

USING WORK-CENTERED ANALYSIS (WCA) FRAMEWORK TO ANALYZE MANAGEMENT INFORMATION SYSTEM (MIS): THE CASE OF MMI COMPANY

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ABSTRACT

The use of the Management Information System (MIS) in different top corporations in Metro Manila is to support their daily business transaction. The researcher conducted the study by using the Work-Centered Analysis (WCA) model of Steven Alter to identify the effectiveness and efficiency resulting from MIS use. The main function of WCA analyzes the process of the company from the five necessary components: architecture, performance, infrastructure, content and risks. Results of the study showed that in the home garden industry companies like MMI have tried using MIS and has seen good results, the MIS managed to bring about improvements on the business processes of MMI in terms of customer satisfaction, operational management and financial investment. MIS increased the motivation of the employees as it reduced the burden of the workload. The customers are satisfied with the use of MIS, it also save time and has reduced discrepancies and mistakes caused by human error. The MIS helped the MMI's employees accomplish their tasks quickly and more effectively. On the other hand, their weaknesses are they rely on the MIS heavily in creating the needed outputs of the company, so when the system is down, their business operations are delayed and bottlenecked.

Keywords: Management Information System, Work-Centered Analysis, Performance, Infrastructure

INTRODUCTION

Background of the Study

“In MIS, good communication skills are essential. Often you are called upon to put the tools in someone else’s hands. You must understand the requirements to build the correct tool.”
- Blake Thmpson

The use of the Management Information System (MIS) in different top corporations in Metro Manila is to support their daily business transaction. MIS typically provides periodic information by extracting information from the company databases and processing it according to the needs of the company user. MIS can be constructed in whole or in part by end users. It is also known as report generating system, which help people in the organization to make better decision.

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.

Management Information System (MIS) is an organized portfolio of formal systems for obtaining, processing, and delivering information in support of the business operations and

management of an organization. There are alternative ways in which the term MIS may be used, An MIS may be an individual information system for a specific application within an enterprise; it is also an organization component – for example, a division – responsible for information systems. MIS are formal systems built around the hardware backbone of computer and telecommunications systems. Formal computer-based information systems are not the only informational sources in an organization. Informal information sources must be cultivated and coordinated with the use of formal sources. Physical components of MIS include computer and communications hardware, systems and application software, database, personnel, and procedures (Zwass, 2015).

Rationale of the Study

The proponent's interest on the topic of Information System specifically Management Information System (MIS) began when the proponent embarked on teaching COMP1BU and COMP2BU (Computer Application for Business Management Students), ENTEMIS (Management Information System for Entrepreneurship), SYSTAND (System Analysis and Design), IS Planning and BUSIMIS (Management Information System for Business Management Students) for undergraduate of the Decision Sciences and Innovation Department – De La Salle University Manila. And besides, the undergraduate degree of proponent was Computer Science specialized in Software Technology. The proponent also plan to teach courses like INNOTEC (Innovation in Technology) in the near future. Lastly, the proponent has the interest to know what are the perceived advantages and disadvantages of using MIS among the different corporations in Metro Manila, Philippines. It is worth knowing because uses of MIS constantly helped companies to improve the way they conduct business transaction and make sure that it continues to meet their company's goals and objectives, and to cut costs and increase profits. Using MIS has changed the way the company work in recent years.

Furthermore, the 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.

Statement of the Problem

What is the current status of the MIS of MMI Company using the Work-Centered Analysis (WCA) framework of Steven Alter in terms:

1. Architecture
2. Performance
3. Infrastructure
4. Context
5. Risks

Objectives of the Study

The main objective of this research was to describe the current status of MMI Company's Management Information System (MIS) using the Work-Centered Analysis (WCA) of Steven Alter framework in able to derived their strengths and weaknesses in using MIS.

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 Marswin Marketing, Inc (MMI) 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 were 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.

