Evaluating the Open Citrus Information System Success at Citrus Products of Belize

Darwin Aleman
University of Belize
#19 Venezuela St.
Belmopan city, Belize
2014110699@ubstudents.edu.bz

Keilly Nah
University of Belize
#16 University Crescent St.
Belmopan city, Belize
2014110713@ubstudents.edu.bz

Laura Moore
University of Belize
Steadfast Village, Stann Creek District
2014110712@ubstudents.edu.bz

Darrin Juarez
University of Belize
Cristo Rey Village, Cayo
2014110706@ubstudents.edu.bz

Abstract

Presently, technology has a great impact on the daily operations of many businesses. Some businesses have also implemented information systems to support business functions. Information systems are seen by businesses as investments rather than expenses because it is supposed to benefit and bring gains to the business. However, many businesses have not validated their information systems to evaluate its success.

Therefore, a research was conducted in Belize to evaluate the effectiveness of information systems used in the country. A quantitative research was conducted at Citrus Products of Belize (CPBL) in Belize, in order to determine the effectiveness of the "Open Citrus" information system that they have in place for production. Information was collected through a survey conducted at CPBL on March 25, 2017. The Findings provide valuable results that evaluates the success of such information system using DeLone and McLean's information success model.

Keywords: Open Citrus, Citrus Products of Belize, effectiveness, success model, net benefits

Introduction

Most organizations in all sectors are fundamentally dependent on their information systems and information technology (Dewett & Jones, 2016). Both Information Technology (IT) and Information Systems (IS) have become a vital and integral part of every business. As defined by Kenneth & Jane Laudon (2012), information technology consists of all the hardware and software that a firm needs to use in order to achieve its business objectives. Kenneth & Jane Laudon also defined an information system as a set of interrelated components that collect (or retrieve), process, store, and distribute information to support decision making and control in an organization. IS improve an organization by providing relevant information to managers for them to make informed decisions. Failure of IT or IS in an organization can cause serious problems because its business processes will be hindered or unable to be carried out. Therefore, an organization invests large sums of money to implement IS and IT and to ensure that it is running properly and being utilized efficiently.

IS are implemented to provide real-time information at all levels of management. Many companies develop in-house information systems in order to design it to fit the organization's needs and aid in achieving business goals. In house IS are designed to provide information needed in accordance to each department. Although information systems are being implemented to suit each type of organization, one major type of organization which benefits the most from information systems are manufacturing companies. IS are implemented in manufacturing companies to facilitate the processing of large and complex amounts of data. Manufacturing companies have to keep track of production from the moment the raw materials are received way to the delivery of the end product. The company has to ensure that enough raw material is available, when to order, and the quality of the material. They also have to ensure that enough products are being manufactured to meet demand and that it is being produced in a timely manner. When the goods are finished, they keep track of how many products are in stock and how many to deliver. IS facilitates the collection, processing, storage, and distribution of this huge amounts of data.

Citrus Products of Belize has developed an in- house information system to aid them in collecting, processing, and storing data and distributing information to managers and employees. The information system developed, OpenCitrus, was designed with the purpose of having all production data in a single system and provide real- time information to managers and employees for informed decision making. The system is designed to capture production and delivery data. It enables trace-ability of the origin of the fruit to the final product.

The system is utilized the moment the delivery truck carrying the citrus arrives at the gate. The truck drivers have a ticket which is scanned at the gate to ensure that the delivery is scheduled and expected. The system automatically updates that the delivery for that specific supplier has arrived. The trucks are then weighed and samples of the fruit are taken to pass through a maturity test. The test determines if the fruit is accepted or rejected. Factors such as the acidity, sweetness, and type of the fruit are tested to determine if the fruit is in the best conditions to produce high quality juices and concentrates. The system captures and creates a record for each load of all the testing information done. When it comes to actual production data, the system records the number of batches of each product manufactured. It keeps track of how much product was produced with the amount of raw material. This is also automatically updated in the system by producing a product code. After the manufacturing is done the final product passes through quality testing to determine if it meets the required standards. All this information is linked to the system also. The system is also updated every time the stock is moved. This allows traceability and enables managers to know which batch came from which delivery and from which supplier. The system automatically generates reports such as daily fruit delivery summary, daily fruit production summary and, daily fruit delivery summary. This information and reports are available at all levels of management, of course with certain restrictions depending on your position in the company, in order to provide managers and employees with real-time information.

CPBL has invested significant amounts of money in this system and it is important to evaluate whether the system is useful and efficient to users of the system. Therefore, this paper is intended to evaluate the OpenCitrus information system based on the DeLone and McLean information system success model. This paper commences by firstly providing background information on the DeLone and McLean information success model and information systems for manufacturing companies. Secondly, the hypotheses are proposed based on past findings. Thirdly, the methods of data collection, instrument, and sample size are presented. Fourthly, results and analysis of the results are discussed. And lastly the implications, recommendations, limitations and future research of the study are presented.

Literature review

A large number of studies have been conducted during the last decade and a half attempting to identify those factors that contribute to information systems success (DeLone & McLean 1992). Different researchers have address different aspects of success, which is difficult to develop a "Cumulative tradition for IS". Therefore, to address such problem a taxonomy was introduced which consist of six dimensions: System and Information quality, Use and User Satisfaction, Individual and Organizational Impact; the different success measure fall under one of these dimensions. The Interrelation and interdependence between the dimensions form the model of success. This model should provide guidance for future

research since it provides a more comprehensive view of IS success, organization of research into a more understandable manner, they help explain the conflict arise from research and point of where much work is needed.

