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Accounting Information and Digital transformation: The case of services organizations

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Abstract

Services organizations increasingly transforming themselves into digital entities by introducing innovate service and exploiting digital technologies. Not much research had been done in previous years concerning the adaption of digital transformation using the accounting information. In this article we try to investigate the role of the accounting information in digital transformation in service companies taking into account the empirical findings from a survey of 45 managers of worldwide entities. The findings shows that the accounting information plays a significant role in decision making process in service organizations and the digital technologies such as social media, internet analytics and artificial intelligence have been intensively used in contemporary businesses.

JEL CLASSIFICATION CODES : M40, M41.

Keywords: *Accounting, Management Accounting*

1.Introduction

Today we live due to 4th industrial revolution where artificial intelligence developments taking place include the technological developments. Business model developments where companies with no physical assets are becoming leaders of their markets and organizational design developments.

Brynjolfsson and McAfee (2017) said that during the last years identify a framework of principles and key elements of business strategy that enables leading companies to take advantage of the developments. Furthermore, the technological developments such as Artificial Intelligence (AI) ,Cloud, Big Data and Blockchain has become the fundamentals of the era of industry revolution 4.0 worldwide.

Taking into account PW's global industry 4.0 survey (2016) where the smart robotic process automation change the game. The robotic process automation (RPA) is a feature of intelligent process automation (IPA) that describes logic drives robots executing pre-programming rules on mostly structures data. Moreover, PW's applies key drivers for their change such as a) setting a new strategic direction b) Reducing cost c) change the growth strategy in order to achieve higher quality and technology enabled experience at lower cost, d) change the ability of the workforce in terms of educate them, e) Increasing the legacy processes such as by listening to " the voice of the customer" f) enable to employees to create efficiencies and work smarter.

Warren et al. (2015) stated that Big Data can improved managerial accounting in terms of effective management control and budgeting process, to improve the quality and relevance of accounting information and finally improving the financial reporting in terms of assisting the creation of accounting standards. In addition Vasarhely's et al. (2015) stated that big data interact the traditional source of data and their impact on audit judgment and behavior research.

Mincao et al. (2015) stated that big data improved the efficiency and effectiveness of financial statement audits. Furthermore, Yoon et al. (2015) stated that big data can use as complements audit evidence. The Financial Stability board (2017) stated that the use of artificial intelligent and the machine learning technology changing the view and the results of some financial services such as fraud detection, capital optimalization and portofolio management. In addition Rikhardsson and Yigitbasight (2018) argues that executives adapt technology force in their business in order to support the decision making and control.

Finally, Chandi N (2018) stated that technology like cloud block chain , artificial intelligence, big data will help accountants to reduce manual data ending and improve the quality and the speed of data.

2. Literature Review

Frey and Osborne (2017) find that they expect impacts of future computerization on US labor market outcomes. They estimated that around 47% of total US jobs would be in high risk category in the next decade. Furthermore, Piccarozzi et al. (2018) stated that industry 4.0 in Management Studies after a systematic literature review includes production process efficiency data management relationship with consumers, competitiveness.

Moreover, Milian et al. (2019) after investigation of literature review of fintech articles that the innovate companies in financial industry making a broad use of the high speed communication the extensive use of internet the block chain procedure and the security. In addition, Arundel et al. (2019) stated that the public policy would benefit from innovation techniques and they can collect more data driven research.

The association of accountants and financial professionals in business (2013) stated that there are ten top technologies that would accountants and financial professionals are expected to lead such as:

- a) Mobile access and broadband connectivity
- b) Big data management
- c) Artificial intelligence and robotics
- d) Cyber security from protection
- e) Educational change and developments
- f) Cloud resources
- g) Payments settings and platforms
- h) Virtual and augmented reality were enable people to interact
- i) Digital service delivery
- j) Social interaction using the technological support

Moreover, ICAEW (2018) reported that accounting now use more sophisticated advance technology in order to handle and present quality accounting information. The report shows that artificial intelligence can be very powerful and can be extremely accurate but they can't replace the human capital. The new trend is to collaborate the intelligent systems with human in order to solve all the limitation of the technology.

