Evaluating the Crime Information Management System use by the Belize Police Department

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Abstract

The research will consist of major findings in regards to the efficiency and effectiveness of the Crime Information Management System (CIMS) implemented in the Belize Police Department throughout the country. Additionally, major techniques was adapted which were utilize by professionals around the globe to implemented and generate a questionnaire that incorporates numerous aspects of information to determine its efficiency and effectiveness to the entire Department and the overall performance of police in separate districts namely, Corozal, Cayo, and Belize.

Keywords: effectiveness, achievement, information quality, system quality, service quality, user's satisfaction, utilizes and perceived benefits.

Background Information

Management Information Systems (MIS) provides several benefits to the business organizations, which is a mean of effective and efficient coordination between Substations or Departments; access to relevant data and documents; it accessible for quick and dependable referencing; less human input and labour; improvement in organizational and departmental techniques; management of day-to-day activities and assistance in organization and departments; such as accounts, supply control, payroll, reports, files, etc.); MIS allows for a more closer contact with the rest of the world. It also provides a valuable time-saving benefit to the workforce. Employees do not need to collect data manually for filing and analysis. A substitute, that information can be entered quickly and easily into a computer program, as the amount of raw data grows becomes too large for employees to analyse and the system can easily generates a report or chart by the click of a button. In order to generate reports a business analyst will construct programs to access the data and information in response to queries by management. By having information at one's

finger tips the access to vital information managers will be better equipped to make decisions about procedures, future directions, and developments by competitors and the organization, and make an informative decision without hesitation. Life is changing daily due to technology so working in an information era, managers have to embrace masses of data, convert that data into information, formulate conclusions about that information and make decisions leading to the achievement of Department objectives and goals. For an organization, information is as vital resource equivalent to money, machinery and manpower. It is essential for the survival of the enterprise.

Introduction

Technology is evolving and making everything more uncomplicated to use. Management Information System has been boosted to simplify the performance of businesses to enable them to operate more effectively and efficiently. Furthermore, along with its proficiencies it generates more rapid decision making, refined designs which complements the benefit an objectives of the company. The Belize Police Department uses the Crime Information Management System (CIMS) to record and update any criminal activity in the country of Belize. All the substations or departments located in the country of Belize use the system to continually include daily report of criminal activities which occurs in their respective district so all the valid personnel can view and generate their reports if the needs arise to apprise the media of the Courts. The most essential part of the system is that any substation or department can view the data; police officers can include reports, but cannot edit or delete any data. Only a few in high authorities have the authority can edit any specific data. The purpose of the research is to examine whether the CIMS that is used by the police department is effective and efficient in conducting and reporting daily activities that happens in the separate districts of Belize. Additionally, it purposes is to ascertain whether the general public profit from this system as well as the department. Samples of 100 police were interviewed to generalize the whole range of users which are about 2000 police officers.

The research was conducted by four students of the University of Belize namely; Joshua Martinez, Arline Enriquez, Geneva Vanegas and Indera Flowers Grinage.

By doing the research it was clearly seen why some employees show resistance to the CIMS, while other cope with the use of it. In order to conduct this research, the Delone and Mclean Information System Success Model was modified and utilized to construct the instrument (questionnaire) which was distributed to police officers in Corozal, Cayo and Belize District.

Methodology of Use

A Questionnaire was used as the research instrument. Here are some lists of information gather together that will measure how effective the Crime Information Management System is.

- System Quality
- Service Quality
- Information Quality
- User Contentment
- Computer Self-Efficacy Measure
- Perceived Net Benefits
- Complementary Technology Quality
- Use

This questionnaire also collects information about the user's background.

- Gender
- Age
- District
- Work experience
- Level of education

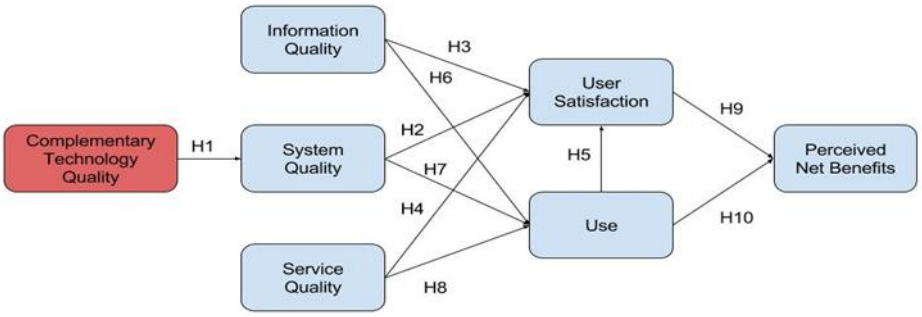
With the purpose of assessing the theory of technology quality, the use of a scale that was developed by Teece (1988) was necessary. A seven scale-item well-known from Baily and Person (1983) was used to evaluate the quality of information, as it is highly recognized and standard instrument in the CIMS field.

System quality was measured by a four-item scale that was formerly adapted by Alshibly (2011). The five item scale, however, was adapted to measure service

quality. The use of information system was measured with a four-item scale measure, which was also utilized in prior studies (Balaban et.al, 2013' Rai et.al, 2002).

User satisfaction was measured with a four-item scale created by Seddon and Yip (1992). To assess perceived benefits, a six-item scale adapted from (Alshibly 2011; Tansley et.al.2001) was utilized. Computer self-efficiency, on the other hand, was weighed using a seven-point liker scale ranging from 7 (agree) to 1 (disagree).

Figure 1



Hypothesis

H1. System quality will definitely persuade user satisfaction

H2. Information quality will definitely influence user satisfaction

H3. Service quality will definitely influence user satisfaction

H4. Use will surely influence user satisfaction

H5. System service will definitely influence user satisfaction

H6. Service quality will surely influence use

H7. Use will surely influence perceived net benefit

H8. Use will surely influence perceived net benefit

Literature review

With the growing speed of technology in the world many organizations, institutions, companies, and government entities seek ways to keep up to equivalence of the growing technology. By facilitating the use of technology the business communities has being collecting, organizing, storing and sharing information as the need arise for personal gain and the general public. Most or all business and people is transforming in the use of the Management Information System (MIS), it is the study of balancing networks use to collect, process, create and distribute data (Laudon & Laudon, 2012). The business performances in developing the Management information systems use analyses and mappings for the business structure and processes. It is to create an efficient system that will promote accurate and effective course of information. The business experts could only view the processes from their professional background and personal perspective on the other hand the clients, may have the capacity and vision to grasp the real world requirements necessary for the management information system progress (Chen H. 2002).

i. Availability of studies in Information Systems

The research for the management information systems becomes extensively as the research was progressing. The research provided in-depth information of the Crime Information Management System models being used and those data that have been used as the foundation of this research. It is a large amount of research of articles and papers that was available to choose from for this literature review. The main source used was Ebscohost that is an academic platform that provides different research papers. These research papers are from a variety of researchers from all

over the world; which explore the execution, achievement and future of the management information systems in its regions that extend to the rest of the world.

ii. Relationship among these Studies

From research done by Delone and McLean an incorporated model of Management Information System was triumph and the technology organization environment provide a small and medium enterprise with the relative importance and knowledge of the system success (2003). The successes of implementing the management information system were evaluated through different measures and prove to enable performance improvement as stated by Ghibakhloo and Tang. There were another tributary of research of the information system that follows the categorization of the management information system was successful according to Delone and Mclean (Sheddon, P. B.1997).

