CIVIL REGISTRATION IN THE 21ST CENTURY: PROBING ICT SUSTAINABILITY

JANN BLAIR P. SALINAS
Administrative Officer I
Davao Oriental Provincial Statistical Office
Philippine Statistics Authority
jannblairsalinas@gmail.com | 09171039405

ABSTRACT

Pursuant to Republic Act 7160, Local Civil Registry Offices (LCROs) are created in each city or municipality to carry out the civil registration functions of the Local Government Unit (LGU). Civil registration is the system by which a government records the vital events of its citizens and residents.

Over the last few decades, organizations have shown increased interest in deploying information technology (I.T.) in office environments for they are being challenged with the changes brought by technological innovations. The Philippine Statistics Authority (PSA) started to embrace the changes brought by this innovation through the development of software programs for use by LCROs.

This study was mainly undertaken to determine the sustainability of implementing the above-mentioned I.T. resources developed by PSA and the factors affecting its implementation. Data were gathered using a semi-structured interview questionnaire. Follow-up interviews and observations were conducted to gather additional data to strengthen initial results. Data were analyzed both quantitatively and qualitatively.

Results revealed that BREQS and CRIS are currently being used by 64% of the LCROs in Davao Oriental while PhilCRIS is currently being used by 91% of the LCROs. Additionally, BREQS, CRIS and PhilCRIS are currently being used by LCROs for an average of 8.8, 14.0 and 2.9 years, respectively.

Using these systems, problems are being encountered including bugs/errors of the system and lack of trainings for the in-charge of the system implementation in the LCRO. Thus, updating of the system by PSA is necessary to fix these bugs. Trainings are also recommended to be undertaken.

In general, the implementation of BREQS, CRIS and PhilCRIS in the civil registry offices in Davao Oriental is sustainable considering the number of LCROs which are currently using these systems.

Keywords: *civil registration, information technology, usability, sustainability*

INTRODUCTION

The Local Civil Registry Office (LCRO) is created in each city or municipality pursuant to Republic Act (RA) 7160 otherwise known as the Local Government Code of the Philippines. Each LCRO is in-charge of carrying out the civil registration activities in every locality. Civil registration is defined as the continuous permanent, compulsory and universal recording of the occurrence and characteristics of vital events and other civil status pertaining to the population as provided by decree, law or regulation in accordance with the legal requirement of each country *(Hufana, 2010)*.

To oversee the implementation of civil registration in the country, the National Statistician of the Philippine Statistics Authority (PSA), in his/her capacity as the Civil Registrar General is hereby authorized, among others to issue all policies, instructions and standards on civil registration and exercise technological supervision over all civil registrars.

The 21st century has been regarded as the Information Age. The era when computers were invented and further being developed. People started to utilize its capacity to transform tedious jobs into simpler ones. Technological changes brought dramatic new options for individuals, businesses and organizations. Over the last few decades, organizations started to show increased interest in deploying information and communications technology (ICT) in office environments.

Like many others, government offices started to embrace the changes brought forth by the 21st century innovation. With the advent of information age and acknowledgement of the importance of keeping abreast with the latest technologies available, the Philippine Statistics Authority (PSA), with its Information Technology and Dissemination Division (ITDD) develops various information systems to be used and implemented by LCROs in their day-to-day transactions.

The Batch Request System (BREQS), Civil Registry Information System (CRIS) and its updated version, the Philippine Civil Registry Information System (PhilCRIS) are the three computer-based information system created for use by LCROs. These information systems are created by PSA to automate and fast track various transactions at LCROs especially in retrieving the vital records of an individual. Additionally, these would help in the easy generation of vital statistics for use by policy makers and program implementers.

The study was crafted to determine the status of LCROs in the province relative to its implementation of ICT resources. Specifically, the study evaluated and measured the sustainability of implementation by LCROs of the available ICT resources.