REVIEW OF RELATED LITERATURE

According to Salamzadeh, et al., (2014), “All people enter organizations with a formed personality and some initial experiences and values depending on the culture, which will, in turn, influence their efficiency and performance. Therefore, great attention must be paid to work values of the employees and the issues which affect them, especially in organizations that are complex in their structure and culture. Today’s dynamic environment requires organizations to be agile in their processes, with the issue being even more critical in knowledge-based organizations such as virtual universities. In this research, we identify the path through which organizations can achieve agility by means of work values. Although there are many dimensions in work values and organizational agility, using the methodology applied in this research, we omit some of these dimensions and find the best methods that will enable managers to wisely invest in the most important issues and get the best results in the path to achieve agility through work values.”

Tajpour, et al., (2021) states that “Nowadays, because of the competitive labor market, employment and retention of talented and skilled workers has become a crucial challenge for most organizations. The exceptional value of the employer brand can create a competitive advantage for any organization. The present study aims to examine whether the employer brand affects the job satisfaction of IT department staff in Mellat bank, or not. This research is applied in terms of purpose and descriptive-correlational in terms of quantitative approach. The

statistical society of this research includes all of the IT department staff of Mellat Bank. The results indicated that reputation, organizational culture, corporate social responsibility, training and development have a positive effect on job satisfaction of employees and that they have a negative effect on diversity and work-life balance.

Chin, et al., (2019) mentioned that: “The component of corporate governance is board size, board independence, number of board monitoring committees, risk management committee. Board size and board independence are positively significant to firm value. However, board monitoring committee and risk management committee do not show any significant relationship with Tobin's Q. Board gender diversity, however, do not function as a moderating role in the relationship of corporate governance and business performance. This study contributes by explaining the relationship between corporate governance and firm value in a developing country. Policymakers and academician will be able to have a better insight into the research and this study pioneer to test the moderating effect of board gender diversity, and the relationship between risk management committee and firm value“.

In the study of Shniekat, et al., (2021), it was mentioned that “this analysis introduces productivity and results on competitive advantage variables in classified hotels in the city of Petra that impact Management Information Systems (MIS). Second, empirically, by proposing a modern research paradigm and new research establishment at the level of productivity on the Comparative Advantage (ECA) in the hotel industry, this research aims to reduce the difference in scientific research. This study is supposed to be useful for policy decision-making, especially for managers who want to develop Management Information Systems (MIS) in Hospitality industry city of Petra”.

In the study of Fillion (2012), it states that “Individual acceptance and use of new technologies has been studied extensively over the last two decades. And, as more and more organizations move from functional to process-based Information Technology (IT) infrastructure and Enterprise Resource Planning (ERP) systems are becoming one of today's most widespread IT solutions to this movement, the research literature on ERP systems has exponentially grown. To study acceptance and use of ERP systems by enterprises and their employees, several models of technology adoption are used, including the Technology Acceptance Model (TAM), as well as the Unified Theory of Acceptance and Use of Technology (UTAUT). The results highlight the key role of three independent variables (facilitating conditions, anxiety, and behavioral intention) and a moderator variable (age) of UTAUT model as influencing factors on the use of ERP systems in medium- to large-sized Canadian enterprises. The independent variable social influence can also play a less significant role ($p < 0.10$) on the use of ERP systems.”

According to the study of Radovi-Markovi, et al., (2019), “ In the conditions of a tremendous industrial advance in information and communication technologies today and in the full swing of the world economic crisis, the chances of industry and universities to survive are rather thin unless they undergo necessary changes. These changes are reflected in the interconnection of the social environment, universities and industry, which is a precondition for building a knowledge-based economy. The aim of our research is to define the extent of collaboration competency within the social network. It helps a more objective assessment in selecting prospective team members. The employee with maximum knowledge required for the project, one that can ensure a high degree of collaboration through a social network is appointed project manager. On the basis of these results a competent virtual team can be assembled, capable of effectively solving the tasks set before them.”