Further studies focus on accessing the success and the improvement of the MIS in the organization among employees. Teaching them the basics of the system model; so the human resource department can have a more effective business structure (Kato Y, 2008). It was also presented on how the MIS would aid the police department to be more effective in solving crimes and capturing criminals by means of the Geographic Information System (GIS). The GIS show various research examines and agree how necessary and useful the system is to achieve the goals of an institution or organization as stated by Maguire R. Edward (2010).

In an article named "Predictive Crime Mapping" conducted by J. Fitterer and one about a seminar conducted by the Executive Director of the International Association of Assessing Officers (IAAO) and Urban and Regional Information System Association (URISA) shows how managing the implementation and the success of the GIS in the police department would aids in the decrease of crime. Both the IAAO

and URISA seminar provided "A thorough overview concept, functions, applications, technologies, trends, problems and solutions associated with GIS" (2002). On another note research by J Fitterer would summarise and compare trends in crime activities at different places and to predict future crimes by aiding the police in their daily patrols (2015).

Presently to minimize crime rates the police departments are using a Crime Information Management System to improve their job environment by facilitation of collection, storing, and interpretation of data for future decision making. Similarly the geographical information systems (GIS) is being used by many police officers to reduce crime rate being it's a main tool for intelligence-led (Fitterer, Nelson, and Nathoo, 2015). Furthermore, where data, analysis and criminal theory are used for allocation and decision making is a growing system for growth and to guide police officers (Li, E. Y., (1997). Within a geographical context showing where crime occurs includes space and time, information to support intelligence-led police are increasingly map base and assistance from platforms that allows integration with the GIS. There are regions already using the spatial prediction to help police reduce crimes; example the Los Angeles police department has used spatial predictions of crime to estimate that geographical crime rates to decrease and pre-emptively allocate patrol units in various areas.

iii. Differences

Different research has shown the utilization of the information systems in the various police department. Those are precise to the site and surroundings that the information system is being used. It has identified the benefits of utilizing the information systems in the police department that entail the system can record data, access and analyse data from citizens which uses 'hot spot' or even predict crime in certain geographic location (Maguire R. Edward and Archbold Carol (2017). Moreover, many huge police departments today have made vast improvements in their capability to collect and store big amounts of data, yet many have made little progress in using the data collected as stated by Doll WJ, Torkzadeh G (1988). An

important challenge for police departments globally is the ability to use data for improving operations and management.

In the police department in India, according to Manish Gupta et.al (2015) a study was conducted on the department stated that the police department constructed a Crime Criminal Information System to stay abreast of criminal actions in the country. The police department uses the information system to address numerous problems they encounter in their country and to aid in the reduction of the crime rate. Before the information system was implemented they had to take into consideration the Indian police structure, responsibilities of the police in the department and the key changes and challenges the police will encounter due to high crime rate. Therefore, there was a great need for a support system that would highlight the roles and activities operated by the police department in India. As a result, studies shown that the information system was a success in the country as a means to combat criminal activities.

A document that was written by the National Institute of Justice, the New York police department uses the information system named Criminal Record Information and Management System (CRIMS). "The Criminal Record Information and Management System used by the department is a computerized case management computer program designed entirely for criminal trial courts. The CRIMS make available the position of any court criminal case and it is essential to resolve and for confirmation of a possible warrant" (2005). With the key advancements in computerized information management with respect to law enforcement and the perceived and actual benefits associated with them, it is concluded and cannot over emphasized that there is a need for a computerized policy for crime information management. CIMS increases the competence of the management of criminal records and acts as a foundation to decision making and improved trustworthiness of the law enforcement function.

iv. Gaps

Even though studies stated above show the usefulness of the MIS in the police departments and discover various issues in implementing the system in the department, there are a number of districts that the research did not cover. Firstly, in Belize none of the research was done to get feedback on the effectiveness of the CIMS that is used in the police department to record data on criminal activity and investigations. An additional gap in this research show; the duration of studies or the level of difficulty in learning the skills to administrate and use the CIMS effectively by the Police Departments, to achieve effectiveness in their profession. Even though researchers have comprehended the usefulness of Management Information System within an institution or organisation, a gap has been left that aims to explore the possible benefits. The MIS benefits to external stakeholders and if they observe and can prove that the institutions or organisations has indeed become more effective in their services and the benefits of the system model poses beneficial to the institution or organisation to its internally and external users.

v. How your study differs

The main function of the Crime Information Management System (CIMS) operated by the Belize Police Department is to manage and store data for comprehensive research and analysis. This is to provide key factors within the department along with significant information via its extra capabilities. The focus of this study will be to evaluate the effectiveness of CIMS in the Belize Police Department and to vet the extent the Police Officers use it or rely on it to complete daily tasks.

Analysis

Three main districts of Belize the survey was conducted namely; Corozal, Cayo, and Belize. One hundred police officers of the entire population of two thousand was our targeted population. One hundred questionnaires were dispersed distinctly to all three districts. The three districts are shown in table 1 as to where the survey was carried out, as well as the frequency of participants and pie chart 1 respectively shows the percentage of the participants as well.