The artificial intelligence can apply to accounting in terms of a) solving accounting problems b) introduce practical challenge c) improve roles and skills and finally d) raise institutional issues.

In addition, Christaukas and Misicieve (2012) argues that the cloud systems would help small and medium enterprise to get a lot of advantages such as the objective and timely information provide from accounting records. In addition small and medium enterprises would have a) reduced costs of hardware and software b) to offer high levels of data security c) to easily respond to business trends introducing new software d) have easier administration cost e) to have compliance with variety of requirements f) have global access and finally g) many business applies offer free apps in order to test the cloud system

Phillips (2012) stated that cloud system would change accounting forever in terms of improving client financial performance with proactive consulting saving time and reduce cost increasing real time collaborating increasing margins by providing higher value with increased productivity.

Deloitte (2017) article in new machinery of government argues that the Robots can assist in drive to rationalization the public sector estate. The Robots are also known as bots where represented computer code software where replace humans performing rules based tasks.

Baugues (2017) stated that big data would help companies to advocate complex decision in terms of computer algorithm to generate useful solutions.

Kiratsopoulou and Kjellery (2019) stated that there differential opinions and views among big 4 auditing firms regarding the different risks that concerned the digitalization process where there are affect audit risks. In addition, Warren et al. (2015) stated that big data would have increasingly implication for accounting in the near future.

IFAA (2016) reports argues that many companies change their business model in order to adapt more innovate projects for analyzing communicating the big data developments. Moreover, Lansiti and Lackhamani (2017) stated that blockchain technology could reduce the company cost of transactions and if blockchain application would adopt widely could redesign and reshape the world economy.

Smith and Leoni (2019) find practical implication for accountants and auditors when the adoption of block chain technology would be a shift role for these professions. Furthermore, Cacroft (2018) research the use of big data in accounting and finance. After investigating of 47 journals from 2007-2016 identifies six under researched areas as risk and security, data visualization and predict analysis, data management data quality.

In addition, Feng (2015) stated that the development of cloud computing may have a huge impact on company accounting information for the development of small and medium enterprises. Moreover, Byuagchain and Hynchuthn (2020) argues that the enterprises have greater interaction in ERP systems and now they would study to a transaction to a cloud based system.

3. Theory

Before present the findings we must analyze in detail the core theory of digital transformation as follows:

a) Cloud Based Systems

Cloud system help companies to develop and to store great amount of data. This function help manager to make quick decisions in terms of adopting a new model of providing financial information (Christankes and Misevican , 2012)

This internet based technology offer plenty of development such as computing power data storage software application where the customers and companies use computers to achieve economic analysis (ACCA/IMA 2013, Feng 2015).

Phillips (2012) argue that in past accounting and managers communicate with email or travel (face to face) with the clients but now the communication between companies and clients change in great dept..

Furthermore, the accountant now create a function to the internet cloud where can sent information such as bookkeeping , payroll details, consulting service taxes information and contracting the client can send or download information about operation, management job costing. The above function eliminate the time needed between the client and the accountant

in the terms of decreasing the operation. The Enterprise Resource Planning (ERP) where all the accounting information managed can improved by the cloud system because ensure data security , improve account and management data synchronization and finally reduce the risk of unsynchronized accountant and management data and finally the companies can handle a large amount of data without own their data center.

Kind (2020) argue that Oracle ERP cloud invent a digital assistant where can assist the trends and the patterns in financial accounting and management data to make quick decisions. This lead to have a cost reduction of information technology by 60%.

Yoon (2020) stated the many companies established a cloud system where automatically records sales and purchases and collect all the information needed in order to find out any unpaid bill.

This cloud system help companies to improve accounting information. Taxation, payments, receipt management consulting. The companies that applied these cloud systems report a cost work reduction more than 90% . Kim (2020)stated that companies such as Web cash a cloud operating company report an increase by 39% compared to a year before Covid-19.