Therefore, on a late date, DeLone and McLean reformulate the D&M IS success Model developed in 1993, so to incorporate all contributions made for the model. The “Service Quality” was added to the quality dimension of the model. DeLone states that the dimension in quality should each be measured separately because otherwise it affects the other stage: “Intention to Use”, which was suggested instead of “Use” alone, because Intention to use is an attitude, and will also affect the “User Satisfaction”. In the last stage, the “Individual and Organizational Impact” were grouped as “Net Benefits”, but still preserves the nature of the Model.

After the development of the D&M model measures for the success are being analyzed. Information system success is summarized by the measures applied to the evaluation and by examining the relationships that comprise the D&M information system success in individual and organizational context. Organizations are moving beyond traditional financial measures to measure the success of an information system. In an effort to better understand the benefits of an organization information system, organization have turned to methods such as balanced scorecards and benchmarking (Petter, DeLone, & McLean, 2008).

Many businesses are increasingly using information systems to achieve performance improvement, sustainable competitive advantage and opportunities to secure long-term success. In the article written by Ghobakhloo & Tang states that information system success is not limited to the technological factors identified in the DeLone and McLean information system 2003 model (2015). An information system success is also determined by some key organizational and environmental determinants. The involvement of both top management and employees in different stages of the information system implementation is likewise important.

A successful information system will involve the use of modern technology, following industry “best practice” software standards, and delivering ‘error-free” performance. Meeting customer expectations of information system quality is accomplished by offering appealing, user-friendly interfaces, entertaining user requests for changes, and satisfying the stakeholders of the information system. In reference to article written by Gorla, Somers, & Wong, an increased on organizational dependence on information systems drives management attention towards improving information systems’ quality (2010). There is a positive relationship between system quality and information quality. It demonstrated that the information system service quality is the most influential variable in the model followed information and system quality, thus highlighting the importance of information system service quality for organizational performance.

The study of Oladejo Samson (2013) states that there are three main types of MIS that can be applied in a manufacturing firm which are: Financial Management Information System (FMIS), Marketing Management Information System (MMIS), and Human Resource Management Information System (HRMIS). He states that FMIS deals with the creation of reports about a company’s past and present money activities. This helps the company monitor cost. On the other hand, MMIS handles product creations, sales, prices, advertisements and future business decisions, while HRMIS manages employees and selection of employees. MIS saves time and resources while reducing operational costs. He concludes that MIS has significant impact on the manufacturer’s performance and decision-making.

Data managers stated that their two top priorities are “aligning management information systems with business goals” and “data utilization”. Manager rely on real- time information for statistical and fiscal control in optimizing factory processes as they occur (Boggs, 1990). In- house software packages are used to integrate and control production operations as well as floor support operations such as inventory movement and setup. Real time data provided by management information systems become the guarantor of the system. According to Boggs (1990), strategic decisions are inseparably linked to the information systems planning process.

According to Peniak (2006) information systems do not only provide information for control of production, they are also designed to capture real-time data and help manufacturers take action in the moment based on that information. The plant floor requires an active system that provides immediate detection of any non- conformance event. Because of this many companies have implemented

Manufacturing Execution System (MES). Such systems provide dispatching of manufacturing processes, accurate and timely production and inventory data and elimination of manual record keeping (Peniak, 2006). Information systems must be implemented in an appropriate way to enable necessary processes and allow value creation.

Failure in the manufacturing process can be caused by the lack of specific DSS and MIS to properly support management decisions for manufacturing organizations (Ronen & Pass, 1992). Managing manufacturing data is more difficult because it deals with controlling the manufacturing process of hundreds of products, each with its unique composition. Inventory levels of the various components have to be monitored, missing materials have to be order, and many more procedures have to be monitored. According to Ronen & Pass (1992), for the implementation of manufacturing information systems, management techniques such as Just in Time, Group Technology, and Synchronized manufacturing should be implemented. Manufacturing data is complex and large in variety therefor proper information systems must be implemented.

The study conducted by M. Kuppili and Dr. A. Aryasri (2012) concluded that after the implementation of MIS, some issues and challenges faced were that there was not enough documentation available to understand how to use and manage the data while working through MIS; not many trained professional; and the overall planning activity was not proper. Therefore, after the implementation of MIS employees have to be trained on how to use the system effectively. MIS must be evaluated to ensure in it effective in order for it to be an investment for business growth.

Methodology

Construct Measurement

The instrument used for the carrying out of this research is a questionnaire. The instrument results are quantitative data that have already been used and verified in prior research. The measurement items used were as follows: Complementary technology quality, information quality, system quality, service quality, user satisfaction, use and perceived net benefit.

To measure the construct of information quality, a seven-item scale which was developed by Bailey and Person (1983), which is a recognized and standard instrument in the IS filed, was used. Instruments were measured using a 5-poiny Likert Scale ranging from strongly agree (5) to strongly disagree (1), High (5) to Low (1), Outstanding (5) to very poor (1).

Sampling and data collection

To properly carry out this research, primary sources of information were used. The type of research is a quantitative research, questionnaires were issued to gather information from the population. The questionnaires were delivered physical to the participants. Our research is based on the Open Citrus information system that Citrus Products of Belize Ltd. (CPBL) employees use in the production process. Therefore, the questionnaires consist of questions that gathered information about the benefits provided by the system to the company's daily operations that will allow us to evaluate the effectiveness of the system. Our target population would be CPBL employees that use the above said information system. Our target population consist of 50 employees from different departments, our sample size used for the answering of the questionnaire are 40 employees, which were randomly selected. A random sampling was used so that all employees that use the system had the same probability of being chosen. Of these 40-questionnaires issued to the employees, only 30 were returned, which is a fair sample size to gather information about the information system which will provide substantial quantitative information regarding the research that will assist in evaluating the overall effectiveness of the Open Citrus information system.