Based from the literatures above, the researcher gained awareness that there are increasing studies regarding information systems, TAM and UTAUT. In this age of technological advancement, information technology is used to easily process data and communicate information across different networks. One type of information technology is Management Information System (MIS). In terms of research gap, based from the literatures above, the researcher gained awareness that there are increasing studies regarding information systems and innovations. However, other aspects such as using WCA framework of Steven Alter to analyse the use of MIS in micro and small enterprises are hardly studied about, the proponent

aims to bridge this gap and provide theoretical contribution to the field of study in MIS by analysing the adoption of MIS in MMI Company using WCA framework. Moreover, previous literatures also discussed about the utilization of MIS and how organizational efficiency and effectiveness are measured.

FRAMEWORK

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.

Work-Centered Analysis (WCA) Framework

According to the Work-Centered Analysis (WCA) of Steven Alter (2014), he mentioned that: To assess the organizational capabilities of the chosen companies, the WCA framework was used as it consists of five different perspectives. The figure shown below contains the basic questions that were asked according to the perspectives and elements of the framework.



FIGURE 1
WORK-CENTERED ANALYSIS FRAMEWORK (WCA)

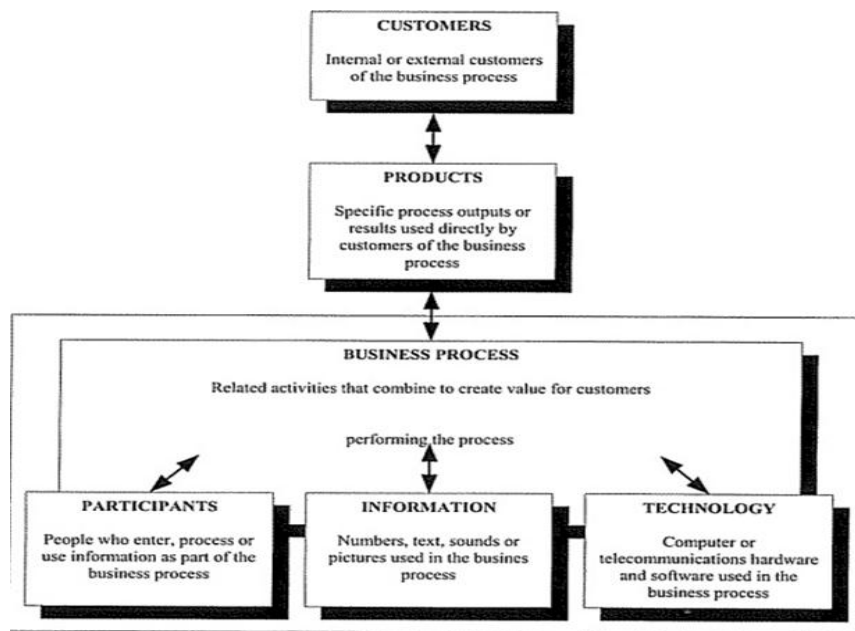


FIGURE 2
SIX ELEMENTS OF WORK-CENTERED ANALYSIS (WCA) FRAMEWORK

The Work Centered Analysis (WCA) is used to determine the potential improvement of a system by approaching several elements (Robinson, 2010). The identification of WCA can give the vision of proposed system design in increasing customer satisfaction and improving company competitive advantage.

Robinson (2010) emphasized that the main function of WCA analyze the process of the company from the five necessary components: architecture, performance, infrastructure, content and risks. Here are the following questions usually used to determine those five components:

- **Customers:** Who are the customers? How do they use the process outputs?
- **Products/Services:** What are the outputs of the process? In what direction might improvements lie?
- **Process:** What steps are included in the process? Do you need to consider them all?
- **Participants:** Who participates in the process? What are the skills and the incentives of the participants?
- **Information:** What information is used? What information is generated?
- **Technology:** What technologies does the process rely on? What are other technologies that might be considered?
- **Business Process:** What are the processes being used in the company? What are the internal and external processes that produce information, physical things, or needed in order for the business process to operate?