Results of this study would provide valid information for both the PSA and the Local Government Unit (LGU) to improve the civil registration programs of each LCRO. Findings can be used as a tool in assessing the need for a more comprehensive trainings and workshops on the use of available technological resources. Moreover, problems, errors and bugs would be properly documented to provide the PSA with benchmark data to improve its way of developing information systems and software which suits users' needs and requirements.

METHODOLOGY

The study was conducted using a quantitative-qualitative approach. It employed survey questionnaires, follow-up interviews and observations to gather necessary data. The Local Civil Registry Offices (LCRO) in Davao Oriental were the study domain. Each LCRO is headed by a City/Municipal Civil Registrar (C/MCR). The study was carried-out using complete enumeration due to limited or few numbers of respondents who can provide the

needed data. There are only sixty-two (62) identified respondents – eleven (11) civil registrars and fifty-one (51) staff/personnel. The civil registrars were the main respondents of the study and the LCRO staff/personnel were also interviewed using a separate set of questionnaires to determine the knowledge and skills they possess which would help in the implementation of these technological resources.

The sustainability of implementing BREQS, CRIS and PhilCRIS was determined using identified indicators such as (1) current utilization of the system, (2) usability of the system or its ease of use, (3) allocation of funds for maintenance and support of technology, (4) attendance to refresher courses and trainings. These indicators are the determining factors of sustaining the implementation of the above-stated I.T. resources.

Presence of Indicators	Description
at most 4	Very sustainable
1st indicator and at least 2 others	Moderately sustainable
1st indicator and at least 1 other	Sustainable
absence of 1st indicator	Not sustainable

The first indicator was given higher weight because the absence of it signals the non-sustainability of the implementation. Using the rubric, the level of sustainability was categorized as "very sustainable" if all of the indicators are present; "moderately sustainable" if the first indicator is present together with at least two (2) other indicators; "sustainable" if the first indicator is present together with at least one (1) other indicator; and "not sustainable" if the first indicator is not satisfied even if other indicators are present.

RESULTS AND DISCUSSION

In the context of this study, sustainability refers to the longevity and continuity of using available information technology resources developed by PSA such as BREQS, CRIS and PhilCRIS after unforeseen events (hardware and software malfunction) had occurred.

a. *Current utilization of the software*

When utilization or usage of the software is concerned, the BREQS and CRIS are currently being used by sixty four percent (64%) or seven (7) out of eleven (11) LCROs in Davao Oriental while PhilCRIS is currently being used by ninety-one (91%) or ten (10) out of eleven (11) LCROs province-wide.

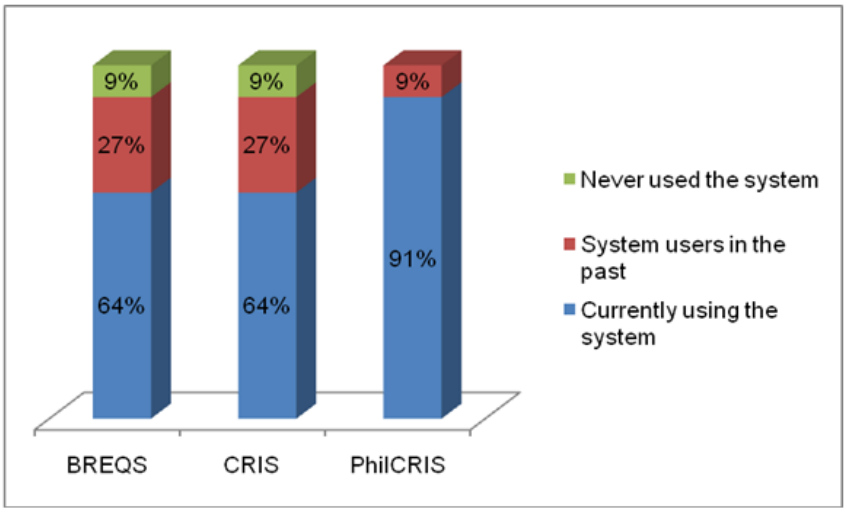

Figure 1 Percentage distribution of software utilization by LCROs

Moreover, BREQS and CRIS were used in the past by twenty-seven (27%) or four (4) out of eleven (11) LCROs. Only one (1) LCRO never used the BREQS and CRIS software. One (1) LCRO have used the PhilCRIS software in the past.