District

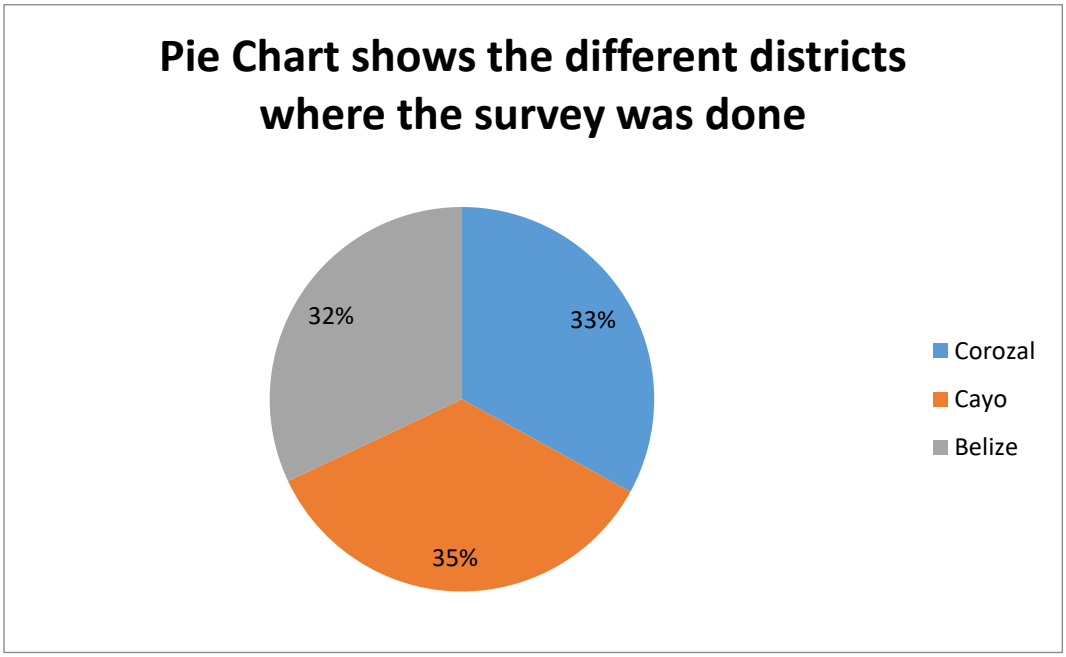
Valid	Frequency	Percent	Valid Percent	Cumulative Percent
Corozal	33	33.0	33.0	100.0
Cayo	35	35.0	35.0	67.0
Belize	32	32.0	32.0	32.0

Table 1

	Total	100	100.0	100.0	

Therefore, in Orange Walk District 33% or 33 questionnaires was distributed, in the Cayo District 35% or 35 questionnaires was distributed and in Belize District 32% or 32 questionnaires were distributed.

Pie chart 1



Additionally, the gender of each participant is illustrated in table 2, in the vicinity of Corozal the male and female participants are 17 out of 33 were male and 16 out of 33 were female that range closest in frequency. Similarly, in the vicinity of Cayo male were 23 out of 35 and female were 12 out of 35 who participants. Moreover, in the vicinity of Belize more males participated, 26 out of 32; than females was 6 out of 32.

Table 2

Gender of participants and corresponding district				
	District			
Gender	Corozal	Cayo	Belize	Active Margin
Male	17	23	26	66
Female	16	12	6	34
Active Margin	33	35	32	100

Age range of participants and gender					
	Age				
Gender	18-22	23-26	27-30	31 +	Active Margin

Table 3 illustrates the age range and the gender of participants.

Male	7	9	21	29	66
Female	8	12	10	4	34
Active Margin	15	21	31	33	100

Table 3

Ages and Level of Education of Respondents

In addition, from the 100 participants 15 are between the ages 18-22 years, 4 with primary school education, 7 having a high school diploma, whilst 4 have an associate degree. Furthermore, 21 participants are between the ages 23-26 years, 3 with a primary level education, 8 having a high school education, 9 have an associate's degree and 1 with a bachelor's degree. A total of 31 participants are between the ages 27-30 years, 3 with a primary school education, 11 having a high school diploma, and 16 have an associate's degree and 1 with a bachelor's degree. Whilst, 33 are of ages 31 plus years, 7 with a primary school education, 11 having a

high diploma, 11 have an associate's degree, 3 with a bachelor's degree and 2 individual have a master's degree. *Bar graph 1* illustrates the summary of the ages and level of education of all the hundred participants.

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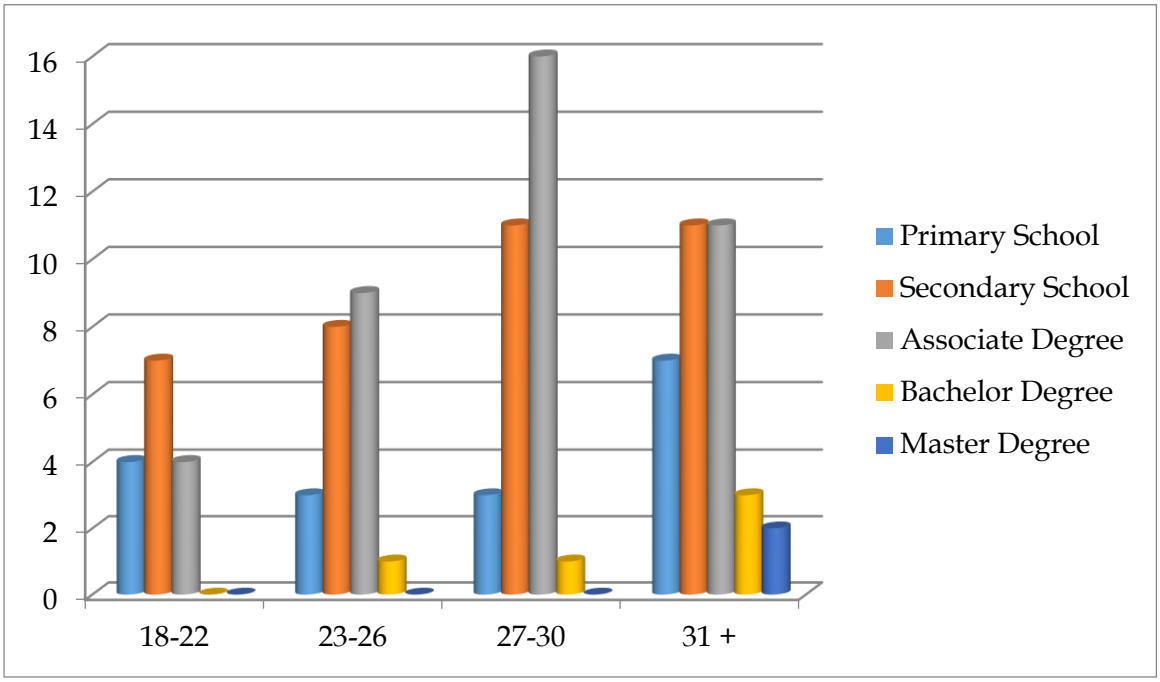
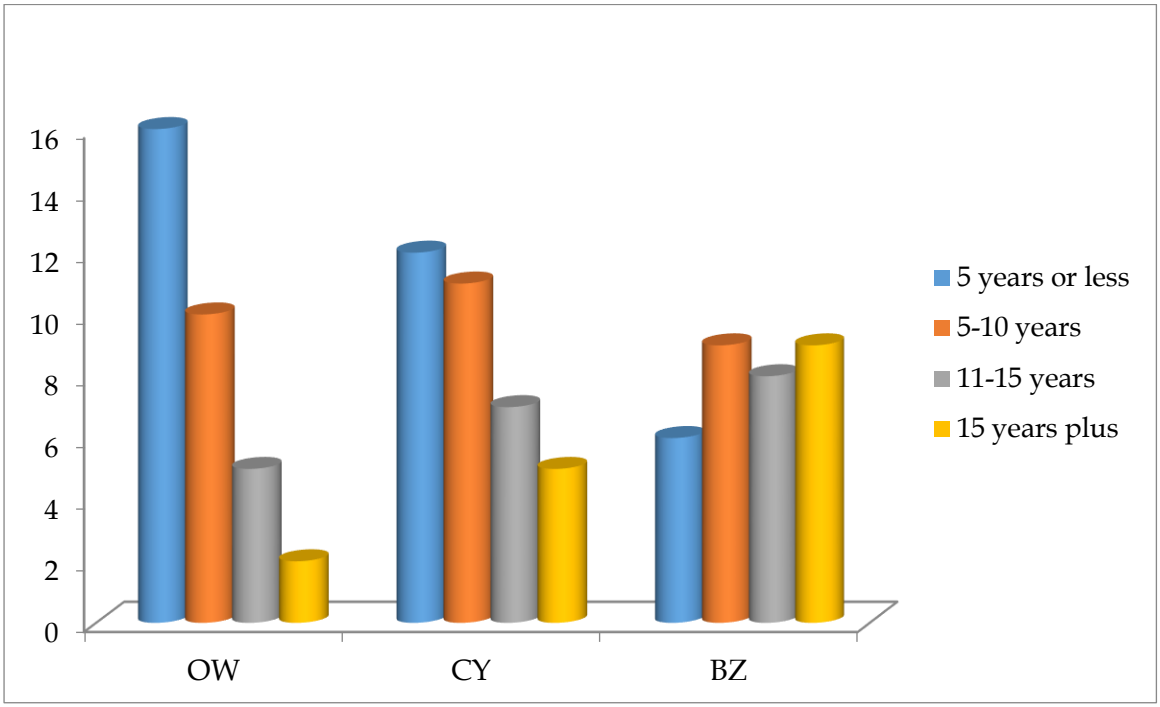