Research Model

As previously mentioned, the model that this research is using in evaluating the Open Citrus information system is the DeLone and McLean Information System Success Model, often referred to as D&M IS Success Model. The DeLone and McLean model is the most referenced model for IS success. The original model contained six inter-related dimensions which are: System Quality, Information Quality, Use, User Satisfaction, Individual Impact, and Organizational Impact. From a ten-year use of the model and based on empirical research, the model was updated in 2002. This update saw the addition of a new dimension called Service Quality to the two original characteristic systems – System Quality and Information Quality. Also, it saw the addition of Intention to Use as a part of Use and it saw the collapse of Individual Impact and Organizational Impact into one single variable called Net Benefits.

According to DeLone and McLean (2002), System Quality, Information Quality, and Service Quality should be measured separately because if joined, they will affect Use or User Satisfaction. System Quality is measured in terms of ease-of-use, functionality, reliability, flexibility, data quality, portability, integration, and importance. System Quality is a vital variable in User Satisfaction and Use. Information Quality is measured in terms of accuracy, timeliness, completeness, relevance, and consistency. Service Quality is measured in terms of tangibles, reliability, responsiveness, assurance, and empathy. Service Quality is an important measure for IS Success.

DeLone and McLean (2002) further stated that Use and User Satisfaction are interrelated. Use must lead to User Satisfaction in a process sense, but positive experience with Use will lead to greater User Satisfaction in a casual sense. Additionally, increase in User Satisfaction will lead to increase in Intention to use and therefore Use. Finally, Use and User Satisfaction will create certain Net Benefits.

CPBL's Open Citrus IS measures complementary technology quality in terms of the accessibility of the Open Citrus IS. Furthermore, it measures computer self-efficacy in terms of how the users can complete their task that needs to be done when no one is around. Additionally, CPBL's Open Citrus IS measures Information quality in terms of accurate information, relevant information, understandable information, and up-to-date information. Similarly, Service quality is measured in terms of updating the software, support to fix problems, and services provide to the IS. System quality is measured in terms of ease of use, user friendly, and high-speed information access. Use, on the other hand, is measured in terms of the dependency and frequency of use of the IS. User Satisfaction is measured in terms of the level of expectation and satisfaction the IS provides to its user. Lastly, net benefits are evaluated in terms of if the IS helps improve job performance, save cost, achieve the organizational goal, and increase productivity.

The arrows in the D&M IS Success Model, Figure 1 shown below, shows proposed associations among success dimensions. It also contains the hypotheses of the study being conducted.

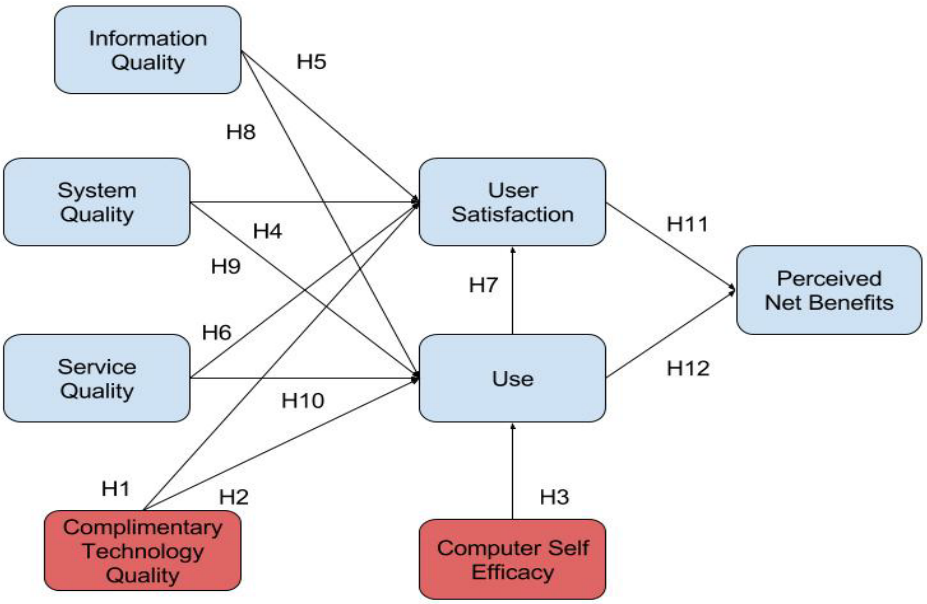

Figure 1. Modified Research Model

Hypothesis

The study hypothesized the following 12 hypotheses tested:

H1. Complementary technology quality will positively impact user satisfaction.

H2. Complementary technology quality will positively impact system use.

H3. Computer self-efficacy will positively impact system use.

H4. System quality will positively impact user satisfaction.

H5. Information quality will positively impact user satisfaction.

H6. Service quality will positively impact user satisfaction.

H7. Use will positively impact user satisfaction.

H8. Information quality will positively impact use.

H9. System quality will positively impact use.

H10. Service quality will positively impact use.

H11.User satisfaction will positively impact perceived net benefit.

H12.Use will positively impact perceived net benefit.

Data Analysis and results

The researchers gathered information by distributing 30 survey questions which had questions based on the DeLone and McLean model for IS success. All participants were employees of CPBL because they are the only users of the system. The system is not being used by external users which are the growers due to privacy and security issues. The table below demonstrate the employees' background information which they provided on the questionnaires.

The table below is the background information of the employees who participated in the survey. The age range of participants from customers range from less than 20 years to 45 years. This shows that CPBL has a young labour force. The majority of responds were males which totals to 70% while only 30% of the respondents were female. Majority of the employees' who possesses a high school degree apart from managers who holds a Bachelors and the supervisors who holds an Associates.

