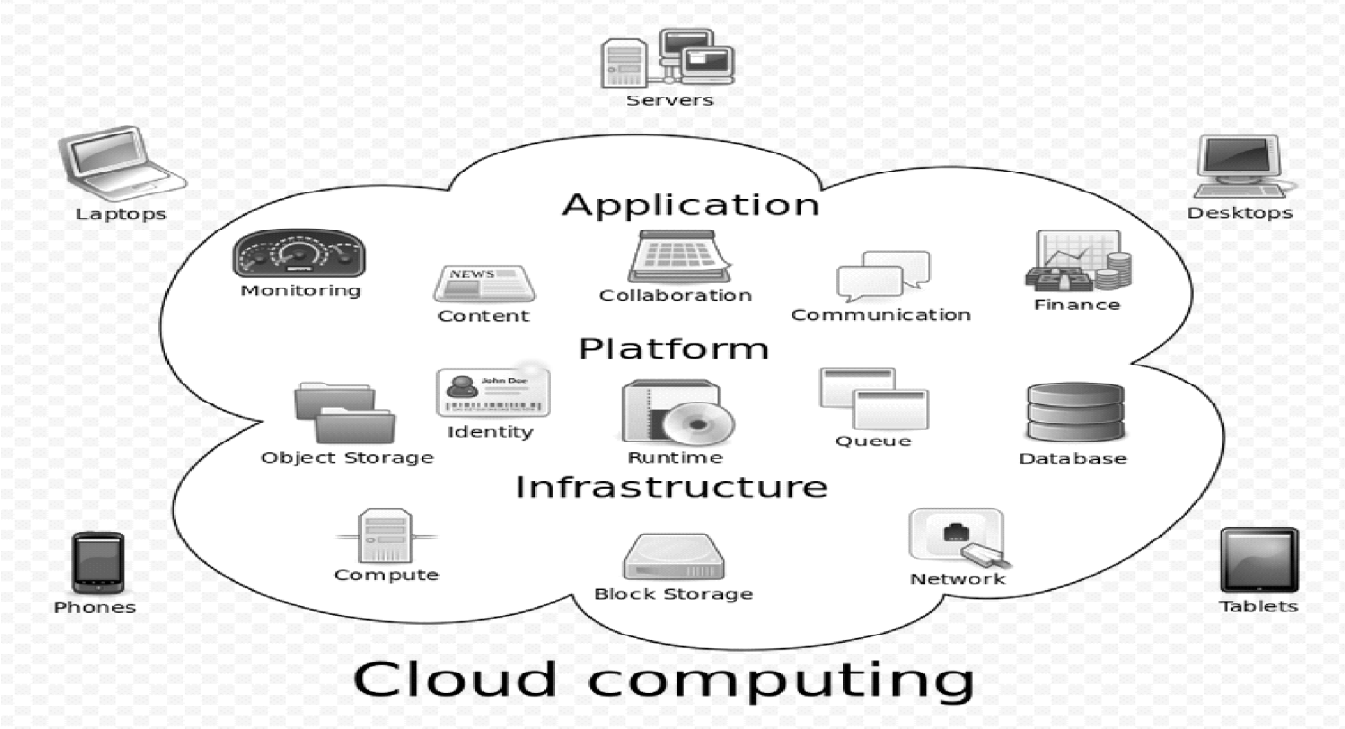

Figure 1: Cloud computing (Johnston, 2009)

Microsoft Azure. PaaS service providers develop channels of distribution and payment methods services. The service providers scale up the storage and computing power according to need with manual modifications by the user (Smedlund, 2012).

According to Rodrigo *et al*. (2017), cloud elasticity can bring benefits to parallel applications, besides the traditional targets including Web and critical-business demands. Users do not need to figure out the best choice for them in advance because the system can adapt the number of resources and processes at runtime. They provide a lightweight plug-and-play service at the PaaS level of a cloud, in which users are completely unaware of the elasticity feature, only needing to compile their applications with Helpar prototype.

SaaS: software as a service

SaaS provides users with software and database with the benefit of an option to expand software being provided. The needed software is activated according to the need and payment for such service is done per-use. Users of the SaaS don't need to download any software and instead they run the application through the cloud. This eliminates any extra cost of infrastructure, platforms, and software. One issue with SaaS is the location and security of the database of users' information (Katzan, 2009; "IEEE Cloud Computing Special Issue on Cloud Security", 2015).