Current users of BREQS are LCROs of Boston, Cateel, Governor Generoso, Lupon, Manay, City of Mati and San Isidro. Users of BREQS in the past were LCROS of LCROs of Baganga, Banaybanay and Caraga. LCRO Tarragona never used the BREQS software.

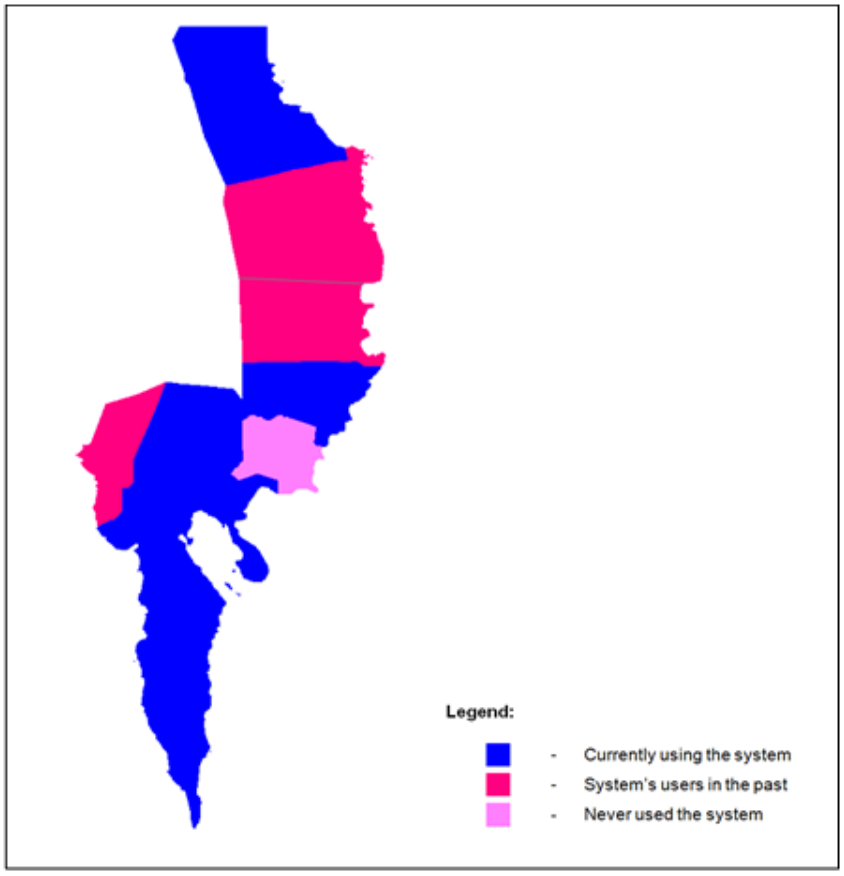

Figure 2 Distribution of BREQS implementation in Davao Oriental

Moreover, the CRIS software is currently used LCROs of Baganga, Boston, Caraga, Cateel, Governor Generoso, Lupon, and City of Mati. Previous users include LCROs of Banaybanay, Manay and San Isidro. LCRO Tarragona never used the CRIS software in their daily operation.