Table characteristics for employees

Education		Job Position		Years of working	
PhD	0%	**Manager**	13%	**1-3**	1%
Masters	0%	**Forman\Supervisor**	10%	**4-7**	37%
Bachelors	13%	**Employee**	77%	**8-10**	50%
Associates	10%				
High school	77%				
Primary school					

Table 1

Gender		Age		Experience with computers	
Male	70%	**Less than 20 years**	20%	**1-9**	20%
Female	30%	**From 20 to 30**	63%	**10-18**	33%
		From 31 to 45	17%	**19-27**	46%

Table 2

Information Quality

The result for the information quality about the OpenCitrus information system varies among the employees. It may be due to the fact that only one section of the production department fully utilizes the system. There are five statements under this section is given a distinctive identification: 2a, 2b, 2c, 2d, 2e, 2f, 2g, 2h and 2i. Below in figure 1 illustrates the response of the customers ranging on a scale of 1 being strongly disagree to 7 being strongly agree.

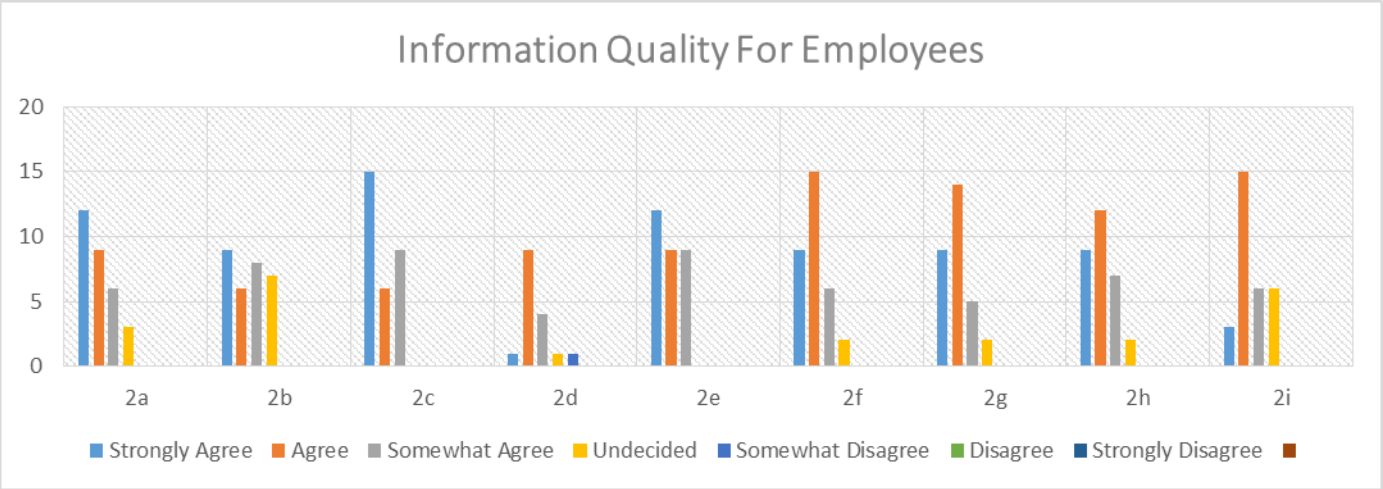

Figure 2

System Quality

The system quality for the OpenCitrus IS was measured using 4 statements. They were also distinctly identified as 3a, 3b, 3c and 3d. The statements used to evaluate its features which are to see if the system was easy to use, whether it was user-friendly and if it provided high-speed information access. Figure 2 below illustrate the results from the users.

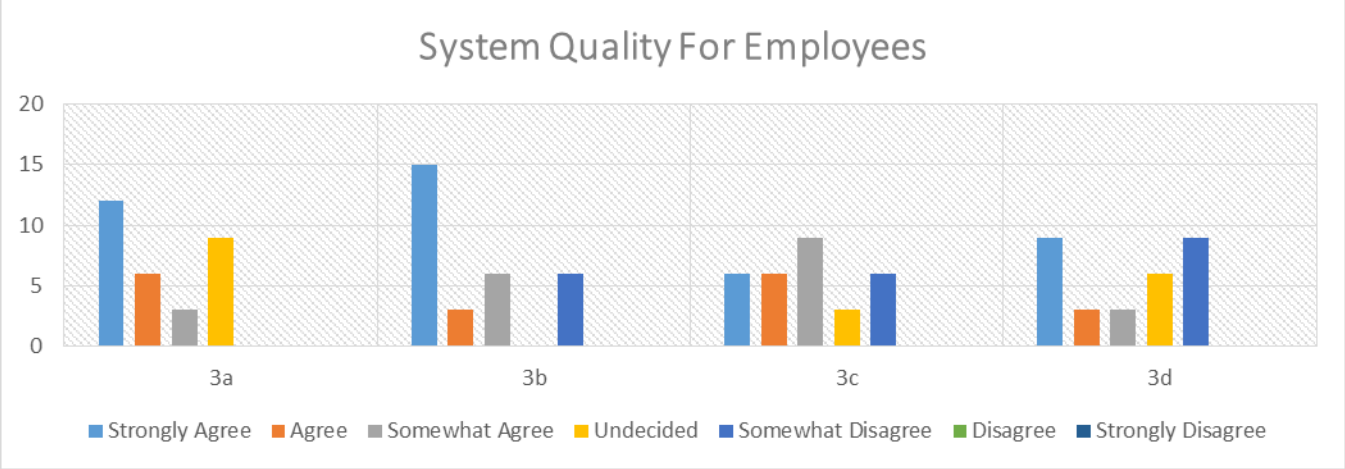

Figure 3

Complementary Technology Quality

Figure 3 below illustrate the responses from the user for the complementary technology quality. The sections evaluate the accessibility of the OpenCitrus information system. Likewise, under this section a distinctive identifier is used which are 4a, 4b and 4c. From the graph below it is shown that only 13% of the users strongly agree that the system is assessable. While, 20% agree, and majority being 30% somewhat agree to the statements under this section.