The companies who apply cloud system improve the effectiveness reduce the operation cost, improve the company intensive with improving company's investing management and maximizes the decision making process.

b) Artificial Intelligence

The artificial intelligence process can derive into two parameters such as machine learning and deep learning. A.I have been used for different field such as medicine finance education tourism autonomous driving, marketing, taxation fraud, military security, tourism etc.

Many countries adopt AI in order to managed and prevent accounting and finance fraud. Yook (2019) stated that AI analyze quicker all the data and using these results can improve the prediction for suspecting irregularities and find the problems before occur. Many researchers argues that the amount and quality of data are the key point in order to establish and introduce a machine learning function.

A.I in addition can help companies in taxation and management accounting. There are companies where establish a software in order to forecast reving AI and identifying hidden risks behind the operations. This establishing use algorithms of machine learning to forecast sales (Yook, 2019) . In addition AI can also use in order to estimate target cost of operations.

Bremman (2001) and Cutler et al (2012) introduce a new method of algorithms called random forecasts algorithms where is a non parametric view to perform learning. The results are to determine the cost of the new products or new service in seconds leading to reduce the calculation time needed using great amount of data. Another area of using AI is the taxation and the implementation of techniques like Manual Robotic Automatation and Robotic Process Automatation with cognitive technologies as Schatsky et al (2016) represents.

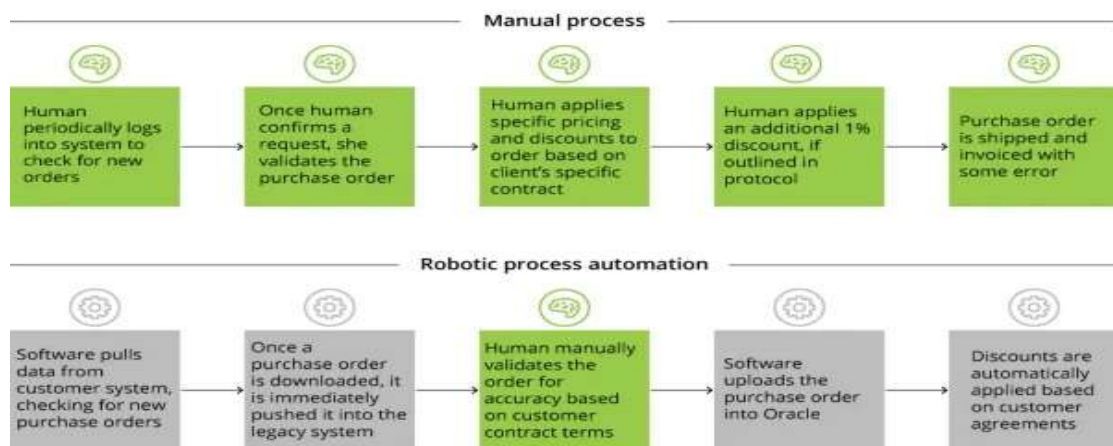
According to Schalts et all (2016) the manual process the human periodically logs into system to check for new orders then once human confirms a request must valid ate the purchase order then the employee applies specific pricing and discounts to order based on clients specific contract the employee applies an additional discount if outlines in protocol , finally the client order is shipped and invoiced in some cases, with errors.

Using the Robotic Process Automation the order starts when software pulls data from customer system and checking for new purchase orders then checking for new purchase orders, then once a purchase order is downloaded it is immediately pushed into purchase system the employee manually validates the order for accuracy based on customer contract terms, then software uploads the purchase order into system and finally discounts are automatically applied based on customer agreements.

Using the Robotic process automation with cognitive technology the software puss data from customer system checking from new purchase order then when a purchase order is downloaded it is immediately pushed into the system then the customer contract is proceed with natural language processing to extract terms and match them with order, finally discounts are automatically applied based on customer agreements.

