

# THE CONTRIBUTION OF MANAGEMENT INFORMATION SYSTEM ON INNOVATIVE PERFORMANCE: THE CASE OF JDI COMPANY

Harvey T. Ong, De La Salle University Manila

## ABSTRACT

*Management Information Systems (MIS) is the usage of information systems at the operational, tactical, and strategic levels so that businesses are aided in the achievement of goals (Oprea, 2007). Innovation is almost always inherently present in MIS due to MIS' specialization from company to company, this study will simply show the extent and effect of particular types of innovations for JDI Company's MIS. The researcher conducted the study by identifying the innovative performance contributed by the use of MIS. The researcher measured the extent at which the following types of innovation were adopted by the firms: organizational innovation, marketing innovation, process innovation, product innovation, behavioral innovation, risk innovation. The survey results shows that most all of the mean averages for the 6 types of innovation yielded above average results (>3), that the majority of the types of innovation for JDI Company have a higher mean average for the internal respondents than the external respondents, which may imply that the staff may be overestimating their own innovativeness as it is not as evident to their customers. The results of the study also showed that in the home garden industry even companies like JDI Company have tried using MIS and has seen good results, and it has contributions to different types of innovations. Investing in the MIS has also improved the management of financial resources in the companies as it is easier for them to make decisions with the system. It also save time and has also reduced discrepancies and mistakes caused by human error.*

**Keywords:** Management Information System, Innovation, Organizational Innovation, Marketing Innovation, Process Innovation, Product Innovation, Behavioral Innovation, Strategic Innovation

## INTRODUCTION

### Background of the Study

One of the most important things needed to keep up with the fierce competition in business is efficiency. In the current age where technology is rapidly evolving, the use of technology to manage information is becoming more popular. This technological revolution gave rise to Information Systems (IS), which are designed to reduce human error and improve efficiency with the aid of technology. There are several factors that contributed to the popularity of IS, foremost of which is the cheap access to educated human resources. These factors, however, cannot be the only reason why countries in Asia like the People's Republic of China, India, Malaysia, and the Philippines, are progressing faster than most of the other areas. There are countries with similar situations as these fast growing nations, and it can be said that there is no one method that can work for every country since each one should develop their own approach that is relevant to their needs. Management Information Systems (MIS) is defined by Oprea (2007) as the usage of information systems at every level, may it be in operational, tactical, or strategic decisions, to help businesses achieve their goals and objectives. Hence, MIS is a system that collects and processes data and provides it to managers at all levels for decision-making, planning and implementation (Michalek, 2006). However, Dehning, Dow & Stratopoulos (2004) cast doubts regarding the credibility of information systems as there was an era, known as the productivity paradox era, where it was observed that there were no links

between financial performance and the usage of IS. This led to several organizations to temporarily veer away from using such technology as they deemed it to be ineffective and wasteful.

### **Rationale of the Study**

Research by Tan & Peng (2003), among others, mentioned that there is a significant relationship between information technology and organizational efficiency and performance. Management information system contributes to the effectiveness and efficiency of organizations by providing relevant information for sound decision-making and by providing assistance in making necessary changes in the organizational plans and procedures. This is supported by the study of Adonie, Russo & Dean (2007) that relevant information through the use of MIS can provide recommendation to enhance products and allows the organizations to gain competitive advantage in this fast changing environment. The effects of MIS can be seen from the perspective of customer service, financial and operations management of firms. De Queiroz & Olveria (2014) also support this, stating that companies such as clothing retail businesses are searching for such technology that gives them more flexibility and smoothen operations, as well as give them competitive advantage over their current competitors and soon-to-be competitors. These improvements from MIS typically come in form of innovations.

### **Statement of the Problem**

“What is the contribution of Management Information System (MIS) to JDI Company's innovation?”

### **Objectives of the Study**

The main objective of this research was to determine the contribution of Management Information System (MIS)'s to JDI Company's innovation.