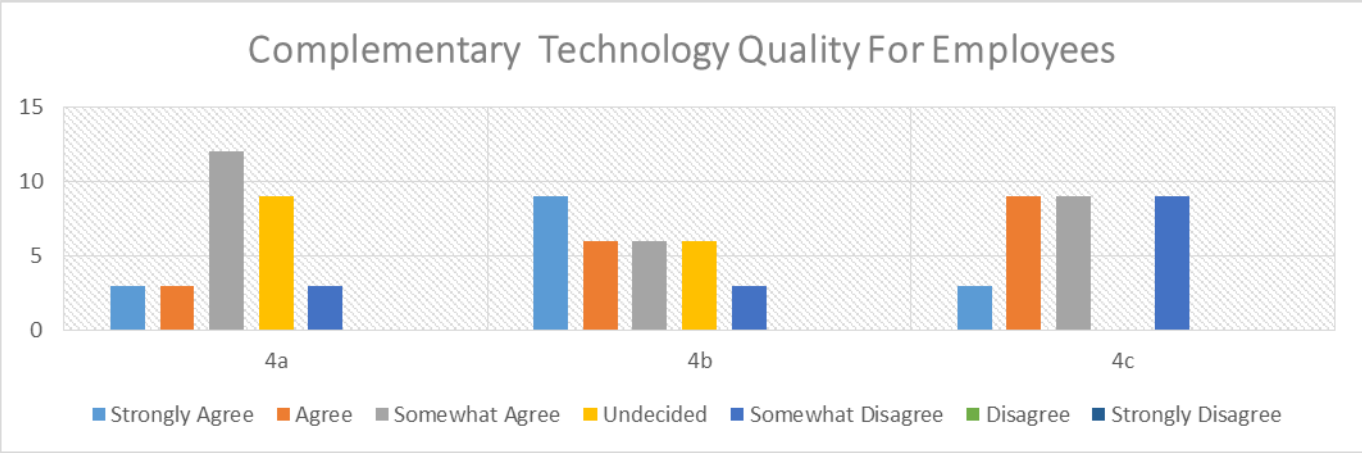

Figure 4

Computer Self-Efficacy

The computer self-efficacy was also evaluated and the responses from the users are shown in figure 4 below. This section also has 10 statements that were distinctively identified with letter a-j. This section focuses on how the users can complete their jobs using the information system when no one is around since the developer of the system indicated that the system is very user-friendly. The response varies among the users due to their job requirements, their experience and their education. Approximately 75% of the respondents' response where range from undecided to strongly agree.

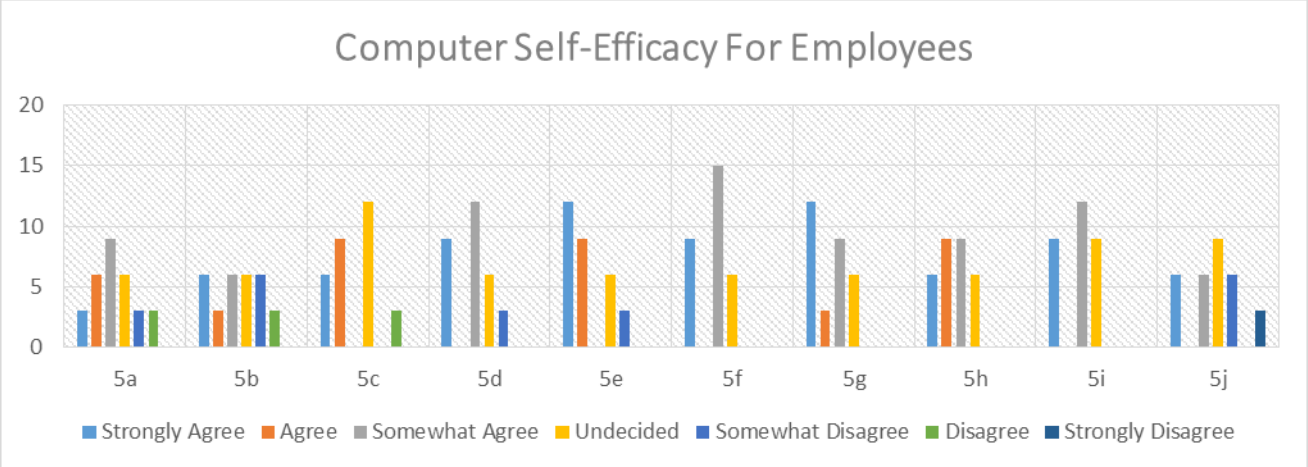

Figure 5

System Use

Figure 5 below illustrate the response of the users in reference to the system use. Each statement was distinctively identified as 6a, 6b, 6c and 6d. The OpenCitrus system is the centre piece of the production department. It is used to track fruits from when it's being delivered by the growers to the factory until the

juices and concentrates are being produced. However, only the logistic department which falls under the production department fully utilize this system. Of the total respondents 33% strongly agree to the 4 statements under this section. While 25% agree, 20% somewhat agree and another 20% were undecided.