Operational Framework

TABLE 1 ARCHITECTURE PERSPECTIVE	
Customers	How the customers use the product? Customers' entire cycle of involvement with the product.
Products	Specific combination of physical objects, actions, and information produced by the business process for business process customers.
Business process	Summarizing process operations: major steps, link. Describing process architecture: degree of structure, range of involvement, level of integration, complexity, degree of reliance on machines, attention to planning, execution, and control, treatment of exception, errors and malfunctions.
Participants	Formal organization chart and job descriptions. Informal relationships and personal contacts.

Information	Data definition: entities included relationships between entities, data about each entry. Data organization and access.
Technology	Hardware architecture: layers of computers, networks, and peripherals. Software architecture: configuration of system and application software.

Table 2 PERFORMANCE PERSPECTIVE	
Customers	Customer satisfaction.
Products	Cost, quality, responsiveness, reliability and conformance.
Business process	Capacity, consistency, productivity, cycle time, flexibility, security.
Participants	Skills, involvement, commitment, job satisfaction.
Information	Quality, accessibility, presentation, usefulness.
Technology	Functional capabilities and limitations ease of use, compatibility and maintainability.

Table 3 INFRASTRUCTURE PERSPECTIVE	
Customers	Technical and human infrastructure the customer must have to make the product effective: training facilities and trainers.
Products	Technical and human infrastructure the customer must have to use the product at all; telephone lines, the right computers and technicians to keep them running.
Business process	Systems development and maintenance, facilities maintenance and operation, training and management.
Participants	Trainers and support staff.
Information	Corporate or external databases.
Technology	Telephone systems, computer networks and software.

Table 4 CONTEXT PERSPECTIVE	
Customers	Concerns and limitations from the customer's context that may affect usage even though they are not directly related to the product. Concerns of stakeholders other than direct customers and participants.
Products	Substitute products customers could use. Ways the customers might bypass this type of product.
Business process	Tradeoffs involving external business processes. Organizational policies, practices, politics and plans. Government regulations
Participants	Incentives Other responsibilities and job pressures for participants.
Information	Information policies and practices.
Technology	Technology policies and practices. New technology that may be available soon.

Table 5 RISK PERSPECTIVE	
Customers	Concerns and limitations from the customer's context that may affect usage even though they are not directly related to the product. Concerns of stakeholders other than direct customers and participants.
Products	Substitute products customers could use. Ways the customers might bypass this type of product.
Business process	Tradeoffs involving external business processes. Organizational policies, practices, politics and plans.

	Government regulations
Participants	Incentives Other responsibilities and job pressures for participants.
Information	Information policies and practices.
Technology	Technology policies and practices. New technology that may be available soon.

Operational Definition of Terms

- Architecture - how the current system operates, how the components are linked, and the way the components work together.
- Context - the organizational and technical realm within which the current or proposed system operates.
- Customer Satisfaction - how organization's offering meet customer expectation, needs and wants
- 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
- Infrastructure - the resources the system depends on and shares with other system.
- 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
- Organizational performance- refers on how a firm executes its operations, through utilization of inputs, that results to the intended output
- Performance - is a business description of how well the system or its components operate.
- Physical Resources – tangible assets owned and used by a company
- Risk - consists of the foreseeable events whose occurrence could cause system degradation or failure
- Strength – an advantage or benefit of an organization
- Work-Centered Analysis (WCA) - is used to determine the potential improvement of a system by approaching several elements (Robinson, 2010).
- Weakness – a disadvantage of an organization that needs to be improved

RESEARCH METHODOLOGY

Company Background

Marswin Marketing, Inc. (MMI) is a small-medium enterprise (SME) that started operating in March 15, 1993. It is a distribution company that distributes paint products, chemical products, hardware and electrical products in the Philippines. The name of the company came from the combination of the owners’ name: “MARites”, “Sany”, and “SherWIN”, thus MARSWIN. Their office is located at 408 San Nicolas St., Binondo, Manila. The company’s mission is to provide quality products and services through marketing and distribution of affordable, fast moving paints, hardware and electrical supplies in the country while adhering to its philosophy of serving the consumer with utmost integrity and excellence. The organization’s vision is to become the most preferred distributor of affordable, quality fast moving paints, hardware and electrical supplies in the Philippines.