### **Significance of the Study**

The study offered significant information with regards to how Management Information Systems (MIS) affected organizational innovation leading to strategic planning. The results of the study revealed important information for the benefit of following entities:

#### **Academic Community**

This research paper will benefit faculty teaching computer subjects, and the students taking up MIS courses and subjects. The faculty can share the information of this research papers to their students, and they would also have idea on what specific topics need to be discuss in class lecture. On the other hand, students would be able to apply it in the real business application when they graduate.

#### **Different Corporations in Metro Manila, Philippines**

To give them feedback on how other companies use the Management Information System (MIS) for their daily business transactions. They can also benchmark the best practices from companies that are using Management Information System. The companies can also have idea on how to further improve in the utilization of their Management Information System which can help them streamlined their processes and enhanced their decision making processes when working in group.

## Scope and Limitation

The uses of Management Information System (MIS) focused on this study were limited to JDI Company only. One MIS was used for the basis of this study. This study is only limited in the Philippines due to obvious logistical and cost constraints. Other strengths and weaknesses found were not used as indicators of organizational innovation. Some information requested from the company was deemed too confidential and were not disclosed by the key informant; these included financial records, specific names of their MIS and their developers, and a variety of sensitive company documents.

Originality value of this study opens up the black box on the MIS linkages to innovative performance and contributes to the literature and body of knowledge by extending the theoretical lenses while suggesting insightful and practical implications. And one of the most important things needed to keep up with the fierce competition in business is efficiency. In the current age where technology is rapidly evolving, the use of technology to manage information is becoming more popular. This technological revolution gave rise to information systems (IS), which are designed to reduce human error and improve efficiency with the aid of technology.

## LITERATURE REVIEW

Ilmudden states that “Though prior studies have attempted to explore the various effects of managing information technology (IT) investment on firm performance, the mechanism through which management of IT impact on firm performance rests less clear. Drawing on the resource-based theory and process theory, this study examines how managing IT impacts business-IT alignment and firm performance. The primary survey of 182 responses from IT and business managers from Sri Lanka were empirically examined. Findings The findings reveal that managing IT has a positive and strong impact on business-IT alignment and firm performance. Further, business-IT alignment partially mediates between managing IT investment and firm performance relationships. Today, businesses have invested a massive amount of money in IT investment, and the return on this investment is always a serious concern for managers and industry practitioners. This study finding proposes meaningful insights on managing IT, business-IT alignment and firm performance.”

According to the study of Tajpour, the purpose of study is to investigate the effect of entrepreneurial intention on performance development mediated by social media in digital start-ups. The study population includes the managers of 416 digital start-ups. Based on Cochran's formula and with an error level of 5% at 95% confidence level, the minimum number of samples for this study was estimated to be 199. To collect data, a standard 29-item questionnaire was distributed online in 2020. This research has investigated the relationships between variables by using PLS3 software and structural equation modelling. The results indicate that the components of entrepreneurial intention including knowledge sharing, reputation, social relations and identity have a positive effect on the performance of digital start-ups mediated by social media. Furthermore, the results show that successful companies are constantly creating and distributing new knowledge and rapidly applying it to new technologies and products.

Ziyae states that “urban entrepreneurship is considered one of the vital strategies that directed cities toward self-control by reducing the unemployment rate and its arising problems, creating sustainable revenue and preparing the ground for citizens' independence. The study explains how particular women solve workplace-specific poverty and foster urban wealth by developing start-ups, new businesses or ventures. The current research uses a qualitative method and uses the grounded theory approach. Data were collected by selecting 24 outstanding women entrepreneurs using snowball sampling and semi-structured interviews in Tehran Metropolitan. The results of the study reveal that the main aspects of the model of urban entrepreneurship consist of causal factors, intervening factors and contextual conditions. By shaping the policies

and organizing educational plans, training courses and empowering of women, as well as the establishment of supportive units for the development, identification of the opportunities, developing protective rules, the factors as mentioned above lead to cultural, social and economic development, tendency toward entrepreneurship and development of entrepreneurship among women.”