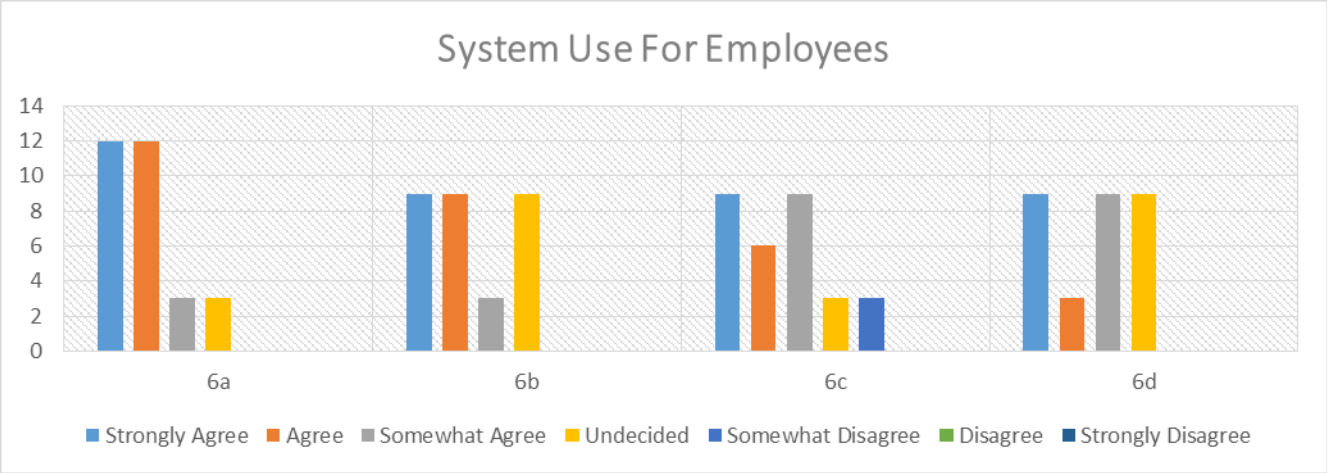

Figure 6

User Satisfaction

Below is figure 6 which illustrates user satisfaction. User satisfaction is important for CPBL because it's a viewpoint of how well the system is performing and if the users are satisfied of the way it operates in order for them to perform their daily duties. Under this section, there were four statements that was uniquely identified as 7a, 7b, 7c and 7d which shows if customers are satisfied with the information system. Of the 30 respondents 22% strongly agree that the system provides user satisfaction, 8% agree, 30% somewhat agree, 10% are undecided and 5% somewhat disagree.

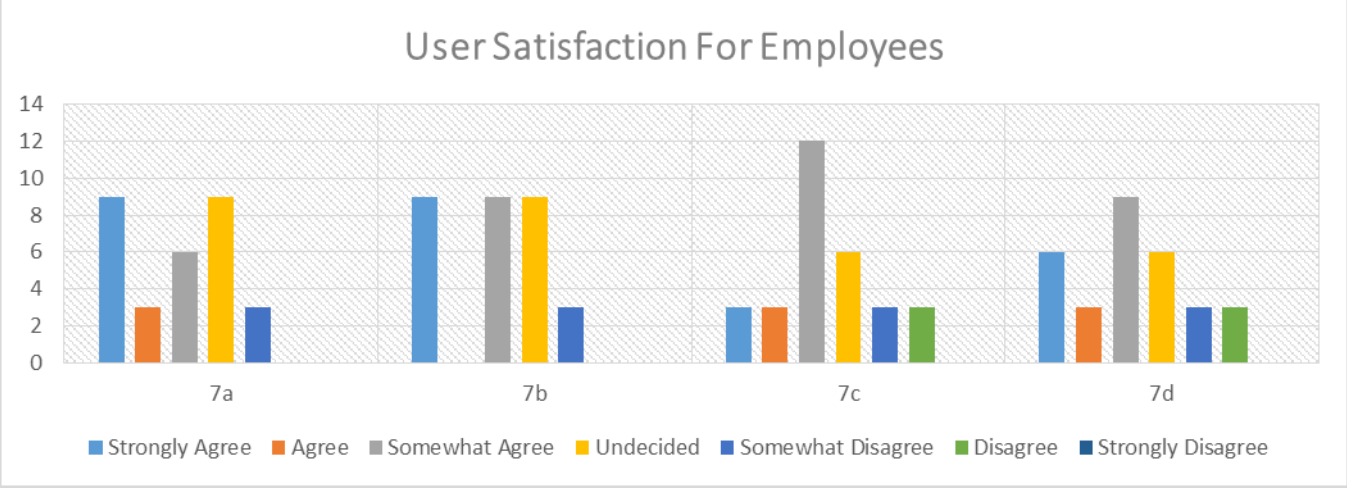

Figure 7

Service Quality

The service quality of the OpenCitrus was also evaluated in order to get an insight of how well the service quality is throughout the information system. This section has four statements that are used to evaluate the service quality each statement was distinctively identified as 8a, 8b, 8c and 8d. Figure 7 below illustrated the users' response in regards to service quality. Majority of the employees which sum up to 80% states that the system is up to date. While 70% indicate that the support staff shows sincere interest in solving problems that may arise however, only 60% indicate that the support staff respond promptly to solving the problem and 70% indicates that the support staff does not informs the users when the services will be performed to fix the problems.

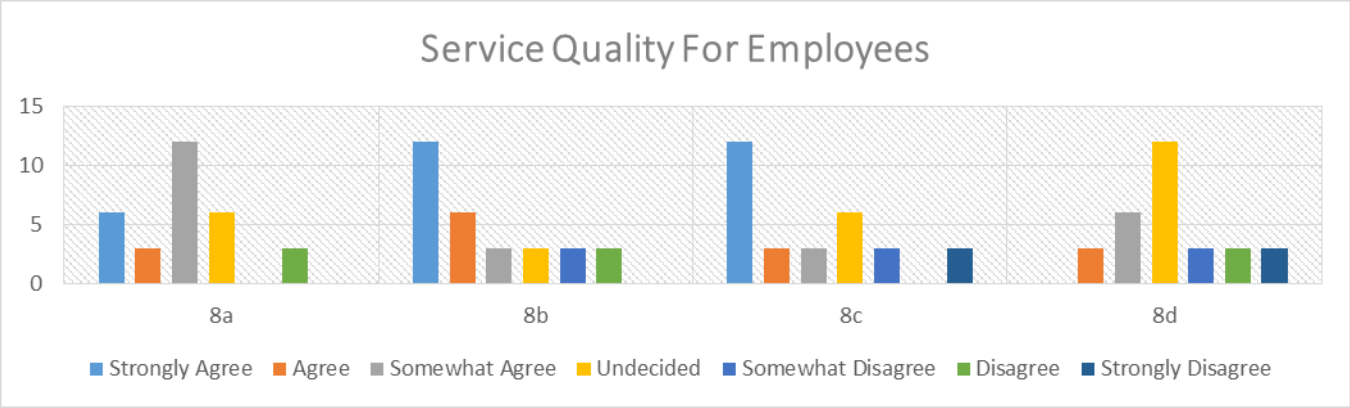

Figure 8

Perceived Net Benefit

Figure 8 below shows the results from the users whereby 30% strongly agree, 10% agree, 30% somewhat agree, 20% are undecided and 10% somewhat disagree to the statements about the information system used in the production department that helps CPBL achieve its goals. The system helps improve the job performance of the employees, save cost for the organization as well as increase the employees' productivity.