Work Experience

From Orange Walk District, out of the 33 participants, 16 have less than 5 years' work experience, 10 have between 5-10 years' work experience, 5 have between 11-15 years' work experience and only 2 individuals have more than 15 years' work experience. For the Cayo District, are 35 participants with 12 have less than 5 years' work experience, 11 have between 5-10 years' work experience, 7 have about 11-15 years' work experience and 5 have more than 15 years' work experience. While in Belize District 32 of participants whereby 6 have less than 5 years' work experience, 9 have about 5 to 10 years work experience, 8 have between 11-15 years' work

experience and 9 have more than 15 years' work experience. *Bar graph 2* illustrates the number of participants in their respective district and their level of experience.

Bar graph 2 illustrates the summary of the ages and level of education of all the hundred participants



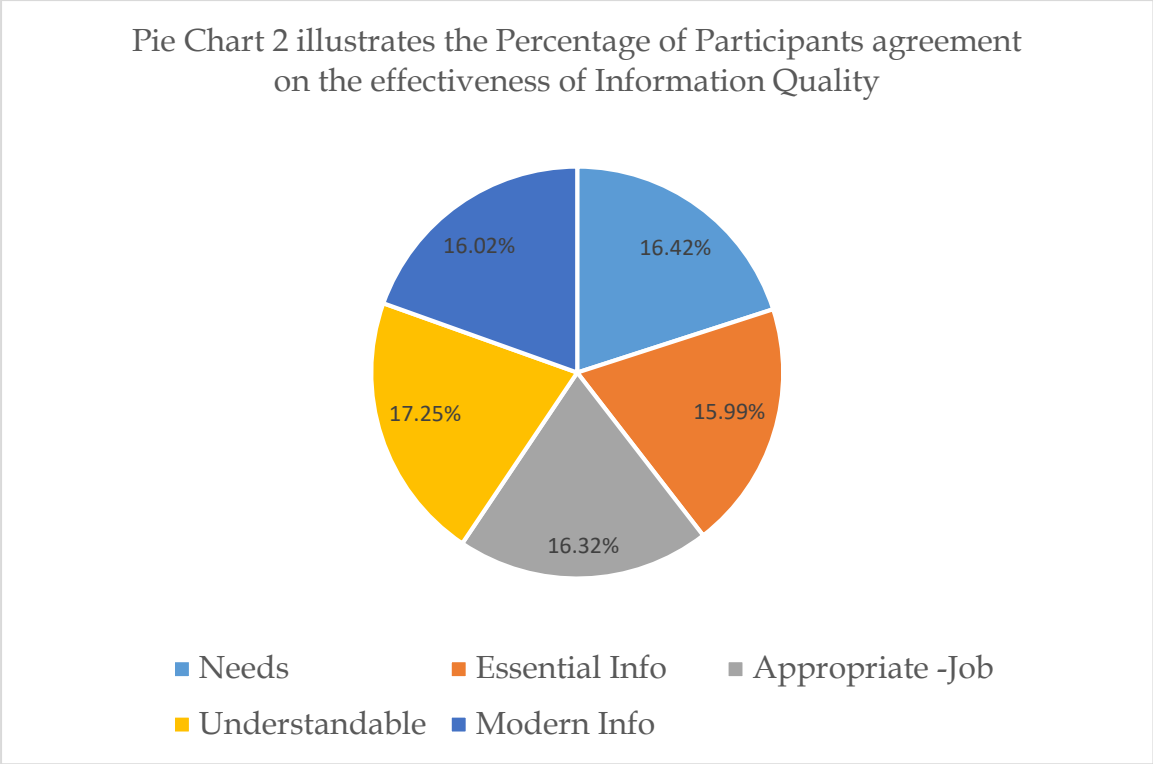
CIMS: Information Quality

The *pie chart 2* below shows the percentage of the participants in the three districts that strongly agree to the effectiveness of the information quality of CIMS. The data gathered showed that 16.42% of the participants strongly agree that the CIMS provides information that is needed. There are 15.99% of the participants strongly agreed that the CIMS provides essential information. 18.01% of the participants strongly agreed that the CIMS provides information that is appropriate for the job. 16.32% of the participants strongly agreed that the CIMS provided adequate information. Whilst 17.25% percent strongly agreed that the CIMS provided

information that is understandable. While 16.02% strongly agreed that the CIMS provided modern information.

After reviewing the figures, it shows that Information quality that CIMS provides is moderately low and need improvements. To both facilitate its use and improve performance with in the Belize Police Department.