MBaaS: Mobile backend as a service

A mobile backend as a service provider supplies the user management, push notifications, and integrating social media services to app developers. With MBaaS the app developer can use cloud storage and application software to support their application (Mell & Grance, 2011).

Deployment models

Figure 2 in the Appendix illustrates the three deployment models of the cloud. These models identify the users and importance of the data. There are public or external cloud, private or internal cloud, and hybrid cloud. This is a further discussion on the three models of deployment (Chapman, Emmerich, Márquez, Clayman, & Galis, 2011).

Private Cloud

Private cloud is an infrastructure cloud that operates for one single company and its BU (business units).

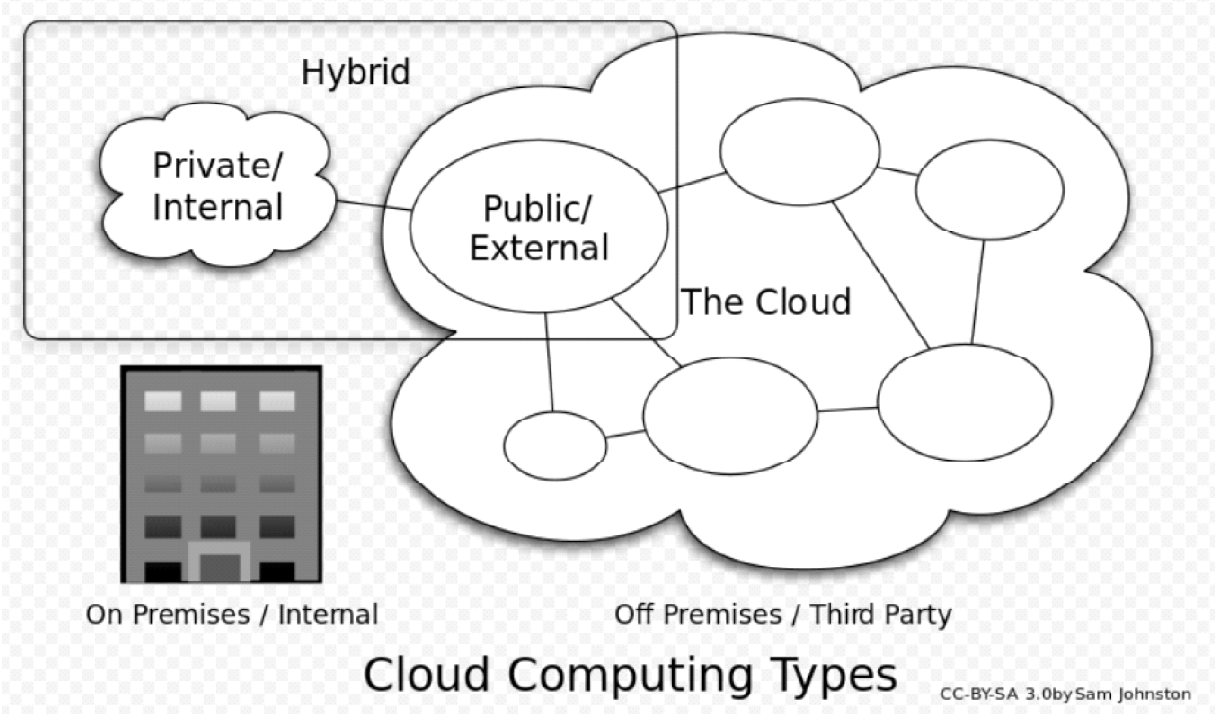

Figure 2: Cloud computing types (Johnston, 2009)

Such a cloud takes care of the of all the cloud requirement for the company. Such clouds are self-run by the company including hardware, software, platforms, expansion, and maintenance (Chapman, Emmerich, Márquez, Clayman, & Galis, 2011).

Public Cloud

Public cloud is a cloud used by the public. The range of this cloud starts with free services like Google Drive, And services like Amazon web services and Microsoft Azure. These services are done for a specific price depending on the service. Such clouds are off premises and mostly conducted by a third party (Chapman, Emmerich, Márquez, Clayman, & Galis, 2011).

Hybrid Cloud

Hybrid cloud composes of one or more clouds either public or private. Hybrid cloud comes in use when dealing with sensitive customer information that would be stored on the private cloud and the public cloud like storage and interfaces (Chapman, Emmerich, Márquez, Clayman, & Galis, 2011).