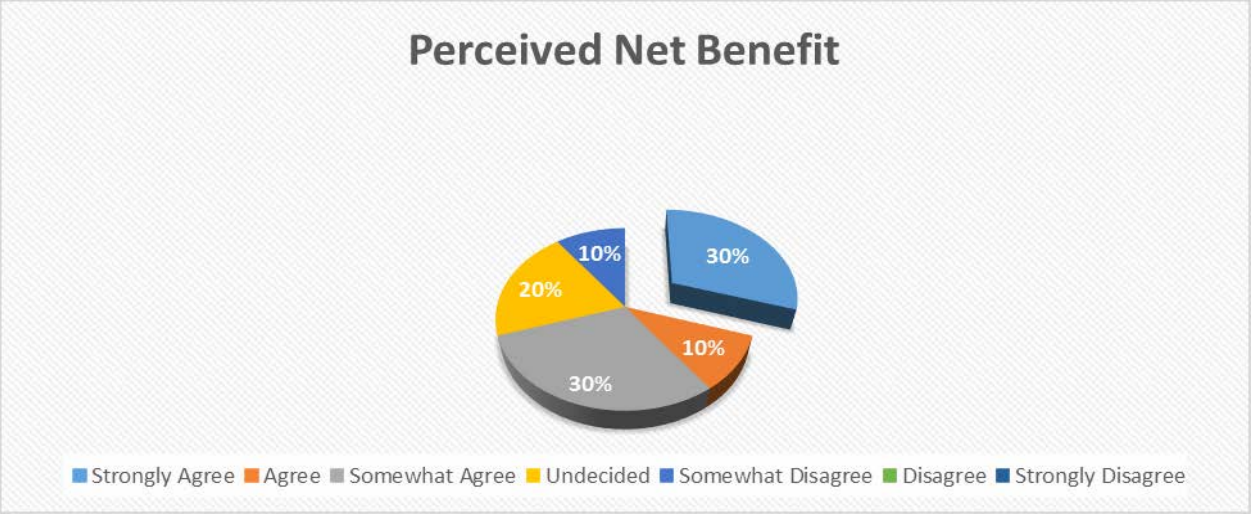

Figure 9

Discussion, Limitation and Conclusion

As previously mentioned, the sample size targeted was 40, but only 30 participants returned their responses. Therefore, the results are limited to these 30 responses obtained. Bases on the responses we can reach to the conclusion that the OpenCitrus IS does affect positively the daily operations of CPBL and does contribute to the success and achievement of its goals. The implementation OpenCitrus IS had brought great benefits to overall performance of CPBL. Since, prior to the OpenCitrus, all the business process in the production department where done manually. Therefore, the development of the OpenCitrus was of much benefit to the company. Since, many task were automated, with the use of the IS developed. Data managers stated that their two top priorities are "aligning management information systems with business goals" and "data utilization". Manager rely on real- time information for statistical and fiscal control in optimizing factory processes as they occur (Boggs, 1990). This is very important because if the IS developed aligns with the goals of CPBL then the probability of success would be high.

According to the DeLone and McLean (2003) Model of Information System Success, the perceived net benefits is best used to judge the overall success of the information system. Based on the study conducted at CPBL, the average participant's response for the net perceived benefits indicates that the OpenCitrus IS is moderately successful. However, such results cannot be generalized since, the response were limited to only 30 questionnaires received from 40 issued, which does not give a very accurate result about the IS used and its effectiveness. We could make an inference that some of the participants did not use the system much therefore, their answers do not contribute to evaluating the system. For these reasons, the average response was moderate.

They were two limitations encountered while conducting the research. One of them being the time constraint, the time affect the results obtained from the research conducted. Due to the fact, the Management Information System course includes other projects and assignment apart from the Final Research Project. Therefore, conducting the research and working along with the other assignment was somewhat challenging to complete. Only, free breaks were used to work on the research hence, the reason for the difficulty in completing the research.

Another limitation would be the amount of responses we obtained from our sample size. Our Sample size was 40 CPBL employees therefore we issued 40 questionnaires. Unfortunately, only 30 were returned to the group, which limited us with information. This could be due to the fact that not much employees use the Open Citrus IS.

The main purpose of this research was to evaluate the effectiveness of the OpenCitrus Information system use at CBPL of production. It was concluded that the IS used at CPBL brings great benefits to the production process. This research has addressed the concern for of measuring the success of the OpenCitrus IS. Therefore, a success model was developed based on DeLone and McLean (2003) updated IS success model. The results show that information quality, system quality, service quality, use, user satisfaction, and perceived net benefit. Therefore, we can say that CPBL is benefiting with the Open Citrus Information System.

References

Boggs, R. (1990). Production Information Systems: Practical Considerations and Concerns for Information Resources Management. *Journal of Information Technologu Management*.

DeLone, W. H., & McLean, E. R. (1992). Infromation Systems Success: The Quest for the Dependent Variable . *Information Systems Research 3(1)*, 60-95.