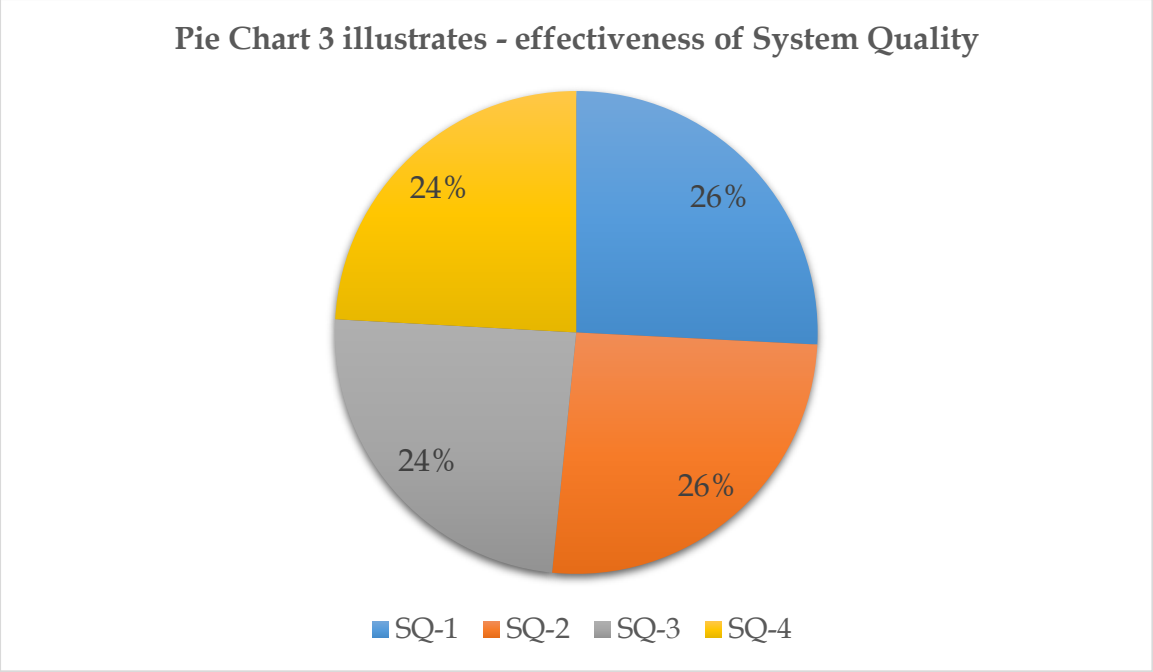
Pie Chart 2



CIMS: System Quality

Pie chart 3 explains the effectiveness of system quality that CIMS provides, 25.80% strongly agrees that the population of CIMS is easy to use and 25.80% strongly agrees that the CIMS is user-friendly. 24.27% agrees that CIMS provides high-speed information access, while 24.13% of CIMS strongly agrees the system provides interactive features between the system and the user.

Pie Chart 3

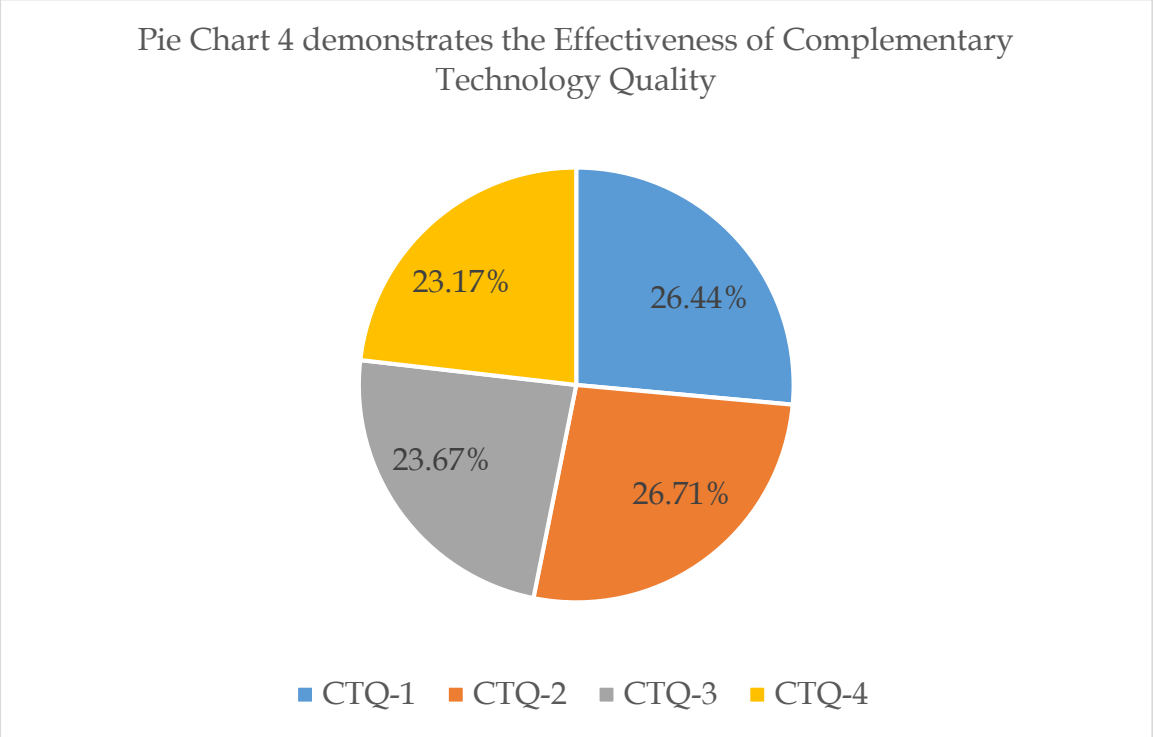


CIMS: Complementary Technology Quality

Pie chart 4 demonstrates that 26.44% - 26.71% percent of the respondent strongly agreed that the software on the device hardware (computer, laptop, mobile devices) access the CIMS system is adequate. 23.67% strongly agrees the speed of the internet connection is adequate and 23.17% strongly agrees the reliability of the internet connection used to access the CIMS system is adequate. It is evident that the internet connection that the police department use is not as adequate as it supposed to be

and therefore, must be upgraded to match the standards and the expectation of the system to function more effective and efficiently.