Misunderstood advantages of the cloud

The cloud computing provides new opportunities to the organizational competitive advantage. While many might argue against the cloud due to possible hack attacks or loss of connection to the Internet, all the advancements are moving toward the cloud. There are three main points that many CEO's don't understand.

Cost

In a study conducted by Granter, cost of the IT department in an organization is 3.4% of the total cost of any organization. And the shift toward cost is 114% higher than organization IT cost. Therefore, the cost of the shift is 3.8% of the total cost. The benefits that comes with the shift or significant and important. Such benefits are the need to pay for improvement and the IT related maintenance cost.

Reliability

The shutdown of a server due to any reason is considered a loss to the company. In an incidence, Amazon servers were shut down due to an outage.

This created a major concern, but Netflix did not have any problems even though they used the Amazon Service. It is said that Netflix followed Amazon notification to develop a back-up for any uncertain occasions. Netflix called its program Choas Monkey for the sole purpose to overcome the incidence that occurred. Therefore, following up with the service provider and exerting efforts to have a back plan can help companies to be ready and eliminate any reliability concerns.

Security

There are two problems surrounding the cloud and they are breach of the cloud and the employee access and removal. In a study conducted Penomon (2014), ninety percent of security companies are breached. And the employee access to information is regarding the change of management and employee authorization. And in a removal is how fast the employee authorization can be removed from the system (Haghighat, Zonouz, & Abdel-Mottaleb, 2015).

INTELLIGENT BUSINESS PROCESS MANAGEMENT

According to Khoshafian (2014), iBPM is a transformational method that assist firms accomplish their main objectives. iBPM extends multiple repeated stages, from plan to execution to checking and continuous improvement. It plays a main part in process enhancement and organization structures. Probably above all, iBPM helps firms accomplish powerful customer centricity through automating their strategies and systems. The development of iBPM was a long journey. iBPM developed from advances in process enhancement, business revolution, work automation, business regulations, examinations, organizations structures, the Internet, and social cooperation. The iBPM methods and advances are empowering the development of the "adaptive organization." Using iBPM, an adaptive organization constantly supports its business goals to operationalized strategies and procedures with full translucency, clarity, and control. Most significantly, an adaptive organization is energetic and proactive in reacting to change. Eventually, change is the only continuous thing in business (Khoshafian, 2014).

Benefits

In general, everyone benefits from iBPM including the customers, operations, business and IT. Benefits for customer in term of transforming the customer experience, they will have consistent customer experience tailored to their needs. Benefits for operations, operator knowledge, worker or CSR (Corporate social responsibility) are empowered to focus on the task at hand with adaptive Next-Best-Action, Real-Time Lean Six Sigma. For the business, the ability to respond to market demands and build and adapt for change at lower costs. For IT, high productivity environment enables IT to adapt and deliver on promises (Jakhar, 2014).

How it works

In order to build an efficient implementation roadmap to produce the best iBPM, a financial institution needs flexibility, reactive items, and risk mitigation. The current maturity level of the organization operation process is also an important factor to consider while preparing for the journey. To achieve the institution agility, organizational processes must be visible and continuously examined to match the shifting in the market needs. Below are examples of how implementation might work:

Decision management services are included into the workflow to recognize repetitive patterns and thus instantly change these patterns into a business rule, without the need to change the whole process.

Health insurance premiums rely on two kind of data, statistical such as life history, health and age, and social such as sports preferences and eating habits. For example, if a person expresses passion for fast street racing, he or she is more likely to pay a higher insurance premium because they have higher chance to face accidents (Jakhar, 2014).

The challenges and the breakdown of the process

According to Jakhar (2014), the two main barriers to success in the iBPM market are high cost and the absence of awareness of its business value enunciation. For example, the main challenges a financial institution could probably deal with during iBPM adoption are:

Absence of organizational readiness. The majority of financial institutions have a top-down

enterprise architecture. This restricts the decision-making ability of front-line workers to constantly enhance business operations. To implement it successfully and effectively, it is essential to acquire management sponsorship first, and then include both IT and business.

Justification/alertness of iBPM business value enunciation. A prime barrier to setting up intelligent business processes is the absence of understanding how iBPM can achieve business value. This challenge should decrease when the iBPM implementation gains power and verify its significance for business strategy and success.