Marswin Marketing, Inc. is known to be the number one distributor out of the top four distributors in the country. The general management of the company, together with the variety of departments is located in Binondo, Manila, which is open from 8 a.m. to 5 p.m. Its main operations of distributing paints, hardware and electrical materials are being done in Luzon. The delivery happens the whole day. All these work are done by the 150 employees of Marswin Marketing, Inc. These workers are also responsible in supplying the most of the biggest wholesales of paints, hardware and electrical supplies from Greater Manila Area (GMA). According to them, they are strongest and the largest distributor of the same products in North Luzon area. Their service boundary in the North is Quezon Province up to the provinces of La Union. The business is planning to expand in the Visayas and Mindanao regions to serve wider markets.

Currently, Marswin Marketing Inc. own 18 delivery trucks and have 4 warehouses which are all located in Valenzuela. They currently serve more than 10,000 active products. Some of the brand products they distribute are Solignum (wood preservative), Welcoat house paints, Rain or Shine, Nippon Paint, Aqua Guard, Popular everyday paint and Ismol but Teribol. They have their own brand product as well which is known as Legend, which was introduced by the company in 1996. Their own brand Legend has products for plastic wood dough, calcium carbide, and rust converter. They have two manufacturing plants for their own brand Legend which are also located in Valenzuela.

The company claims that their monthly sales are estimated to be PHP 80,000 to PHP 120,000. As of February 2016, their recorded sales for the month were PHP 90,000. Overall, Marswin Marketing, Inc. is currently doing well in the market. They hire legal counselors who help them reform the structure of the company while doing everything legally, since when they were still practicing a Chinese style in running a business before, they were not aware of the rules and regulations that are needed to be followed here in the Philippines. However, problems in the company are inevitable. The company problems include the rate of new competitors entering the market, particularly from Mainland China, is high, threat of substitute products are also high, profit margin is thin but the exposure and expense are high.

Research Design

The researcher chose to do field work for this study since it is often used to monitor human behaviors 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 interviews and field observation, 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.

Sampling Plan

MMI Company 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.

Method of Data Analysis

The proponent adapted the qualitative method of analysis in this study. This method of analyze used to analyze content from interviews of respondents in MMI company, observation from the field. Qualitative research focuses on obtaining primary data through open-ended and conversational communication, for in-depth and further probing and questioning of respondents based on their responses, where the proponent also tries to understand their motivation and feelings.

RESEARCH FINDINGS

Demographic Profile

Table 6				
DEMOGRAPHIC PROFILE OF MARSWIN MARKETING INC (MMI)'S RESPONDENTS				
Company Name	Internal Respondents		External Respondents	
Marswin Marketing Inc.	Freq count	% share	Freq count	% share
Location				
Warehouse	9	27.27%	N/A	N/A
Office	24	72.73%	N/A	N/A
Age				
18-25	17	56.67%	1	6.67%
26-30	6	18.18%	3	20%
31-35	4	12.12%	1	6.67%
36-40	1	3.03%	3	20%
41-45	0	0%	6	40%
46-50	1	3.03%	1	6.67%
51-55	3	9.09%	0	0%
56-60	1	3.03%	0	0%
Gender				
Male	12	36.36%	15	100%
Female	21	63.64%	0	0%
Marswin	Name		Rank	
4. IT Representative	Jason Figueroa		IT Administrator	