Pie Chart 4



CIMS Computer Self-Efficacy Measure

Pie chart 5 demonstrates that while many could complete the job, each have different views as to how they could complete the job using the CIMS system. Take for example, the respondents strongly agreed that using the CIMS system:

- 9.93% of them could complete the task if there was no one over seeing them,

- 9.23% of them could complete the task if they had never used it before,

- 9.38% of them could complete the task if they had the manuals for reference

- 9.48% of them could complete the task if they had seen someone use it before,

- 10.60% of them could complete the task if they could get assistant as the needs arise,

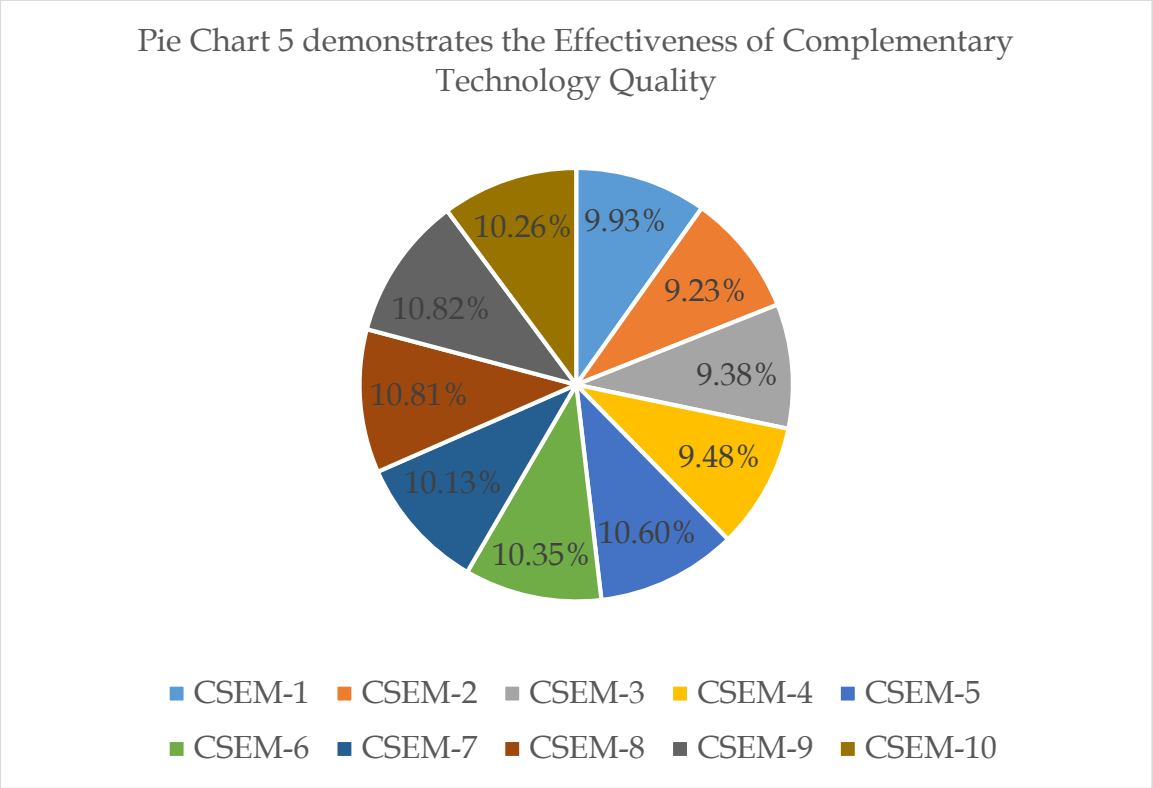
- 10.35% of them could complete the task if someone assist them at the beginning,

- 10.13% of them could complete the task if they had allotted time to complete the task for which was provided,

- 10.81% of them could complete the task if they only had the build-in help facility for assistance.

While, 10.82% of them could complete the task only if someone shows them how to use it first. Likewise, only 10.26% could complete the task if they had a similar system before the CIMS to do the same work.

Pie Chart 5



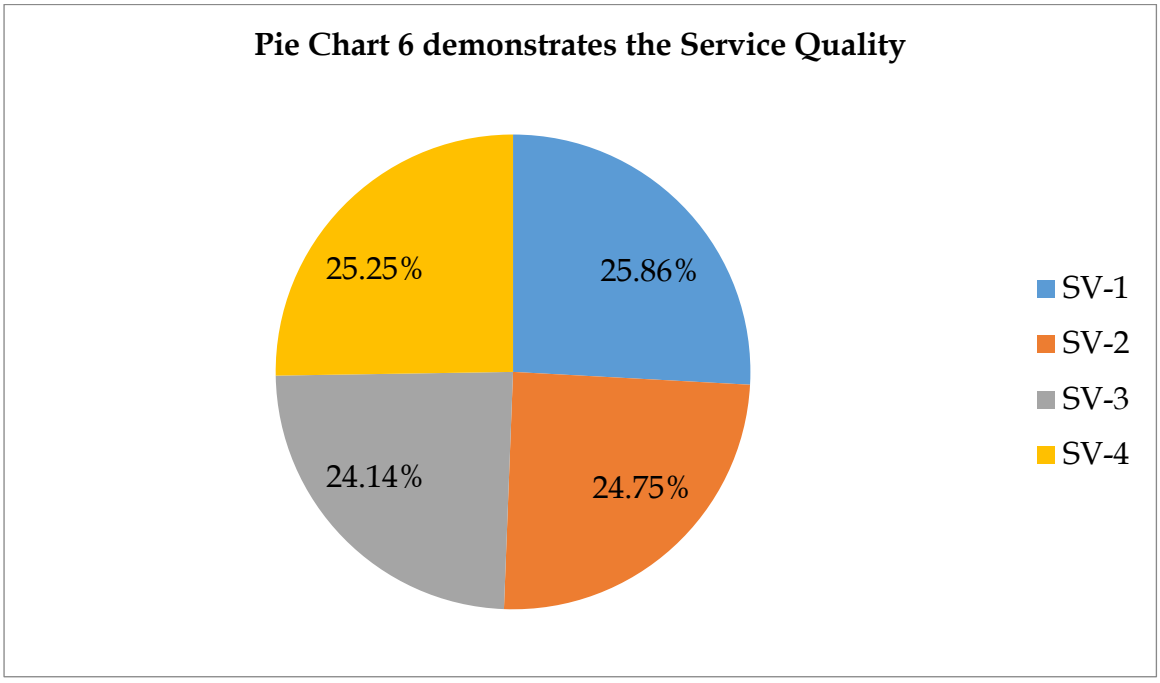
CIMS: Service Quality

Pie chart 6 illustrates the effectiveness of the CIMS service quality with the percentage of the respondents strongly agreeing as follow:

- 25.86% support staff keep the CIMS system software up to data,
- 24.75% states when users have issues with the system support staff show a since interest in resolving the issues.
- 24.14% state that support staff respond promptly when users have issues,

- 25.25% state that the support staff tell users exactly when services is performed. Overall, the service quality must be enhanced to well match the performance of the CIMS system to the users.