The below figure shows the different

Figure 1. Manual vs. RPA

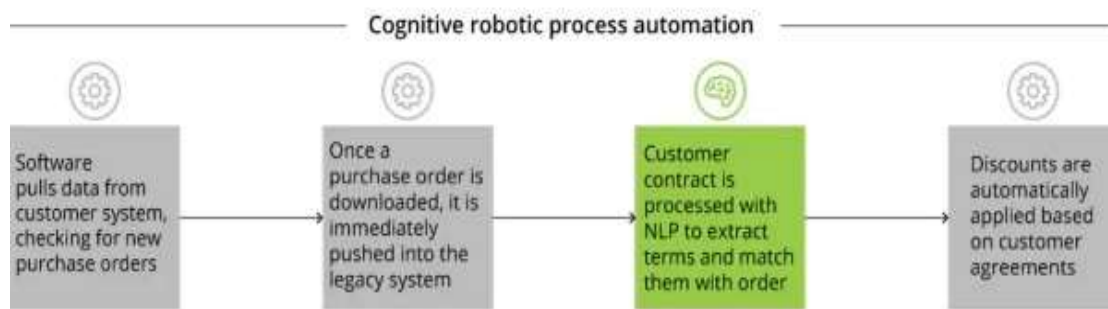


Source: Deloitte analysis.

Graphic: Deloitte University Press | DUPress.com

The use of Robotic Process Automation with cognate technology can increase more the accurate prediction of sales to improved management resources allocation to deflect any system anomaly and make real time track in automate work and finally to help the manager to improved their decision making process and to improve effectiveness and efficiencies (Deloitte, 2017).

Figure 2. RPA with cognitive technology



Source: Deloitte analysis.

Graphic: Deloitte University Press | DUPress.com

c) Big Data

Many countries like Korea established a big data center where analyze data of past tax payment, credit card spending, real estate car purchase , overseas fund information, online market access social media in order to investigate any tax fraud (Yoon , 2020)

PWC (2015) report that big data can improve the quality of the financial accounting information and to improve the control of financial statement . Many local government in Korea used the Big data system in order to manage poor execution bribery and fraud.

Hoogduin eta al. (2014) and Warren et al. (2015) stated that digital information such as audio video , digital images and textual data are big data as an additional source to existing accounting records of financial information.

PWC (2015) shows that the data analysis are suitable for taxation propose and specifically for auditing procedures where the auditing can use more accounting information including accounting and non-accounting data sales in order to compare with pass data.

Big data also provide new procedures in financial and accounting and management decision making. Furthermore. Big data offers new development of data source which includes Google searches, consumer behavior and expectations in collaboration with new information technology innovation can be used to select and collect financial and accounting data more easily.

In addition big data techniques help manager to adopt an accurate decision making taking into account e.g. how investors behave in stock markets. Furthermore, big data system can help all financial and accounting sector to get information about credit risk analysis financial forecasting financial stability assessments and external communication.

In contrast there some concerns about big data analysis and application such as machine learning algorithms because there suitable to explain what is happen rather than why happen.

In addition big data sometimes does not take any hidden sources or raised from privacy laws and this can be an disadvantage where local or relevant authorities or societies refused to give more information (Okiviza Wibison et al 2019)

Tissot (2019) stated that there are four types of big data. First there are web-based indications, second there are financial market data, third there are commercial data and

fourth there are administrative records. Furthermore in order to handle big data must to setup a clear and comprehensive information management process data processing and data validation.

Robinson (2018) stated that the big data has much to offer in different sector of economy (such as banks, enterprises) but it is not a panacea for ever problem judgment will always remain crucial and we need to ensure that the move towards to keep trying to increase more the data –driven models and to explain better the outputs from big data models.

d) Block chain based accounting

Schmits and Leoni (2019) stated that block chain technology based on internet network which uses cryptographs system in order to avoid problems of hacking.

The block chain technology use encrypting in order to prevail from information manipulation and provide solutions to control the ledger of any recorder accounting or financial transaction.