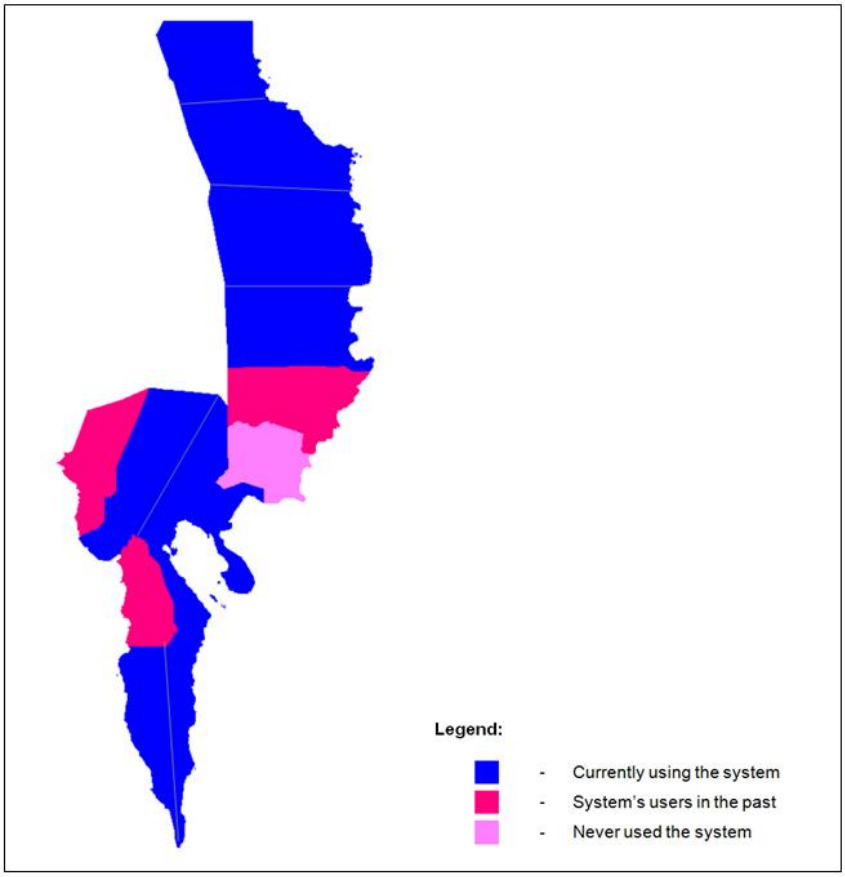

Figure 3 Distribution of CRIS implementation in Davao Oriental

PhilCRIS is currently used by LCROs of Baganga, Boston, Caraga, Cateel, Governor Generoso, Lupon, Manay, City of Mati, San Isidro and Tarragona. LCRO Banaybanay has used the software in the past.