Pie Chart 6



CIMS: User Satisfaction

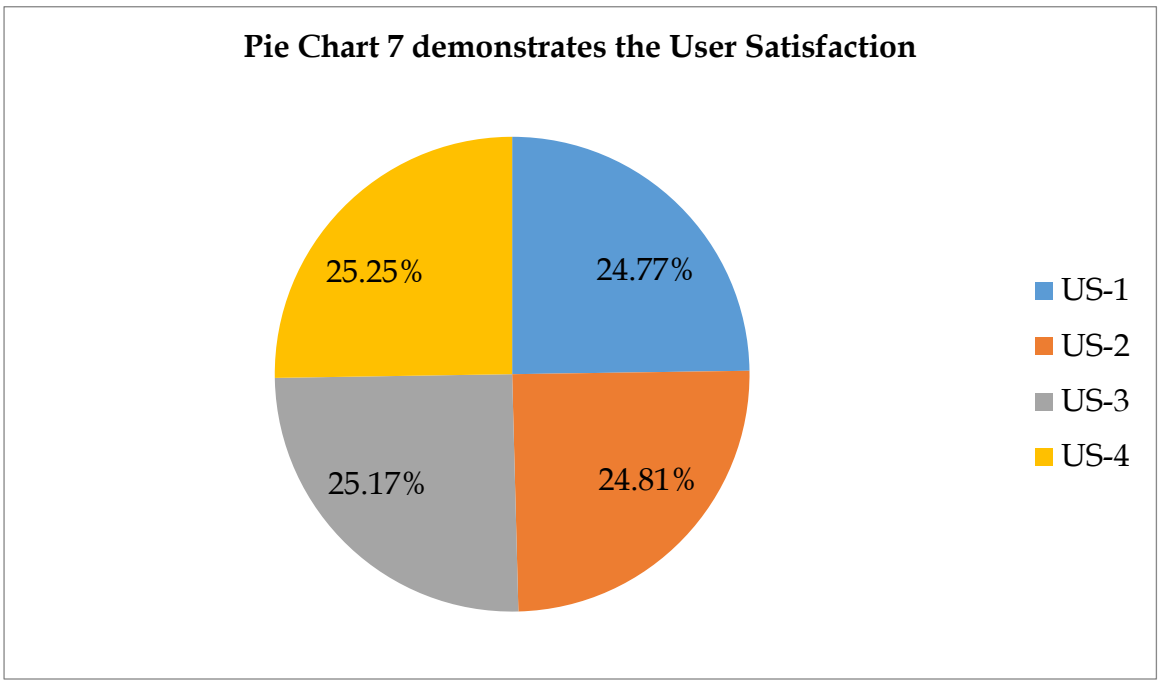
For the evaluation of user satisfaction, a scale of never-to-often was used. Four key questions were asked to determining the effectiveness of CIMS system to user satisfaction. Pie chart 7 illustrates the respondents' satisfaction as follows:

- 24.77% said that most of the users often bring a positive attitude or evaluation towards the CIMS system function.
- 24.81% think that the perceived utility about the CIMS system is high,

- 25.17% often believe that CIMS system has meet their expectations,
- Likewise, 25.25% are often satisfied with the CIMS system.

The overall user satisfaction is observable moderately low. Therefore, the CIMS system requirements are to create or increase its user's satisfaction.

Pie chart 7



CIMS: System Use

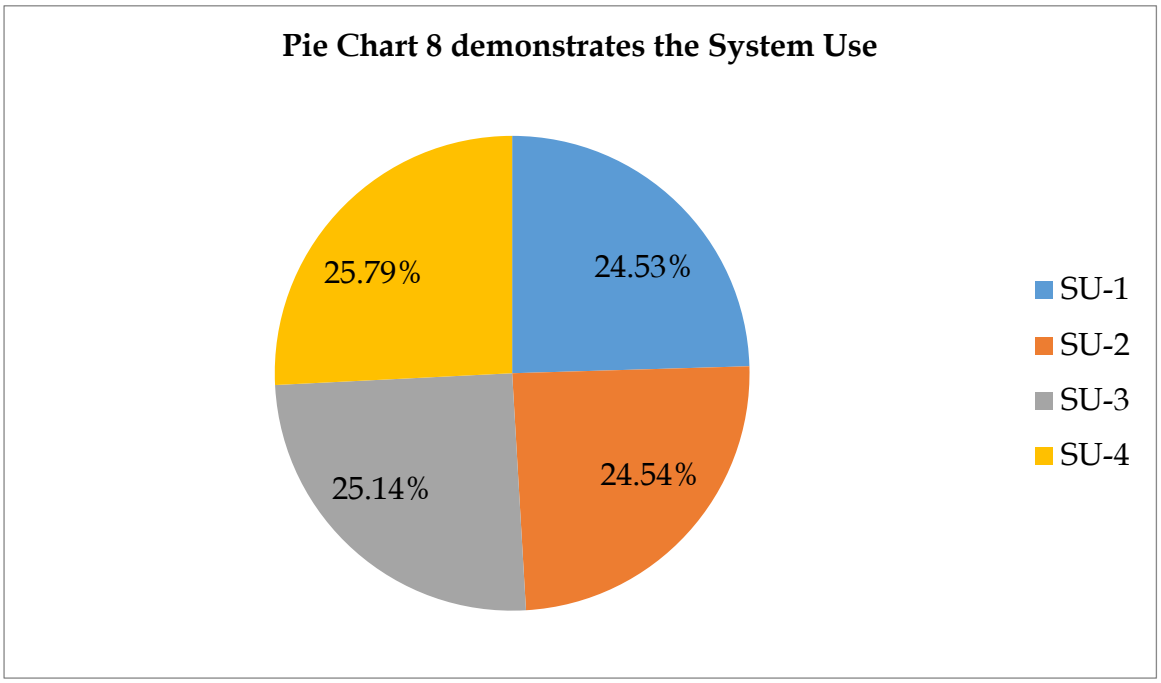
To illustrates the effectiveness of the CIMS system use the respondent believes are as follows:

- 24.53% believes that they depend upon the CIMS system,
- 24.54% believes they can complete their task using the CIMS system with or without help,

- 25.14% believe that the frequency of use with the CIMS sysem is often high
- 25.79% believe they have the knowledgeable enough to use the CIMS system

Pie chart 8 show the percentage of use for each questions.