Merging silo systems. Another major barrier financial institutions deal with is the presence of exchanging data over various disparate systems. As a consequence, decision-making procedures are tied to silos rather than pollinating over business processes. Organizations have to keep up with these various systems to change choices into remedial actions.

Cost/return on investment (ROI). Despite the fact that iBPM provides major opportunities for achieving benefits, the high cost of implementing iBPM could cause slower adoption over financial institutions (Jakhar, 2014).

How it is helpful

In a financial institution, it could enhance operational risk and react faster to discovered thefts and frauds in two ways:

- Firstly, according to advanced analytics. iBPM recognizes potential business hazards, therefore, corrective action could be taken at the right time.
- Secondly, for the situation of secured loan as an example, iBPM allows mitigating hazards through monitoring asset valuation in real-time. Mortgage loan originator will get a notification as soon as the value of the asset decreases beneath the loan value. Since iBPM solutions afford both human and system intelligence it allows businesses to be more simplified and flexible. In the financial sector for example, iBPM solutions could handle the rising need to be more reactive to external events. The points below represent main drivers of this rising demand for intelligent business processes.
- Mobile technology: It could enable the labor force by allowing immediate access to processes do deliver anywhere and anytime.
- Social media: organizations could benefit from social media potentials and turn feedback into actions, thus enhancing employee productivity.
- Big Data: Businesses could use the power of big data to push operational effectivity, design customized products or services, and make better decisions.
- In addition, organizations transform their key processes and implement intelligent business processes management into their daily business operations it results in faster growth and innovation (Jakhar, 2014).

Effects on business

IBPM affects the businesses in term of focusing on creating and providing solutions, including:

Business Objectives: organizations have goals. These are usually measurable goals for example, Key Performance Indicators (KPIs) to increase the income, decrease costs, or raise customer satisfaction. With iBPM, the organization could shift down from an intensive KPIs to automated business processes, which will result in getting a full vision and control.

Business Requirements: organizations have requisites that should be automated and operationalized. However, iBPM and businesses cloud have a mutual most widely used language with IT and immediately understand their needs in the iBPM tool.

Context for Business Assets: organizations need to serve their customers in a special way, according to a specific set of requirements. It could offer the unique situations and particular resolutions for their particular clients or lines of products/services. Through using it, companies could simply reuse and customize their business resources.

Innovation and Change: organizations should be innovative and creative to compete with their peers. Also, they have to be able to present change, and

perform it rapidly to react to market demands. In addition, it is the perfect platform for innovative and creative products and services. Most significantly, iBPM let companies to be flexible and reactive to changes in business goals, customer reactions, and economic situations. However, iBPM arrangements are about automating business processes. Also, it empowers the business to straightly catch their goals and to deal with change. This change could occur by easy-to-use process designing structure for example, business goals, process, and case designs. Using iBPM, the organization has the ability to introduce changes directly to meet their goals (Khoshafian, 2014).

ARTIFICIAL INTELLIGENCE

Artificial intelligence is a field that has quite a long history, but is constantly growing and actively changing in this age. To be precise, artificial intelligence refers to the development of computer systems equipped with the power to perform activities and tasks, which normally require the intelligence of a human being. Artificial intelligence can also be explained as the tools or programs which are aimed at improving the human output when it comes to specific activities. For the past four decades, the field has been undergoing increased attention and exploration. The initial idea on artificial intelligence can be traced back to a conference held during the summer of 1956, at Dartmouth College. The event turned out to be one of the influential factors in the development of artificial intelligence. The use of artificial intelligence has been embraced as one of the most effective innovations and technologies of the 20th and 21st centuries.

One of the trends that has been noted about artificial intelligence in the year 2016 is the breakthroughs in emotional understanding. Artificial intelligence has associated with the power to detect human emotion. This is one of the most important areas of research this year, and more resources are being devoted to try and accomplish this. The ability of a computer to understand speech shows that there is a possibility in the creation of a 'seamless' interaction between a computer and a human being (Reese, 2015). Companies such as Apple and Microsoft have equipped their mobile phones with Siri and Cortana respectively, and the applications are meant to help the users with any issue that they may be experiencing on the smartphones. The applications also play a significant role when it comes to helping the users of the phones carry out tasks such as writing a message or calling someone through the use of voice command. The increase in the availability and development of products such as accurate cameras, facial and voice recognition, and computers that are in a better position to detect the emotional stability of the user only shows that with time, artificial intelligence will be used to detect human emotion.