According to Kozakov, since the beginning of 2008-2009, the paradigm of sustainability of public administration has been increasingly investigated in order to study competitive models, values, anti-crisis management in the sphere of politics. The principles of New Public Management are complemented by a paradigm of adaptation and flexibility in order to ensure the sustainability of the public administration system. The new concept of public administration is interdisciplinary in nature; it integrates approaches to management borrowed from the theory of organization, anti-crisis management, Joined-up Government and Network Governance, New Public Management, Digital Government and Administration. The existing conceptual model of adaptation of the public administration system to global risks provides the integration of Resilience and adaptation paradigm in public administration. However, the philosophy of public administration in different countries proves the existence of obstacles to adaptation opportunities due to poor interagency links at different levels of government, low responsibility and accountability. The results of the present research can be used as a paradigm in public crisis management in the context of global risks and challenges.

In terms of originality and value, the proponent’s study undertakes a first of its kind conceptual analysis at the level of how contribution of MIS on innovative performance of a firm. The utilization or adoption of MIS and relate it to innovative performance still a theoretical gap and lack of research; hence, the current study tries to shed light on the topic and fill this gap in the body of knowledge.

## **THEORETICAL FRAMEWORK**

### **Types of Management Information Systems (MIS)**

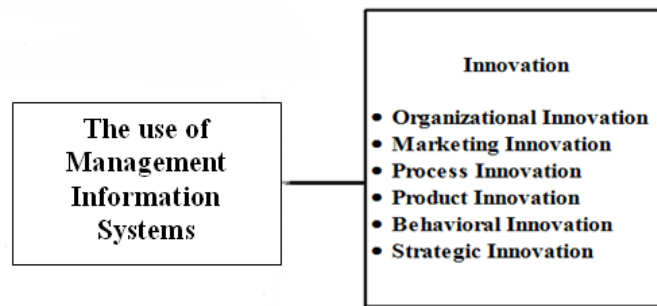
The four categories of management information systems are based on the level of support that the information system provides in the process of decision making.

Databank Information System is responsible in observing, classifying and storing any data item that can potentially be useful to the decision maker. The information from the databank system is only suggestive and it is best for unstructured decisions.

The Predictive Information System provides data and information as well as predictions and inferences. This system assists decision makers in answering “what if” questions and it verifies if the underlying assumptions are true. Hence, this type of MIS is catered towards semi-structured decisions.

The Decision-making Information System gives professional or expert recommendations to managers in the form of a single recommended course of action or a list of possible courses of action, all of which are according to the value system of the organization. A decision-maker only has to approve, deny or modify the recommendation, hence, making decision-making faster yet still accurate. The decision-making information system is more suitable for structured decisions. Lastly, the Decision-Taking Information System is where the information and the decision maker are the same. It has both the abilities of the predictive information system and the decision-making information system. It is when the system is completely accurate that it creates decisions without actual managerial interference.

### **Operational Framework**



**FIGURE 1**  
**OPERATIONAL FRAMEWORK**

The framework presented above shows us that using MIS is already conduit to generating innovation. This is because MIS are often specialized for a company's need and the more specialization in a task, the more innovation is generated and required.

### Operational Definition of Terms

- Hardware – these are the physical components of the computer that enables it to run a mix of programs and processes called software
- Human Resources – a group of people who make up an organization's workforce
- Innovation – an idea and actualization of future needs or wants
- Management Information System (MIS) – computer based system that provides upper management tools to evaluate and make decisions
- Strategic Planning – systematic process of envisioning future and translating this vision into desired goals or objectives
- Strength – an advantage or benefit of an organization
- Technological innovation- development of different innovations that create improvement on technology
- Utilization – to make an effective use of something
- Weakness – a disadvantage of an organization that needs to be improved