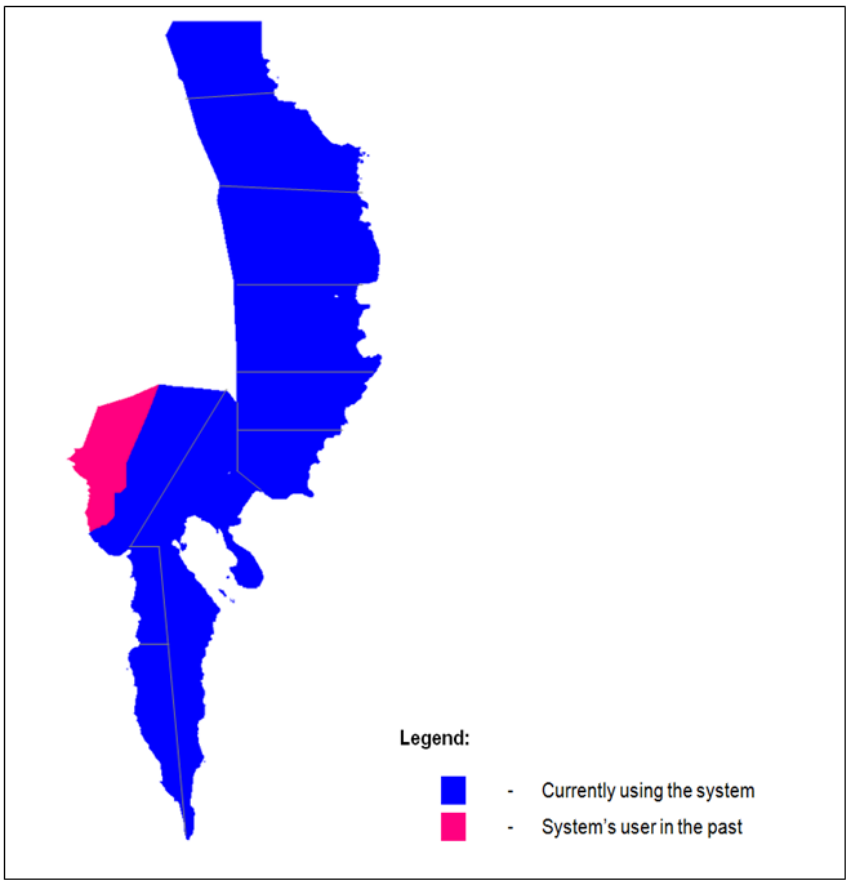

Figure 4 Distribution of PhilCRIS implementation in Davao Oriental

Data further revealed that the average number of years of implementing BREQS in their locality for those LCROs which are currently using BREQS was 8.8 years. LCRO Lupon had the highest number of years of implementing BREQS which is 11.0 years while LCRO Manay is the lowest with 6.0 years.

Table 1 Current users of BREQS by number of years of implementation

LCRO	No. of Years of Implementation
Boston	8.5
Cateel	9.0
Governor Generoso	9.7
Lupon	11.0
Manay	6.0
City of Mati	8.9
San Isidro	10.0

For users of the system in the past, LCRO Baganga had the highest number of years of implementing BREQS which is 6 years while LCRO Banaybanay is the lowest with only 1 year. The average number of years of implementing the BREQS in their locality for those who have used the BREQS software in the past was 3 years.

Table 2 Past users of BREQS by number of years of implementation

LCRO	No. of Years of Implementation
Baganga	6.0
Banaybanay	1.0
Caraga	2.0

For LCRO Tarragona which never used the BREQS software, according to the civil registrar, the main reason for not using it was due to the "unavailability of computer units and other ICT equipment" necessary for the full implementation of the system. The concerned civil registrar stressed out that "although funds became available, the process of utilizing the same is tedious and hassle". Also, the civil registrar seems to be contented with the current system of their office for the meantime.

Further, data revealed that all the three LCROs stopped using BREQS software because the computer which was used for their BREQS operation was "damaged or bugged down due to virus attacks…" and that there was a "…software or hardware malfunction". Another reason why they stopped using BREQS was due of insufficiency of funds to repair damaged computers. Further, one of the three civil registrars believe that "the software requires higher maintenance and its demands are high but their office lacks budget…" for the purpose. Another civil registrar considers the "distance from their municipality to the city where the computer can be repaired and fixed" as the main reason why they stopped using it.

Table 3 Distribution of reasons why LCROs stopped using BREQS

LCROs	R1	R2	R3	R4	R5	R6	R7
Baganga	×	×	×	✓	✓	×	✓
Banaybanay	×	×	×	✓	✓	✓	×
Caraga	×	×	×	✓	✓	×	✓

Legend:
R1 = knowledgeable staff went out of job
R2 = difficult user interface
R3 = complex software operation
R4 = computer bugged down due to virus attack
R5 = software or hardware malfunction
R6 = insufficient funds to repair damaged computers
R7 = others

Reasons	Frequency	Rank
R4	3	1
R5	3	1
R6	1	3
R7	2	2

The average number of years of implementing the CRIS in their locality for those who are currently using CRIS was 14.0 years. Table 4 shows the number of years of implementing CRIS software by LCROs that are currently using the software. The data revealed that among the seven (7) LCROs that are currently using the CRIS software, LCRO Baganga had the highest number of years which is 16.0 years. LCRO Caraga is the lowest with 12.0 years.

Table 4 Current users of CRIS by number of years of implementation

LCRO	No. of Years of Implementation
Baganga	16.0
Boston	14.0
Caraga	12.0
Cateel	14.0
Governor Generoso	13.4
Lupon	14.0
City of Mati	14.3

Meanwhile, of the three (3) LCROs that have used the software in the past, LCRO San Isidro had the highest number of years of implementing CRIS which is 6.0 years. LCRO Banaybanay is the lowest with 3.0 years. *See Table 5.* The average number of years of implementing the CRIS in their locality for those who have used the CRIS software in the past was 4.3 years.