Work-Centered Analysis (WCA) and MIS analysis for Marswin Marketing

Table 7	
SCOPE OF THE ANALYSIS FOR MMI COMPANY	
Customers	<p>Internal customers: The entire company personnel including the management and employees.</p> <p>External customers: The suppliers and usual customers/clients. Paints are the products that are mostly being sold by the company.</p>
Products	<p>Paints are the products that are mostly being sold by the company.</p> <p>The products in the home and garden industry are all the same.</p> <p>Quality wise, the products being offered by the company are within the standard.</p>
Business Process	<p>The employees of the company check the available stocks in the warehouse and update it afterwards in the system. Then, the purchasing personnel will contact the suppliers with regards to the required number of stocks needed by the company. The supplier will then deliver the items to the company which will then be updated by the employees in their system. The company just sells their products to walk-in customers and long-time customers by delivery or on sight.</p>
Participants	<p>The employees of the company and management, they should have the knowledge of the different products being sold by the company. Furthermore, they should also have good decision making skills and must know how to use the company's system.</p>
Information	<p>The information usually required are the products of the company, the number of products available in storage, the list of buyers and suppliers and the number of items that always needs to be in storage. The system will alert the employees when something needs to be done.</p>
Technology	<p>No key techniques are being used by the company as long as the usual business process is consistently being done.</p>

Table 8 Architecture Perspective for MMI Company	
Customers	The employees of the company get the product in the storage desired by the buyer. It is up to the buyer on how they will further use the product bought in the company.
Products	After the customer orders from the company, the employee will give the product to the customer and payment must be made by the customer to the company.
Business Process	The employees should always be aware of what is being written down in the system since it is a way to know what are the next steps needed to continue its business cycle. Most of the employees in the main office have direct usage with the system <i>via</i> a desktop computer or laptop. If problems arise while using the system, there is a support staff whose responsibility is to fix the error that may occur.
Participants	The management or the owners are in charge of the company. There are sales staff, accounting staff, IT staff, supervisors and messengers that each has a specific role in the company.
Information	The information usually required are the products of the company, the number of products available in storage, the list of buyers and suppliers and the number of items that always needs to be in storage. Most of the employees in the main office have access to the system, with only a few who do not have access to it.
Technology	Hardware architecture: Computers and laptops are the main hardware utilized by the company to update the system and to ensure continuous business cycle. Software architecture: The company uses software called "Basic" which provides the employees with data to help them accomplish their tasks.

Table 9 PERFORMANCE PERSPECTIVE FOR MMI COMPANY	
Customers	The employees are satisfied with the current system being used by the company. On the other hand, the employees are satisfied in terms of the serviceability and quality of the products.
Products	The items come from various suppliers and each provide the company with high quality service and products that will not hinder the business processes of the company.
Business Process	The company's business cycle never ends from getting products from the supplier to reaching the end customer. There are usually no problems encountered with the process as the company provides consistent and reliable service.
Participants	Skills, involvement, commitment, job satisfaction. There are a lot of employees who have stayed with the company for many years already, with a number of applicants being hired yearly. The management ensures that the employees are given the right incentives to make them feel satisfied and committed to their jobs.
Information	Quality, accessibility, presentation, usefulness. The system can easily be accessed by people who are permitted by management. There are also restrictions and limitations to which part of the system they can access. It is very useful as the data in the system is very clear and real time allowing the employees to have an easier time in terms of decision making.
Technology	The system can be accessed with or without internet as long as users are connected with the network in the main office. However, updating data from the main office to the main warehouse requires internet. Usually, the internet being used by the company is stable and reliable.

Table 10 INFRASTRUCTURE PERSPECTIVE FOR MMI COMPANY	
Customers	The customer should have basic knowledge with regards to the business process and system used by the company. The company allots training days for new employees and always has available personnel to help.
Products	Computers and telephones are the main hardware's being utilized by the employees to reach out to their customers. There is available support staff to aid them when they have questions or suggestions.
Business Process	The company usually conducts training when a big and new update comes out for the system. There are external IT personnel who come and check the system for maintenance and problems.
Participants	In terms of educational attainment, a high school diploma is enough to be employed in the company, but some positions also require a college degree. All of the employees are

	trained by management and their respective department co-employees. In terms of the usage of the system, the IT Admin of the company is in charge of training the employees with regards to its usage while an external IT personnel is available to provide additional support if needed.
Information	The company also uses a sequel server to support their business needs, but mostly the system “Basic” is being used consistently by the company.
Technology	The software/program being used by the company is called “Basic”. The company uses intranet for the main office and internet to reach the warehouse in Valenzuela.