Furthermore, block chain technology can apply in many areas such as to improved financial instruments such as currency, private and public equities, bonds, futures and options derivatives commodities crowd funding, public and private records such as land titles, contracts business ownership criminal records degrees certification grades account records business transaction coupon vouchers software license photos, audio video monies copywriters sim cards and others

Block chain technology is a shared network where anyone can distribute and store various data and transaction in a secure environment where uses encryption to prevent factiousness or manipulation of information block chain technology can apply in many areas or sectors such as trading investment, commodity exchange trading goods and can apply in other areas also such as ownership, identification electronic voters (Lee et. al. 2019). Block chain technology develop in three stages where the first generalization referred with Bit coin operation system the second generation enabled smart contracts and finally the third generation smart contracts are used in different forms of economic political public and society sectors.

The block chain technologies lead to the users to reduce trading and all relating costs to increase efficiency and effectiveness and to prevent from chanting transactions, and to ensure transparenting and reliable accounting and financial information's. In sum the accounting process when combine new technology some of the accounting process is shown below

3.Methodology

In this article we use case study research. According to Yin (2013), the case study method has been and still is, considered as a strong research method. The Case Study method is the most widely used method of scientific research and is applied in many sciences, such as sociology, psychology, economic and political sciences, and so on.

This methodology, which is usually qualitative, is more preferable to other research strategies, when “how” and “why” questions have to be answered, when the researcher has little control over of events and when the focus of the study is on a modern phenomenon (Yin, 2013).

In addition, the case study methodology is appropriate when the research sector is not commonly known and the researcher deals with a 'theory building' (Eisenhardt, 1989). Ghauri (2004) argues that the case study is a flexible research approach that is suitable for a range of

different types of research questions. Several researchers have provided various definitions for the Case Study method.

Woodside and Wilson (2003) provided a broader definition than that of Yin, i.e. the case study is a research focusing on description, understanding, predicting and / or controlling the subject (e.g. process, animal, individual, household, organism, group, industry, culture or nationality).

Finally, according to Eisenhardt (1989), the case study is defined as a research strategy that focuses on understanding the dynamics presented in individual environments.

The purpose of this article is to focus on companies that are based on services which digital transformation has not been paying attention.

To explore these businesses which rely on services we will need to approach the process with case study method (Yin, 2013) by answering the research's questions such as understanding the accounting practice for the digital transformation in Show Caves. The case study is occupied with concerns the investigation of 45 companies that operate as show caves enterprises. In addition, the study was based on questionnaires and archives research. The main advantage of this method is that questing people, who are responsible for taking decisions, compiled by priority and followed by directors and executive officers.

The main question asked was what role play the digital transformation on their company and what changes have been done in order to develop a digital transformation environment for adapting quick accounting information. In contrast, there are disadvantages during this research. There are no similar studies for the digital transformation and accounting information in Show Caves. Even should overcome the bias in the reporting of accounting data, the adoption of digital transformation the underestimation of accounting information.

Although these disadvantages faced by requiring financial statements which are used in order to cross-check and with questions that are repeated in a different order. We even tried to investigate the separation of digital transformation costs by carefully studying accounting data and constantly putting questions to business managers.

4. Research Analysis

In order to analyze the research we conduct 45 questionnaires of 45 ISCA members companies and specifically General and senior managers. The research last for three months from January-March 2021. We use a five point Likert scale (1: very strongly disagree to 5 were is strongly agree) all the findings(measurement) were scored. We choose the Likert scale because is widely used in worldwide social work research, and is commonly constructed with one to five points and it is offend treated as an interval scale method.

In order to investigate we conduct a hypothesis test as follows:

The hypothesis (h1) is about if skills in digital transformation is positively related to the intention to adopt from companies the digital transformation procedures.

The hypothesis (h2) consider if the state regulatory environment is positively related to the intention from enterprises to adopt digital transformation.

The hypothesis (h3) related if the enterprise organization culture is positively related to the intention to adopt digital transformation.

The hypothesis (h4) is related about customization and if related negatively.

The hypothesis (h5) is about if data security is negatively related to the intention from enterprise to adopt digital transformation.

Table 1.