The second trend is the use of artificial intelligence in shopping and customer service. Businesses are starting to use artificial intelligence to figure out what makes the customers happy or unhappy. The use of artificial intelligence in this way has proven to be quite beneficial to the businesses already using this system. In the business world, the equal to Siri is known as Watson. Watson is more effective compared to Siri due to a number of things. First, the former is targeted for the business world, and therefore, the responses that one receives are not only from a database, but are also cognitive. Watson is designed in such a manner that it can respond to questions with good information, and in a way that can be identified as a human-like fashion, both verbally and in text (Hyken, 2016). The added advantages that come with the use of artificial intelligence application tools such as Watson and Siri have been used to greatly increase shopping and customer service offered by companies.

The third trend that can be identified in the field of artificial intelligence is the ethical considerations that are involved with the development of the technology. The use of artificial intelligence is being used to develop new technology like self-driving and self-parking cars. The use of artificial intelligence in such ways has greatly been approved and appreciated in this world. However, in the process, the developers of artificial intelligence are forced to put in some ethical considerations. For example, for driverless cars, how can they maneuver an accident or the case of an animal appearing on the road out of nowhere? Considering that it is impossible for the automobile to make a prompt decision, it must have a well

stipulated code that can guide it on how it can deal with such a situation. In this case, the code written by the developer of the artificial intelligence system to be used by the driverless car poses one question; is the life of the animal worth more than that of the passenger (Reese, 2015)? Therefore, the developers of artificial intelligence are faced with such ethical considerations when it comes to the development of technology.

FUTURE RESEARCH DIRECTION

Cloud based cross-system integration

Balina, Baumgarte, and Salna (2017) investigates the architecture of different cloud based solutions for knowledge management to define the possibilities of cross-system integrations.

In authors' opinion, usage of IT is one of the major factors for ensuring the growth and competitiveness of enterprises, as well as it also benefits the effective knowledge management within the organisation. Certainly, there are large-scale knowledge management systems (KMS) covering the full functionality for expediting the effectiveness and productivity of employees. These systems are frequently integrated into other organisation's management systems. But the most of the small and medium-sized enterprises (SMEs) cannot pay for using these KMS, and also the full functionality of these KMS is not compulsory for them. The authors suggest combining the parts of cloud based KMS with business process information systems that jointly propel the business core of the enterprise.

Big data - a major enterprise force

Addo-Tenkorang and Helo (2016) investigate big data, its application and analysis in operations or supply-chain management, as well as the trends and perspectives in this research area. They found that big data is increasingly becoming a major organizational enterprise force to reckon with in this global era for all sizes of industries. It is a trending new enterprise system or platform which seemingly offers more features for acquiring, storing and analyzing capacious data spawned from various sources to obtain value-additions.

The authors propose a value-adding framework through discuss the main issues of big data and its extension into "big data II"/IoT–value-adding perspectives.

Cloud security

Cloud computing has become very active in the recent years. It changes the internet computing infrastructure and the mobile applications. Mobile devices are being evolved continuously and rapidly. The cloud computing is expected to conduct innovation into mobile computing by utilizing the cloud computing in the mobile devices for data processing, storage and other intensive operations.

The Cloud is a risky paradigm. For instance, the use of Cloud services, which usually are external assets to their consumers, implies unprecedented risks that must be taken into account because it can be attacked by hackers. The second threat is the risk of sharing storage data; the cloud computing realizes sharing and storage computing through virtualization but the applications are not secured so there is a risk that resources are used indiscriminately which leads to data leakage or loss. The misuse of the cloud computing can create problems since the computing resources can be provided with lower cost using the cloud computing services the hackers can use the resources to send a spam that will cause blacklist of the network address and interruptions of the service (Tang, 2014).

Ramachandran & Chang (2016) advise cloud data security models based on Business Process Modeling Notations (BPMN) and simulation results can divulge performances issues related to data security as part of any organizations initiative on business process management (BPM).

Intelligent BPM

Peter Druckter said once: The best way to predict the future is to create it. iBPM can help predict the future, and here is where predictive analytics play a role. Since businesses have a lot of hidden treasures within their information. The information can be held in operational database, warehouses of data or even evaluation or openly accessible data. There is valuation in the individual resources of data, however much more so in their mix. The client patterns of

purchases, fulfillment drivers, and the behavior of the future are altogether unrevealed in this data. The entire reason for, and inspiration for, predictive analytics is to find those patterns (predictive models), utilize them to predict the future behavior, and then react based on the understanding (Sinur, 2013).