Table 5 Past users of CRIS by number of years of implementation

LCRO	No. of Years of Implementation
Banaybanay	3.0
Manay	4.0
San Isidro	6.0

"Unavailability of computer units and other ICT equipment" was the main reason why LCRO Tarragona never used the CRIS software. Computers equipment is necessary for the full implementation of the system; hence, its absence equates to the inability of concerned LCRO to implement this IT resource. For the civil registrar of the LCRO concerned, "although funds are available now, the process of utilizing the same is tedious and hassle". The civil registrar also seems to be contented with the current system of their office for the meantime saying that they "can still deliver the services" which the clients needed.

Additional investigation revealed that all the three LCROs stopped using CRIS software because the computer which was used for their CRIS operation was "damaged or bugged down due to virus attacks…" and that there was a "…software or hardware malfunction".

Table 6 Distribution of reasons why LCROs stopped using CRIS

LCROS	R1	R2	R3	R4	R5	R6	R7
Baganga	×	×	×	✓	✓	×	×
Banaybanay	×	×	×	✓	✓	×	×
Caraga	×	×	×	✓	✓	×	×

Legend: R1 = knowledgeable staff went out of job
R2 = difficult user interface
R3 = complex sofwtare operation
R4 = computer bugged down due to virus attack
R5 = software or hardware malfunction
R6 = insufficient funds to repair damaged computers
R7 = others

Reasons	Frequency	Rank
R4	3	1
R5	3	1

Table 7 shows the number of years of implementing PhilCRIS software by LCROs that are currently using the software. Data revealed that among the ten (10) LCROs that are currently using the PhilCRIS software, LCRO Governor Generoso had the highest number of years which is 4.0 years. LCRO Caraga is the lowest with 1.0 year. The average number of years of implementing the PhilCRIS in their locality for those who are currently using PhilCRIS was 2.9 years.

Table 7 Current users of PhilCRIS by number of years of implementation

LCRO	No. of Years of Implementation
Baganga	4.0
Boston	2.9
Caraga	1.0
Cateel	2.0
Governor Generoso	4.3
Lupon	4.0
Manay	2.0
City of Mati	3.0
San Isidro	3.0
Tarragona	3.0

Meanwhile, LCRO Banaybanay is the only civil registry office that had used PhilCRIS software in the past. LCRO Banaybanay had used the software for 1.0 year. Additional investigation revealed that LCRO Banaybanay stopped using PhilCRIS software because the computer which was used for their PhilCRIS operation was "damaged or bugged down due to virus attacks…" and that there was a "…software or hardware malfunction". Another reason why they stopped using the system was due of "insufficiency of funds to repair damaged computers".

b. *Usability of the systems*

Of the forty nine (49) LCRO staff/personnel who are computer literate, twenty nine percent (29%), thirty seven percent (37%) and forty one percent (41%) are incharge of BREQS, CRIS and PhilCRIS software operation in the LCROs, respectively. The remaining percentages are not in-charge of the software operation. This implies that at least one person is using or is responsible for BREQS and CRIS operation while at least two (2) personnel is responsible in operating the PhilCRIS software. This further shows that the civil registrar has assigned a staff to man the computer with the installed software and is responsible in manipulating and using the system.

All BREQS, CRIS and PhilCRIS in-charge in each LCRO were asked if the system was usable. Nielsen (2012) defined "usability as a quality attribute, that assesses how easy user interfaces are to use". Data revealed that all systems' in-charge answered "Yes", which means that the system is usable. "When system's design is concerned, usability is a necessary condition for survival" of the system and one of the reasons why users continue to use a system or software.