## RESEARCH METHODOLOGY

### Company Background

JDI Company is a wholesale distributor of agricultural and applied construction chemicals. The vision of the company is to be the marketing and distribution company of choice in the market in which they operate. The company also represents a number of leading global and local crop protection and applied construction materials companies, each with world class quality products and technical support. The key focus of the company's operations is the safe and proper use of products, with due consideration for environmental protection and this forms part of their regular training program. The stewardship programs and the extension services offered to the customers consistently reflect their principles. The product distribution is done through a wide network of authorized distributors and dealers nationwide, and market coverage is achieved highly trained sales force and technical support team. Products are distributed through the company's distribution network by accredited truckers and forwarders whose staff is annually trained in the safe and proper handling of chemicals. Operations and Sales & Distribution staff are regularly trained basic safety and first aid procedures, with special emphasis on safe handling and use of chemicals

## Research Design

This mixed-method study used the single-embedded case study design in gathering as well as analysing data. Methods to gather both quantitative and qualitative data included surveys, participation-observation and fieldwork. The survey was used in the study as it can gather data from a large population in a relatively convenient and efficient manner. Surveys are systematic, self-monitoring and representative as it is often used in research studies (Burton, 2007). Survey as a methodology studies the sampling of individual units from a population and constructs questionnaires as a form of quantitative data collection. Furthermore, survey forms were also deployed to assess the management information system (MIS) contributions in an organization. The researcher chose to do field work for this study since it is often used to monitor human behaviours in natural conditions of their daily life (Basinska, 2012). Hence, the researcher is closer to the real world and thus gains from immediate contact with the respondents. It is one of the best ways to discover the particular information required and to answer research problems.

Basinska (2012) emphasized the importance of fieldwork especially in data gathering in company as it allows the researcher to interact, understand the people in the company, and see problems that cannot be extracted from interviews. Through the use of the data from the surveys and interviews, the proponent used descriptive analysis method of analysis for this study. Descriptive analysis is the summarization of the data retrieved from the respondents and presenting them in an easy to understand manner; this includes the mean, and mode. For the case of this study, however, the researcher decided not to include median as it is not relevant to the investigation.

## Sampling Plan

JDI has been screened to make sure that they have been using Management Information Systems (MIS) for at least three (3) years to account for the lag effect in innovation. The chosen company was given survey to be answered by both internal and external users to determine the effect MIS has on employees and their customers. Furthermore, as this study used a mixed method approach, the researcher also conducted interviews with all the departments involved in using the chosen companies' MIS, as well as the finance and Information Technology (IT) departments to obtain the needed information outside of the surveys. The internal respondents refer to the employees that use the MIS and the external users refer to the long term (5-10 years) clients of the companies.

## Data Gathering Procedure

The researcher used self-administered questionnaires in gathering data from both the staff and customers of JDI Company. Afterwards, in-depth interviews were conducted with the IT heads of the company so that their insights can be gathered. Both quantitative and qualitative data were collected, total of 45 internal customers from the respondent companies were invited to answer the survey on the utilization of MIS and 6 innovation models pertaining to organizational, marketing, process, product, behavioral, and strategic concerns. Meanwhile, a total of 27 external customers were surveyed on the 6 innovation types.

## Method of Data Analysis

According to Creswell (2009), there are different approaches in a mixed method data analysis. In concurrent strategies, data can be transformed to either quantifying qualitative data or qualifying quantitative data. Quantifying qualitative data involves creating codes and themes and counting the number of times they occur in the text data which enables a researcher to

compare results with the data. Another approach is to examine multiple levels. In a concurrent embedded model, surveys were conducted at one level to gather quantitative results about a sample, and interviews were done at the same time to be able to explore the phenomenon with specific individuals. Such analysis was chosen by the proponent in the study, because it would simply show the results of the contribution of MIS on 6 types of innovative performance. Since the study is also descriptive in nature, it would show the quantitative results of frequency count and percentage distribution by the response of the survey respondents.