In the future, intelligent business process management is going to be used in many industries, especially the financial industry. Financial institution will be able to advance operational risks and react rapidly to fraudulent action in the following methods; depending on advanced analytics, intelligent BPM assists in recognizing potential risks so restorative activity could be executed. For the situation of secured loan, intelligent BPM will help in mitigating the risks through monitoring valuation of the asset progressively. The loan officer will get an alert when the asset value drop under the amount of the loan (Dunie, Schulte, Kerremans, & Cantara, 2016).

CONCLUSION

Organizations are turning to the cloud in order to redesign their core business processes. The opportunity for process innovation is immense with the disciplined approach of BPM. The cloud shapes business process management by decreasing the workload and increasing effectiveness in different areas. It shows that cloud computing can save life as it was implemented in health industries to retrieve patient history in emergencies. We believe that there's a bright future for the cloud computing since it is being performed in many places and it will be implemented in various different industries in the future.

Artificial intelligence has been connected with making life easier and tasks accomplishment simpler, but many people have a concern towards the AI because they feel being threatened of losing their jobs. However, an in-depth look at the development and progress of AI tools and applications reveals that more opportunities are presented by the technology compared to the associated challenges. The use of AI in the future is expected to continue improving the approach to basic tasks and activities. We agree on the improvement of the technology under one condition that is by not totally replacing humans by machine, as humans have a significant role in running those systems, providing services and locate errors in order to enhance those systems.

It was discussed that Intelligent Business Process Management is very efficient in financial market. Its real-time visibility into business operations by improving the performance is obvious. Intelligent BPM will help financial institutions, especially banks and insurers, to apply multiple quantitative and qualitative methods in the leveraging process. We believe that intelligent BPM is going to have a great success as it is being implemented in many industries and countries including the UAE's public and privet sector.

REFERENCES

[1] "Top 20 Artificial Intelligence Companies - Datamation". *Datamation.com*. N.p., 2016. Web. 12 Nov. 2016.

[2] Addo-Tenkorang, R. & Helo, P.T. (2016). Big data applications in operations/supply-chain management: A literature review. *Computers & Industrial Engineering*, 101, Nov., 528-543.

[3] Adineh, M., & Hariri, N. (2014, August). Risks Identification and Ranking in Information Technology Projects Based on Cloud Computing. *KCAJBMR Kuwait Chapter of Arabian Journal of Business and Management Review, 3*(12.a), 216-227. doi:10.12816/0018862

[4] Balina, S., Baumgarte, D., Salna, E. (2017). Cloud Based Cross-system Integration for Small and Medium-sized Enterprises. *Procedia Computer Science*, 104, 127-132.

[5] B, H. & H, S. (2014). Business Process Management in Cloud Computing. Academia.edu. Retrieved 2017, from *http://www.academia.edu/9399227/Business_Process_Management_in_Cloud_Computing*

[6] Beston, C. (2016). What Are The Business Impacts of Cloud Computing? *PWC*. N.p., 2016. Web. 12 Nov. 2016.

[7] Chapman, C., Emmerich, W., Márquez, F., Clayman, S., & Galis, A. (2011). Software architecture definition for on-demand cloud provisioning. *Cluster Computing*, *15*(2), 79-100.

[8] Daugherty, P. (2016). Artificial Intelligence May Change the Face of Business - Techonomy.

Techonomy. Retrieved 7 December 2016, from *http://techonomy.com/2016/12/artificial-intelligence-may-change-the-face-of-business/*

[9] Dunie, R., Schulte, W., Kerremans, M., & Cantara, M. (2016). *Magic Quadrant for Intelligent Business Process Management Suites*. *Gartner.com*. Retrieved 5 May 2017, from *http://www.integra-co.com/sites/default/files/Bizagi%20on%20 Gartner%20Quadrant%20-%20Reprint.pdf*

[10] Fischer, L. (2015). *BPM Everywhere*. 1st ed. S.l.: Future Strategies.

[11] Fischer, L. (2013). *Ibpms*. 1st ed. Lighthouse Point, Fla.: Future strategies.

[12] Haghighat, M., Zonouz, S., & Abdel-Mottaleb, M. (2015). CloudID: Trustworthy cloud-based and cross-enterprise biometric identification. *Expert Systems with Applications*, *42*(21), 7905-7916.