Variable	Definition
Digital Skill	The degree to which the skill level of employees utilizing IT technologies, such as computer, network, and software
Regulatory Environment	The degree to which less stringent regulatory environment
Organizational Culture	The degree to which level of an organization is responsive and flexible
Data Security	The degree to which poor data protection practices adopted and unauthorized data access occurred
Customization	The degree to which the level of customization limitation

Table 2: Regression Analysis Results

Variable	AVG	SD	1	2	3	4
Digital Skill	2.185	1.145				
Regulatory Environment	1.845	0.919	0.205			
Organizational Culture	3.915	0.845	0.779	0.281		
Customization	2.585	0.956	0.046	0.035	0.087	
Data Security	3.550	0.898	0.099	-0.010	0.158	0.289

Table 3: Hypothesis Testing Results

Variable	Beta	s.e	T-value	t-value	Sig.	HYPOTHESIS TESTING
Constant		0.256	-1.389	-1.122	0.235	
Digital Skills	0.152	0.089	0.777	0.575	0.308	H1 -NOT SUPPORTED
Regulatory Environment	0.155	0.102	2.282	2.582	0.124	H2- SUPPORTED
Organizational Culture	0.852	0.187	4.356	3.465	0.002	H3- SUPPORTED
Customization	-0.015	0.089	-0.057	-0.120	0.856	H4- NOT SUPPORTED
Data Security	-0.040	0.080	-0.754	-0.565	0.356	H5-NOT SUPPORTED

Taking into account the regression results from tables 1.2.3 we can conclude that hypothesis (h1) is not supported because the research shows that the digital skills is not positively relates to the intention to adopt from companies the digital transformation procedures. In contrast the hypothesis (h2) is supported because the results shows that the regulatory environmental

related positively from the enterprises to adopt digital transformation. That's mean that the companies follow the state regulatory proposal in order to transform their services.

Furthermore, the hypothesis (h3) is supported and related to the enterprise culture where is positively related to digital transformation. That's mean that the board of directors and the council members introduce a digital transformation culture in order to increase their sales.

The hypothesis (h4) is not supported because customization for digital transformation don't allow the companies to introduce new procedures.

The hypothesis (h5) is not supported because the general managers believe that data security would be a top decision in order to adopt the digital transformation in their companies.

Take into account the econometric regression model we found that there are not correlation between the independent variable and the dependent variable (0.798). The R-squared value was found to be 0.589, which means that independent variables account for 58.9% of the dependent variable. Specifically we found that the digital transformation adoption intention. The adjusted R-squared found to have a value of 0.674.

In addition Durbin–Watson test has a value of 2.145. Because is not close to 0 or 4, there is no correlation between the residuals, that mean that it can be interpreted that the regression model is suitable for further analysis.

The F-value was 29.558 and the probability of significance was 0.001 ($p < 0.05$), the regression line was found to fit the regression econometric model.

5. Discussion and Conclusion

In this article we try to investigate the relation between the accounting information and the digital transformation in service organizations taking into account 45 show caves enterprises. We found that there are lack of knowledge between the senior management in terms of digital skills (IT technologies, computer, network and software).

The findings showed that the regulatory environment help the enterprises to adopt more easily the digital transformation in terms of subsidies the funds needed for buying technology items. Another interesting finding was the organization culture where we found positively related to the adoption of digital transformation.

Moreover, enterprises where established an IT environment were more flexible to adopt the digital transformation easily. In contrast Data security were negatively related with the adoption of digital transformation because the manager believe that the adoption of new technology would be dangerous for the security of their data especially using the cloud ERP systems. In addition the customization in terms to which the level of customization limitation is negatively related with the adoption of digital transformation.

Finally this article provides implications for enterprises seeking to introduce Digital Transformation under the COVID-19 environment.

In addition show caves enterprises increased interest in Digital Transformation using the accounting information because of COVID-19. In contrast, if the culture of the organization push the technological changes, thus the employees would follow these changes and the enterprise would succeed as a whole in terms of digital transformation.

Finally, there is one limitation of this article. The results of this research were analyzed by questionnaires might be limited only to show caves.

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