Table 11 CONTEXT PERSPECTIVE FOR MMI COMPANY	
Customers	The company’s departments are located in various floors where some departments are more knowledgeable than the others in terms of the usage of the system. Some departments are given more importance by the management which can create jealousy among the employees. However, management is good in taking care of the employees and ensures that each department has a specific role in fostering business cycle continuance. The home garden industry is a big industry and this means the presence of many formidable competitors for Marswin.
Products	Apparently no available substitute product/system can be used by the company to support its daily business processes. However, one way is to do the processes manually without the use of computers but this is less efficient and more time consuming. At any rate, the customers would still be receiving the same products by the end of the company’s business processes.
Business Process	The organizational culture of the company is quite relaxed, wherein one employee from another department can do the job of an employee from another department. Management does not focus on how the employees did their job as long as they finish their job for the day. The company also adopts a top down approach in the company wherein the management is strictly in charge of the all decisions made. The company follows the rules and regulations as given by the government.
Participants	The company gives monetary incentives for perfect attendance of an employee, which helps enable the company to have a continuous business cycle. Promotion also depends on the performance of an employee and not by longevity. Both of which can add more pressure to the participants in terms of trying to do beyond what is expected from them. Since, the employees are required to attend work 6 times per week and also know that they can be easily replaced by anyone and anytime if the management wants to do so.
Information	The employees are not allowed to have a copy outside of company location, wherein the information are all highly confidential and is only for company use.
Technology	The employees should use and handle the hardware of the company with care. For malfunctions, the employees can approach knowledgeable colleagues for assistance. The company is planning to make the entire system into an internet based one so that it can be viewed even when the users are overseas.

Table 12 RISK PERSPECTIVE FOR MMI COMPANY	
Customers	There are numerous employees who did not like the system before, but soon were able to embrace the efficiency it brings to their work. There are still a lot of employees who do not fully know what to do with the system and needs constant supervision.
Products	Failure of an employee to update the system can have an adverse impact on the decisions made by other employees.
Business Process	Some employees do not properly check the warehouse or storage room for the real amount of products available. Usually, employees’ computers have their username and password written in a sheet of paper beside their monitor and this can allow other employees to easily access their computers. If the internet goes down, the updates from the warehouse in Valenzuela cannot be reached. Someone from the main office has to manually go to Valenzuela and get the data.
Participants	Some employees are still not able to understand how to use the system and thus need constant supervision.

Information	Data errors are usually caused by users when wrong data is encoded. Another possible hindrance with the computers are the sudden appearance of viruses which can delete information of a computer or the system.
Technology	Some computers being used in the company have been used for many years and no back-up or replacements are available until the computer breaks down. The software can sometimes have bugs which can disturb or stop the work of an employee.

WCA to assess Strengths and Weaknesses

The WCA framework is used here to divide the strengths and weaknesses of MMI Company and put into the 5 perspectives of the framework, which are: architecture, performance, infrastructure, context, and risk. The contents of the framework are derived from the information available in the survey and interview results which were meticulously rearranged to form a simple summary table for easier understanding (Table 12).

Strength

Table 13 STRENGTHS WCA SUMMARY	
Perspective	Marswin Marketing Inc.
Architecture How the current system operates, how the components are linked, and the way the components work together.	<ul style="list-style-type: none"> • Current hardware and software is fully utilized • Some of the equipments are old but still runs smoothly • The management and employees all have well defined roles
Performance Is a business description of how well the system or its components operate?	<ul style="list-style-type: none"> • Employees have sufficient knowledge regarding their own roles and the company's products • Management ensures employees are satisfied with their jobs
Infrastructure The resources the system depends on and shares with other system.	<ul style="list-style-type: none"> • Management always ensures that the employees are sufficiently trained to handle the current system and possible system enhancements
Context The organizational and technical realm within which the current or proposed system operates.	<ul style="list-style-type: none"> • The company emphasizes in finding ways of continuous improvement regarding the productivity of its employees
Risk Consists of the foreseeable events whose occurrence could cause system degradation or failure	<ul style="list-style-type: none"> • IT Admin and the different department heads are properly supervising the system and motivating the employees.