[13] Heilig, L. (2014). A View on Cloud Computing from above the Clouds. *Computer*, *47*(10), 8-8.

[14] Hyken, S. (2016, November 5). How AI (Artificial Intelligence) Creates A Better Customer Service Experience. Forbes. Web. Accessed from http:// www.forbes.com/sites/shephyken/2016/11/05/how-ai-artificial-intelligence-creates-a-better-customer-service-experience/#64802107ef2c

[15] IEEE Cloud Computing Special Issue on Cloud Security. (2015). *IEEE Cloud Computing*, *2*(5), c2.

[16] Jakhar, S. (2014, March 18). Leveraging Intelligent Business Process Management to Reinvent Business Operations in Financial Services. *Capgemini*, 1-16.

[17] Karthikeyan, N., & Sukanesh, R. (2012). Cloud based emergency health care information service in India. *Journal of Medical Systems*, 36(6), 4031-6. doi:http://dx.doi.org/10.1007/s10916-012-9875-6

[18] Katzan, H. (2009). Cloud Software Service: Concepts, Technology, Economics. *Service Science*, *1*(4), 256-269.

[19] Khoshafian, S. (2014). *Intelligent BPM the next wave for customer-centric business applications*, 19-41. Retrieved October, 2016, from *https://www.pega.com/sites/default/files/Intelligent-BPM-The-Next-Wave-For-Customer-Centric-Business-Applications_Khoshafian.pdf*

[20] Laudon, K.C. and Laudon, J.P. (2010). *Management Information Systems*. 1st ed. Upper Saddle River, N.J.: Pearson.

[21] Lloyd, W., Pallickara, S., David, O., Arabi, M., Wible, T., & Ditty, J. (2015). Demystifying the Clouds: Harnessing Resource Utilization Models for Cost Effective Infrastructure Alternatives. *IEEE Transactions on Cloud Computing*, 1-1.

[22] McCarthy, D. (2010, May). Cloud Formation Provides Growth for Satellite Players. *Cloud Formation Provides Growth for Satellite Players*, *25*(5).

[23] Megersa, B. & Zhu, W. (2012). Cloud-Enabled Business Process Management. ijcte.org. Retrieved October 2012, from *http://www.ijcte.org/papers/558-A355.pdf*

[24] Mell, P. & Grance, T. (2011). The NIST definition of cloud computing. *http://dx.doi.org/10.6028/nist.sp.800-145*

[25] Prakash, N. (2016). Did You Know Cloud Computing Has Been Around Since the '50S? *Mashable*. N.p., 2016. Web. 12 Nov. 2016.

[26] Ramachandran, M. & Chang, V. (2016). Towards performance evaluation of cloud service providers for cloud data security. *International Journal of Information Management*, 36(4), 618-625.

[27] Reese, H. (2015, December 15). 7 trends for artificial intelligence in 2016: 'Like 2015 on steroids.' *TechRepublic*, 1-11.

[28] Rochwerger, B., Breitgand, D., Levy, E., Galis, A., Nagin, K., & Lorente, I. *et al.* (2009). The Reservoir model and architecture for open federated cloud computing. *IBM Journal of Research and Development*, *53*(4), 1-11.

[29] Rodrigo, R. *et al.* (2017). A lightweight plug-and-play elasticity service for self-organizing resource provisioning on parallel applications. *Future Generation Computer Systems*, In Press, Corrected Proof, Available online 16 February 2017.

[30] Sinur, J. (2013). *Intelligent BPM Systems Impact and Opportunity* (1st ed., pp. 15-18). Future Strategies Inc. Retrieved from *http://www.edmblog.com/files/ibpms-special-edition-emerging-standards-in-decision-modeling-3.pdf*

[31] Smedlund, A. (2012). Value Cocreation in Service Platform Business Models. *Service Science*, *4*(1), 79-88.

[32] Tang, J. G. (2014). The research on cloud computing security model and countermeasures. *Applied Mechanics and Materials*, 511-512, 1196-1200.

doi:http://dx.doi.org/10.4028/www.scientific.net/AMM.511-512.1196

[33] Topic, B. (n.d.). IEEE Xplore Document – Mobile cloud computing as future for mobile applications – Implementation methods and challenges issues. Retrieved November 07, 2016, from *http://ieeexplore.ieee.org/document/6045111/*