Pie Chart 8



CIMS: System Perceived Net Benefit

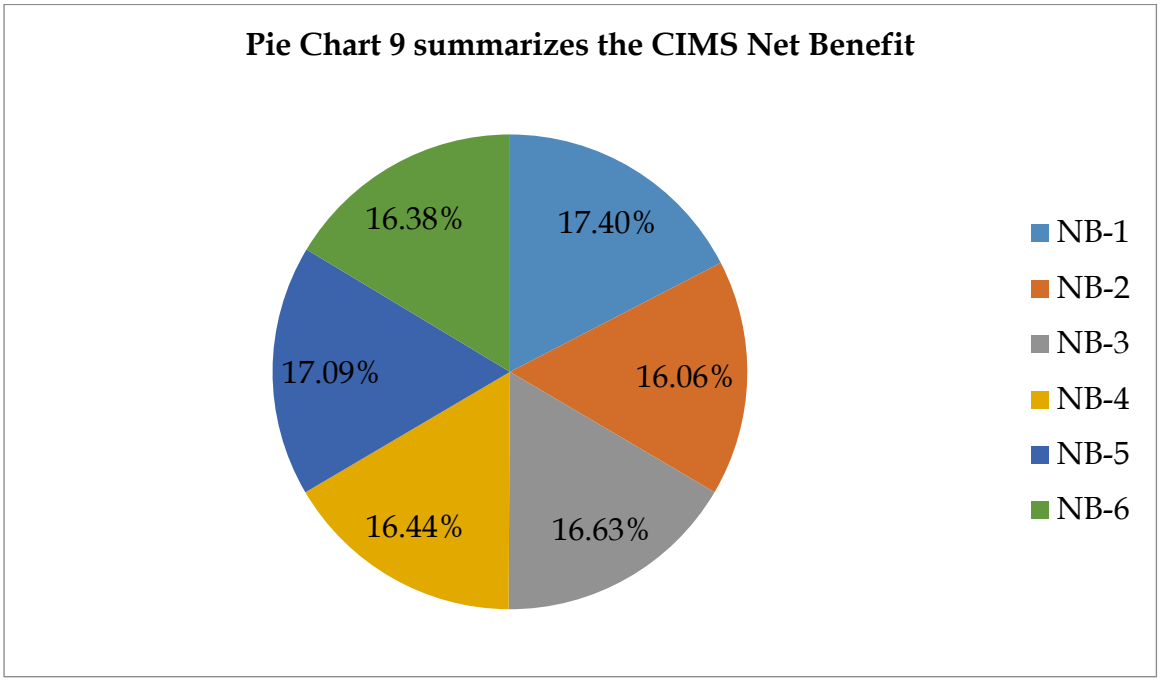
The CIMS system perceived net benefit was measures by means of six questions were ask to scale from never-to-often. The respondents' replies are as follows:

- 17.40% believes the CIMS aid with the improvement of their job performance,

- 16.06% believes the CIMS helps in cost,

- 16.63% believes that the CIMS aids with achieving the organization goals,
- 16.44% believes that productivity has increase in their job performance,
- 17.09% believes that using the CIMS often improves the assessment and training,
- 16.38% believes that recruitment and performance management is often helpful.

Pie chart 9 summarizes the perceived net benefit of CIM system.



Findings, Limitation, Responses to Hypothesis and Conclusion

1) Findings

i. One major issue that affects the effectiveness of the CIMS is the internet speed is very slow. Some police officers are unable to utilize CIMS due to its inability to work without internet.

ii. Many of the respondent disagreed that the CIMS is easy to use and not that user-friendly as it portrays.

iii. The results show that the software on the device and the device hardware used to access the CIMS is not adequate as it should be. A few percentages of police officers are able to satisfactorily use the CIMS and wide percentages are not satisfied.

iv. Looking at the service quality the majority of the respondent believes that the CIMS service quality is poor; the CIMS is not maintained consecutively, resulting in underperformance and officer developing a great and unprecedented negative attitude g towards the CIMS function.

v. The CIMS does not assist the police department in save cost; due to high cost in maintain the information system and purchasing of devices that the Government cannot meet such demand.

2) Recommendations:

A. Firstly, the internet speed must be enhanced which will enable all users to adequately access the CIMS form wherever.

B. The CIMS must be designed to be more user-friendly.

C. The devices utilized to access the CIMS should be maintained efficiently and regularly.

D. The service quality need drastic improved to obtain a high level of user satisfaction.

E. CIMS must be intended to aid the organization or department in saving cost and not generating more unneeded expense.

F. Training on how to operate the system is needed in the police department country wide, they are also a need to ensure that constant follow-ups and inspections on user performance.

G. Inclusively, the system need to be updated accordingly, also ensuring the implementation of new laws and regulations needs to be done so that it will encourage users to use the system.

3) Limitations

There were three significant limitations associated with carrying out this research, all due to time constraints.

- The first limitation has to do with the method that was used to conduct the data analysis. Due to the fact that there was not enough time to survey a larger number of police officers which caused us to concentrate on only a portion of the country and not the entire country. The analysis of the data was done by utilizing research methodology to draw a conclusion.
- Secondly, the sample utilize for the study only included one-hundred Police Officers and consequently is not representative of the total population of officers.
- Thirdly, we struggled to analyse the data from the questionnaires, the SPSS was utilize to analyse the data but we also had to do additional research.

4) Responses to Hypothesis

H1. System quality will definitely persuade user satisfaction

H2. Information quality will definitely influence user satisfaction

H3. Service quality will definitely influence user satisfaction

H4. Use will surely influence user satisfaction

H5. System service will definitely influence user satisfaction

H6. Service quality will surely influence use

H7. Use will surely influence perceived net benefit

H8. Use will surely influence perceived net benefit

- Information quality that was evaluated was considered to be insufficient, therefore negatively influencing user satisfaction.
- At least half of the population agreed that the CIMS is easy to use and user-friendly, therefore it positive influences user satisfaction.
- If CIMS service quality is high, then it will positively influence user satisfaction. Therefore, the CIMS service quality is not efficient leading to unsatisfied users.
- CIMS is not used constantly, therefore it creates unsatisfied users.
- Majority of users said that the CIMS is not easy to use and is not user-friendly; therefore it influences the use of the system.
- CIMS service quality negatively influences use.
- If users are or should get satisfied with the use of CIMS, then it will positively influence perceived net benefits. In this case, a large percentage of the users are not satisfied with the CIMS, therefore negatively affecting perceived net benefits.
- If the system is constantly used, then it positively impacts supposed net benefits, due to not utilizing the CIMS is not being used frequently, therefore negatively impacting perceived net benefit.

Conclusion

MIS affords numerous remunerations to the business organization: which is effective and efficient coordination between Departments and organization; ensuring quick and consistent referencing; access to pertinent data and documents; utilization less labour; shows a major improvement in organizational and departmental techniques; also ensure good management of day-to-day activities (as accounts, stock control, payroll, etc.); day-to-day assistance in a Department and closer contact with the rest of the world. MIS delivers a valued time-saving benefit to the workforce. The CIMS in the Belize police department is currently using needs to be updated with current programs that will ensure that all measure are taking into consideration and prove produce effective and efficient in carry out the daily activities of the different departments in Belize.

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