For the innovation summary, the following Mean and Mode Response Interpretation will be used : 5.00-4.20 means “Strongly Agree”, 4.19-3.40 means “Agree”, 3.39-2.60 means “Neither Agree nor Disagree”, 2.59-1.80 means “Disagree” and 1.79-1.00 means “Strongly Disagree”

## RESEARCH FINDINGS

### Demographic Profile

	<b>Freq count</b>	<b>% share</b>	<b>Freq count</b>	<b>% share</b>
<b>Location</b>				
Warehouse	12	26.67%	N/A	N/A
Office	33	73.33%	N/A	N/A
<b>Age</b>				
18-25	4	8.89%	0	0%
26-30	10	22.22%	5	22.73%
31-35	12	26.67%	6	27.27%
36-40	10	22.22%	5	22.73%
41-45	3	6.67%	6	27.27%
46-50	3	6.67%	0	0%
51-55	2	4.44%	0	0%
56-60	1	2.22%	0	0%
<b>Gender</b>				
Male	35	77.78%	20	90.91%
Female	10	22.22%	2	9.09%
	<b>Name</b>		<b>Rank</b>	
IT Representative	Ms. Dizon		IT Manager	

To reiterate, the following are the definitions of the 6 types of innovations to be used in the study. Organizational Innovation is the application of new methods in the organization’s business practices. Marketing innovation is the implementation of new marketing methods involving changes in product or packaging design, promoting the product and/or pricing. Process innovation is the execution of new ways to produce or deliver the intended output. A product innovation is the launching of an improved or completely new product, which focuses on “technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics” (Gunday, 2011). Behavioural innovativeness is the sustained change in people’s behaviour towards innovation after being introduced to an external factor, usually this may be due to support from top management regarding the employees having an innovative mind-set. Strategic innovation is the development of new strategies that create a

certain competitive advantage for the firm against the current market (Wang & Ahmed, 2004) (Table 2).

<b>Innovation</b>	<b>Respondents</b>	<b>Jardine Distributions Inc.</b>
Organizational	Internal	Mean: 3.7
		Mode: 4
	External	Mean: 4.13
		Mode: 4
Marketing	Internal	Mean: 4.23
		Mode: 4
	External	Mean: 4.04
		Mode: 4
Process	Internal	Mean: 4.09
		Mode: 4
	External	Mean: 3.99
		Mode: 4
Product	Internal	Mean: 4.12
		Mode: 4
	External	Mean: 3.98
		Mode: 3
Behavioral	Internal	Mean: 4.21
		Mode: 4
	External	Mean: 4.14
		Mode: 4
Strategic	Internal	Mean: 4.25
		Mode: 4
	External	Mean: 4.06
		Mode: 4

### **Organizational Innovation**

For JDI Company, the mean score for the questions under organizational innovation shows a score of 3.59 and a mode of 4. All the questions, except for number 5 had a mean score of a neutral response but are leaning towards agree. Which means that the users somewhat agree that the company renews its routines, procedures and processes to execute firm activities in innovative manner, The company renews the supply chain management system, the company renews the production and quality management systems, the company renews the human resources management system, the company renews the organization structure to facilitate teamwork, the company renews the organization structure to facilitate coordination between different functions such as marketing and manufacturing, the company renews the organization structure to facilitate project type organization and that the company renews the organizational structure to facilitate strategic partnerships and long- term business collaborations. On the other hand, question 5 had a mean score response of agree. Which means that the users agree that the company renews the in-firm management information system and information sharing practice?



## Marketing Innovation

For JDI Company, the mean score for the questions under marketing innovation shows a score of 3.68 and a mode of 4. All the questions except for number 11 had a mean score of and agree response. Which means users agree that the company renews the design of the current and/or new products through changes such as in appearance, packaging, shape and volume without changing their basic technical and functional features, the company renews the product promotion techniques employed for the promotion of the current and/or new products, the company renews the product pricing techniques employed for the pricing of the current and/or new products and that the company renews general marketing management activities. On the other hand, question 11 had a neutral mean score which means that the users feel neutral when asked if the company renews the distribution channels without changing the logistics processes related to the delivery of the product.