For MMI Company, the MIS helped the employees accomplish their tasks quickly and more effectively. The system has its hardware and software fully utilized and updated. Thus, fewer issues are occurring in their company. Since the implementation of the MIS happened, it paved way to growth and improvement of the company. Furthermore, the admins and management are properly supervising and motivating their employees, thus, it creates a positive impact with their work (Table 13).

Weaknesses

Table 14 WEAKNESSES WCA SUMMARY	
Perspective	Marswin Marketing Inc.
Architecture How the current system operates, how the components are linked, and the way the components work together.	<ul style="list-style-type: none"> The MIS of the main office and warehouse are separate. In the event of a broken connection, the company would have to resort to manual processing
Performance Is a business description of how well the system or its components operate?	<ul style="list-style-type: none"> The current system is heavily reliant on the internet speed, which is usually slow
Infrastructure The resources the system depends on and shares with other system.	<ul style="list-style-type: none"> Due to majority of the employees being slow to learn new technology the IT Admin and management focuses only teaches the things needed for their respective roles
Context The organizational and technical realm within which the current or proposed system operates.	<ul style="list-style-type: none"> Though management encourages innovation, employees would rather not initiate as they fear that they may be reprimanded or worsen the relationship with their bosses.
Risk Consists of the foreseeable events whose occurrence could cause system degradation or failure	<ul style="list-style-type: none"> Cyber-security is a major threat for a small company like Marswin; especially since the employees are not very knowledgeable regarding their respective computers and data.

For Marswin Marketing Company, they rely on the information system in creating the needed outputs of the company so when the system is down, business operations are delayed. The employees somehow have a difficult time contacting employees in another department. Moreover, most of the employees are not that knowledgeable about the technological aspect of the system (Table 14).

CONCLUSION

The Work Centered Analysis is a tool which has assessed the MIS of the companies. The WCA showed the current status of the company's architecture, performance, infrastructure, context and risks. In terms of the system's architecture, the companies use a desktop and a network to run the system. The software is important because the program will not run without it. The system helps its customers analyze and produce data, thus, the system is reliable. Furthermore, the data input is needed to generate the needed data by the users.

In terms of performance, the users are satisfied in using the system. As it has lessened their burden, it also has paved way for accurate and reliable data generation. As the processes of the company has become automated, the users received proper training to effectively and efficiently operate as well as manage the system. Furthermore, the system is accessible and has a friendly interface.

The MIS infrastructure of the companies is somehow similar with each other. Computers are needed to keep the program running and updates are being done to catch up with the recent improvements and changes with the system. External IT personnel are present whenever needs or problems arise. They help maintain the company's system. All the data produced by the system are disclosed for documentation purposes.

In terms of the context, MIS has created an impact to its users. At first, there was a difficulty of shifting from the old to the new system; however, it did not last. The companies

created policies from which the users are guided in properly operating the system. Moreover, security is of utmost importance especially as it pertains to the system's data; thus, maintenance is done regularly to assure the reliability of the system.

The system's exposure to risk is not that alarming. The risks are highly dependent on how the users encode data and how the system is being managed by its users. Failures and errors might happen when inaccurate data is encoded in the system. However, equipment failures happen from time to time. It is experienced by the companies and it somehow cannot be avoided. Thus, the companies exert their best efforts to maintain the system and this is done by maintaining good relations with their vendor.

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 MMI 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 literature and assessing the results of both surveys and interviews, the researcher summarized the business practices that organizations in the home and garden industry : 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 MMI Company

Marswin Marketing should also consider building an IT team, as they are currently dependent on the sole IT person Mr. Jason Figueroa. There may come a time when he alone may not be enough to handle the technical problem/s so an additional staff member to aid in system maintenance must be hired.

Additionally, it would be advisable for the employees to receive additional training in using the system since the employees are somewhat unsatisfied with the current training they had. Doing so would increase their competence and satisfaction. The employees should also be trained with even the basics of internet and computer security in order to prevent cyber-attacks.

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 analyzing 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.

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