Delone, W. H., & McLEan, E. R. (2002). Information Systems Success Revisited. *Proceedings of the 35th Hawaii International Conference on System Sciences* , 60-95.

Ghobakhloo, M., & Tang, S. H. (2015). Information system success among manufacturing SMEs: case of developing countries. *Information Technology for Development*, 573-600.

Gorla, N., Somers, T. M., & Wong, B. (2010). Organizational impact of system quality, information quality,and service quality. *Journal of Strategic Information Systems*, 207-228.

Kuppili, M. K., & Dr. Aryasri, A. R. (2012). Strategic Approach for successful Implementation of Management Infromation System for Manufactruing Industry. *International Journal Technology*.

Peniak, P. (2006). Implementation of Information Systems in Manufacturing Area. *Advances in ELectrical and Electronic Engineering*.

Petter, S., DeLone, W., & McLean, E. (2008). Measuring information systems success:models, dimensions, measures,and interrelationships. *European Journal of Information Systems*, 236-263.

Ronen , B., & Pass, S. (1992). Manufacturing Management Information Systems Require Simplification. *Industry Engineering*.

Samson, O. K. (2013). Management Information System impact on Profitability and Decision-making in selected Manufacturing Firm in Nigeria. *Greener Journal of Economic and Accountancy*, 030-043.

Appendix

Questionnaire – "Effectiveness of the Open Citrus Information System" (Users)

Purpose

This questionnaire asks for information about the "**Open citrus Information system**" that is currently used by CPBL Staff for production and delivery. We would like to measure the effectiveness the Open citrus system has on the overall performance of CPBL.

Please answer the questions in relation to your company. Your individual responses to the questionnaire will be strictly confidential.

Instructions

This is a survey, not a test; there are no right or wrong answers. Please print in the spaces provided and tick the boxes to mark your answers. Your Survey ID number will be provided.

1. Background Information	Answers:
Please enter your age:	
Please indicate the amount of computer experience you have in years:	
Please indicate the number of years you have been working for Citrus Products of Belize Ltd (CPBL):	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐ 8☐ 9☐ 10☐
Please indicate your gender:	Male ☐ Female ☐
Please indicate highest education level attained:	PhD ☐ Masters ☐ Bachelors ☐ Associates ☐ High School ☐ Primary School ☐
Which of the following best describes your position in this company?	Manager ☐ Forman/Supervisor ☐ Employee ☐

Indicate your agreement with each statement by rating it from (1) strongly disagree to (7) strongly agree.

2. Information quality	Disagree ---------- Agree
The Open Citrus system provides information that is exactly what you need	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
The Open Citrus system provides information you need at the right time	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
The Open Citrus system provide information that is relevant to your job	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
The Open Citrus system provides sufficient information	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
The Open Citrus system provides information that is easy to understand	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
The Open Citrus system provides up-to-date Information	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
At this time, the information provided by the Open Citrus system is contributing towards CPBL goals	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
Information provided by the Open Citrus system helps in solving problems concerning production and delivery	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
Overall Information quality provided by the Open Citrus is excellent	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
3. System quality	**Disagree ---------- Agree**
The Open Citrus system is easy to use	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
The Open Citrus system is user-friendly	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
The Open Citrus system provides high-speed information access.	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐
The Open Citrus system provides interactive features between users and system.	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

4. Complementary technology quality	Disagree ----------Agree
The software on the device (desktop computer, laptop, mobile device) used to access the Open Citrus system is adequate.	1☐ 2☐ 3☐ 4☐ 5☐ 6☐ 7☐

The device hardware (desktop computer, laptop, mobile device) used to access the Open Citrus is adequate.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
The device (desktop computer, laptop, mobile device) used to access the INFORMATION SYSTEM has an adequate internet connection in regards to speed and reliability.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐

5. *Computer Self-Efficacy*	**Disagree ----------Agree**
I COULD COMPLETE THE JOB USING THE INFORMATION SYSTEM:	
If there was no one around to tell me what to do as I go.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
If I had never used an information system like it before.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
If I had only the information system manuals for reference.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
If I had seen someone else using the information system before trying it myself.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
If I could call someone for help if I got stuck.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
If someone else had helped me get started.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
If l had a lot of time to complete the job for which the information system was provided.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
If I had just the built-in help facility for assistance.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
If someone showed me how to do it first.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
If I had used similar information systems before this one to do the same job.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐

Please answer the following questions using this scale:

Indicate the level of use with each statement by rating it from (1) Low to (7) High.

6. System Use	**Low ----------High**
The level of frequency use of the Open Citrus system	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
The level of dependence upon the Open Citrus system.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
The level to which I was able to complete a task using the Open Citrus even if there was no one around to tell me what to do as I go.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
The level of knowledge necessary to use the Open Citrus	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐

7. User Satisfaction	**Low ----------High**
The level of positive attitude or evaluation that users bring towards the Open Citrus system function.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
The level of perceived utility about the Open Citrus system	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
The level to which the Open Citrus has met your expectations.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
The level of satisfaction towards the Open Citrus system.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐

Please answer the following questions using this scale: (1) Very Poor to (7) Outstanding

8. Service Quality	**Very Poor ----------**
The support staff keep the Open Citrus system software up to date	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
When users have a problem, the Open Citrus system support staff show a sincere interest in solving it.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
The Open Citrus system support staff respond promptly when users have a problem.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
The Open Citrus support staff tell users exactly when services will be performed.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐

9. Perceived net benefits	**Very Poor ----------**
The Open Citrus system helps improve your job performance.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
The Open Citrus system helps the organization save cost.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
The Open Citrus system helps the organization achieve its goal.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
The Open Citrus improves the assessment and training	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
Using The Open Citrus in job increases my productivity.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐
Overall, using the Open Citrus enhances recruitment and performance management.	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐

Please return this survey to the individual that you obtain it from.

Thank you for your participation.