The mean and the mode of the organizational and marketing innovation are almost similar, showing that the respondents agree that these types of innovation are present in their company. The respondents agree that the company is executing innovative ways of attracting its customers, renews its quality management and the organization structure to coordinate with its customers, and creates new business practices that will enhance their business relationship with the company. Moreover, the respondents agree that they renew their pricing, product, promotion to give best outcomes to their customers.

## Process Innovation

The mean score of the questions under process innovation shows a score of 4.086 and a mode of 4. All the questions had a mean score of an agree response. Which means that the users all agreed that the company determines and eliminates non-value adding activities in production processes, the company decreases variable cost components in manufacturing processes, techniques, machinery and software, the company increases output quality in manufacturing processes, techniques, machinery and software, the company determines and eliminates non-value adding activities in delivery related processes and that the company decreases variable cost and/or increases delivery speed in delivery related logistics processes.

The process and the products innovation also show the similar mean which is 3.99 and 3.98. The mode of the process innovation is 4 and the product innovation's mode is 3. The respondents agree that process innovation is present in the company. The respondents agree that the company determines and eliminates non-value adding activities and they decrease the variable cost components and increases the output quality in their manufacturing process, techniques, machinery and software.

## Product Innovation

The mean score of the questions under product innovation shows a score of 3.66 and a mode of 4. All the questions except for number 21 had a mean score response of agree. Which means that the users agreed that the company increases manufacturing quality in components and materials of current products, the company develops newness for current products leading to improved ease of use for customers and to improved customer satisfaction, the company develops new products with technical specifications and functionalities totally differing from the current ones and the company develops new products with components and materials totally differing from the current ones. On the other hand, question 21 had a mean score of 3.65 which falls under neutral. Which means that the users feel neutral when asked if the company decreases manufacturing cost in components and materials of current products?

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the company determines and eliminates non-value adding activities and they decrease the variable cost components and increase the output quality in their manufacturing process, techniques, machinery and software.

### **Behavioral Innovation**

The mean score of the questions under behavioral innovation shows a score of 3.5 and a mode of 4. Questions 25, 27 and 28 had a mean score of an agree response which means that the users agreed that they get a lot of support from managers when they try new ways of doing things, they are willing to try new ways of doing things and seek unusual, novel solutions and that everyone is encouraged to think and behave in original and novel ways. While questions 26 and 29 had a mean score response of neutral but are both leaning towards agree. Which means that the users somewhat agree that in the company, they tolerate individuals who do things in a different way and that their behaviour depends on what the company wants them to.

The behavioral and strategic innovation have also similar mean and has the same mode. Thus, the respondents agree that the company encourages its employees to be more autonomous in making decisions, the company harbors employees that think creatively and think of innovative ways in solving problems, the company allows the employees to do things uniquely and are free to make their own decisions. Furthermore, the respondents also agree that R and D are present in the company and that they are utilizing new resources.

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### **Strategic Innovation**

The mean score of the questions under strategic innovation shows a score of 3.75 and a mode of 4. All the questions had a mean score response of agree except for question number 33 which means that the users agreed that the firm's R&D or product development resources are adequate to handle the development needs of new products and services, the key executives of the company are willing to take risks to seize and explore "chancy" growth opportunities, senior executives constantly seek unusual, novel solutions to problems *via* the use of "idea men" or someone who provides original ideas and that they prioritize new way of doing things rather than using old ways. On the other hand, question 33 had a mean score response of neutral but is leaning towards agree. Which means that the users somewhat agree that when the company sees new ways of doing things, they are first at adopting them.

## **CONCLUSION**

While most all of the mean averages for the 6 types of innovation yielded above average results (>3), it can be observed from the Table 2 - Innovation summary that the majority of the types of innovation for JDI Company have a higher mean average for the internal respondents than the external respondents, which may imply that the staff may be overestimating their own innovativeness as it is not as evident to their customers.

Innovation has always been one of the main targets of businesses worldwide as it provides strong competitive advantage against their rivals. As seen in the review of related literature, there are a number of studies which show that organizational slack leads to innovation. Slack has often been viewed in a negative light but this study has revealed that its subsequent effect can actually depend on the organization. For every type of business, there appears to be an optimal MIS model that is being adopted by each one of them. One has to

always consider the type of industry, company size and financial capabilities. To date, many business establishments do not use MIS and this is particularly true for micro and small enterprises. However, in the home garden industry even companies like JDI Company have tried using MIS and has seen good results.

Based on the information gathered from interviews, it can be concluded that they have the appropriate organizational capability to run the MIS. In terms of employees, no user is allowed to operate the system unless they have received proper training and have exhibited their aptitude in using the system. The MIS is also widely received in each organization because of how it eases their workload. Feedback from the users is also taken into consideration every time an update or upgrade would be scheduled.

Despite the heavy initial investment needed for the MIS, the companies are still able to maintain, manage, and operate the system. Investing in the MIS has also improved the management of financial resources in the companies as it is easier for them to make decisions with the system. The Management Information System managed to bring about improvements on the business processes of all the companies in terms of customer satisfaction, operational management and financial investment. The MIS also increased the motivation of the employees as it reduced the burden of the workload. The customers are satisfied with the use of the information system.

The Management Information System is able to deliver maximum productivity since it produced timely and accurate data. The information stored can easily be accessed and it has a friendly interface. Thus, the users experienced minimal difficulty in using the information system. The users only encountered minimal problems while using the system. Although training was a part of executing and using the system, the users had the appropriate skills in using the system and the training was said to be useful. Moreover, the employees were able to organize their work with the use of the system.

Relating to the aforementioned, the MIS has also significantly reduced paper trail from each company. It also made the companies become transparent internally because all transactions are recorded, which means it can be reviewed by management any time they wish. Their previous systems were not automated, so when looking for necessary documents, the employees had to the storage room to manually find the necessary documents. It took time away from their intended productive hours. Now, they save time because most information is just a click away; this has also reduced discrepancies and mistakes caused by human error.

With growing companies such as the ones under study, data input is constantly increasing. The MIS would need more processing power, and this entails additional investments in hardware and software. As long as the company has enough financial resources to maintain and operate the MIS, this will not be a problem.

After scouring through various literatures and assessing the results of both surveys and interviews, the researcher summarized the business practices that organizations in the home and garden industry should try to follow in order to maximize their levels of innovation. The managers should have an active role in monitoring the system, organizations should integrate their company policies into their processes to reduce policy, they should keep their hardware and software updated, and they should ensure that their system is always up-to-date. While it isn't necessary to always match their software and hardware together, it would be better for them to purchase software and hardware with an eye on the future so that any updates or changes to the system would still be compatible to the one they have.

## RECOMMENDATIONS

### For JDI Company

To maximize innovation for JDI, they should cut back on excessive spending (equipment) and make use of their spare resources (reserve funds) all types of innovation will

improve. The company is heavily dependent on the system itself as well as the internet connection; should one of them experience any technical difficulties, all processes will immediately slow down. As such, it might be better to prepare alternative courses of action should such situations arise. The company should also consider backing up the data from the server regularly as all of the systems are connected to the main server and they already experienced technical problems before. By using a back-up system, it will help the company prepare for similar situations that may arise.

## Academe

There have been several studies arguing the influence of MIS, and whether it has contribution to innovation or not. Additionally, there is scant literature in the Philippine setting regarding these topics. But after the gathering and analysing of data for survey and interviews, there have been new data and information that has come to light. This might further enrich the literature already established regarding MIS and innovation models. It is recommended that the academe further pursue studies along these topics.

## Future Researchers

Future researchers must take into consideration the size of the company they are studying. Big companies will have little to no time to entertain such extensive scholarly undertakings. Future researchers must be patient with respondents and key informants since answering interviews and surveys will interrupt with their work. It is also encouraged that future researchers do their best to improve the survey questionnaires as it was deemed too long by many respondents under the study.

## REFERENCES

- Bae, H., & Rhee, J. (2014). Organizational slack and technological innovation: The moderating effect of environmental uncertainty. *Asian journal of technology information*.
- Basinska, A. (2012). Higher school of humanities and journalism. Retrieved from <http://www.crest.fr/congres-afs/basinska.pdf>.
- Burton. (2007). Survey research: Choice of instrument, sample. Bloomberg: School of public health. Retrieved from [http://ocw.jhsph.edu/courses/hsre/pdfs/hsre\\_lect11\\_burton.pdf](http://ocw.jhsph.edu/courses/hsre/pdfs/hsre_lect11_burton.pdf)
- Creswell, J.W. (2009). *Research design: Qualitative, quantitative and mixed method approaches*. California: SAGE Publications, Inc.
- Dehning, B., Dow, K.E., & Stratopoulos, T. (2004). Information technology and organizational slack. *International journal of accounting information systems*, 5(1), 51-63.
- Geiger, S.W., & Cashen, L.H. (2002). A multidimensional examination of slack and its impact on innovation. *Journal of managerial issues*, 14(1), 68-84.
- Gunday, G., Ulusoy, G., Kilic, K., & Alpkan, L. (2011). Effects of innovation types on firm performance. *International journal of production economics*, 133(2011), 662-676.
- Heng, L., Ding X., Guo H., & Luo J. (2014). How does slack affect product innovation in high-tech Chinese firms: The contingent value of entrepreneurial orientation. *Asia pacific journal of management*, 31(1), 47-68.
- Illmuden, A. (2021). The impact of managing IT on business-IT alignment and form performance: An Empirical Study.
- Kozakov, V., Kovalenko, N., Golub, V., Kozyrieva, N., Shchur, N. & Shoiko, V. (2021). Adaptation of the Public Administration System to Global Risks. *Journal of Management Information and Decision Sciences*, 24(2), 1-8.
- Michalek, D. (2006). Benefits of management information systems and important conditions for successful implementation and running. *Journal of information systems and operation management*, 1-8.
- Najmaei, A. (2014). Towards an integrative model for management of organization's total innovation: Insights from the strategic-process view. *IUP journal of knowledge management*, 12(3), 61-73.
- Oprea, M. (2007). With emphasis on the integration of three technologies. *International Journal of Computers, Communications & Control*, 2(1).
- Plessis, M. (2007). The role of knowledge management in innovation. *Journal of knowledge management*, 11(4), 20-29.

- Rainier, R.K., & Turban, E. (2009). *Introduction to information system: Enabling and transforming business*. John Wiley and Sons, Inc.
- Tan, J., & Peng, M.W. (2003). Organizational slack and firm performance during economic transitions: Two studies from an emerging economy. *Strategic Management Journal*, 24(13), 1249.
- Wang, C., & Ahmed, P. (2004). The development and validation of the organisational innovativeness construct using confirmatory factor analysis. *European journal of innovation management*, 7(4), 303-313.
- Wonglimpiyarat, J. (2004). The use of strategies in managing technological innovation. *European journal of innovation management*, 7(3), 229-250.
- Zinn, J., & Flood, A.B. (n.d). Slack resources in health care organizations: Fat to be trimmed or muscle to be exercised? *Health services research*, 44(3), 812-820.
- Ziyae, B., Sadeghi, H., Shahamat Nejad, M. & Tajpour, M. (2021). A Framework of Urban Entrepreneurship for Women Breadwinners, *Foresight journal*, Ahead of print. Retrieved from <https://doi.org/10.1108/FS-12-2020-013>.