Interviews with the civil registrar revealed that the use of BREQS, CRIS and PhilCRIS, "brought LCRO transaction into a new level" of serving its clients. Clients were "served faster" and are therefore satisfied with the services of the LCRO. "Processing of transactions became easier and the time of processing was lessened". The civil registrars also believed that in using the system, "the workflow of transactions is streamlined". According to Markgraf (n.d.), information systems gain

their importance by processing the data from organization's inputs to generate information that is useful for managing their operations. Moreover, "information systems offer more complete and more recent information, allowing managers to operate their organizations more efficiently."

However, the implementation of any system or software has its own setbacks and problems. In-charge of the software operation was asked if they encountered any problem or error in using the systems. Data revealed that forty three percent (43%), thirty nine percent (39%) and fifty percent (50%) of the in-charge have encountered errors or problems in BREQS, CRIS and PhilCRIS, respectively. Although the number of staff/personnel who are saying that they encountered error lower or just equal than those who did not encounter any error, this figure is still noteworthy of PSA's attention since errors affect the ability of the system to produce accurate results. Software packages "would require some maintenance work in order to continue working as efficiently as possible". Performing updates to systems will deliver a multitude of revisions… such as adding new features, removing outdated features, updating drivers, delivering bug fixes, and most importantly, fixing security holes that have been discovered *(Kovacs, 2014).* Hence, updates which fix these errors are necessary.

Errors and system bugs affect how the system processes data being entered and how it outputs accurate outcomes. Comprehensive and proper documentation helps fix the problem. Interview with BREQS in-charge revealed that the software is "out modeled" and that the "software has not been updated" since the beginning of its implementation. Further, BREQS software is "not compatible with the latest operating systems" available such as Windows 8 or 10. Leonard and Klutho (1989) defined upward compatibility as a "feature of a new hardware or software that enables it to work with the newer or more powerful versions of the same and, often, other hardware or software". Other respondents complained about "hardware problems, that is, hard disk crash…" resulting to inability to use the system. Meanwhile, a common bug that the users are complaining about the system was its inability to "erase or delete some encoded entries".

Like the BREQS, CRIS is also "out modeled" according to the in-charge. It has not been updated since the beginning of its implementation. It is also "not compatible with some printers available in the market". Other respondents complained about "hardware problems, that is, hard disk crash…" and that "files easily get corrupted…" "Some functionalities of the software are missing" which is a result of its "incompatibility with the latest operating systems" available such as Windows 7, 8 or 10.

PhilCRIS in-charge also revealed that the common error or problem they encountered in using PhilCRIS includes "offline entries" when printing, especially in printing Certificates of Death and Marriage. This means that some entries moved up or down (not on its proper places) when printed in the required forms. Further, one in-charge complained about the "files being easily corrupted".

Technical support is important because of potential complaints and problems which software users may encounter in the course of its operations. The civil registrars were asked if there are "available personnel from PSA which can be contacted for any error or problem in system's operation and implementation". Data revealed that all civil registrars answered "Yes". This implies that system support from the PSA is available for consultation by LCR offices in cases of software/system malfunction.

6.3 Allocation of funds for the support and maintenance of technology

Funds make it easy for an organization to improve its services. The occurrence of unexpected computer error and hard disk crash necessitates for the services of technician. It is also during these times that replacement parts and other peripherals are needed. Thus, fund source is required.

When civil registrars are asked if funds are available for the maintenance and support of technology, nine (9) out of eleven (11) civil registrars answered “Yes”, which means that funds are allocated for the “repair and purchase of replacement parts” for damaged computer hardware and peripherals. These are the civil registrars of Boston, Caraga, Cateel, Governor Generoso, Lupon, Manay, City of Mati and San Isidro. Civil registrars from LCRO Baganga, Banaybanay and Tarragona answered “No”.

6.4 Attendance to refresher courses and trainings

The civil registrars were asked if there were trainings or refresher course conducted by PSA in line with the implementation of the software and if there were personnel or staff from the LCRO who attended the same training, all civil registrars unanimously answered “Yes”. Refresher courses and trainings update the in-charge of the system implementation on the features and capabilities of the system.

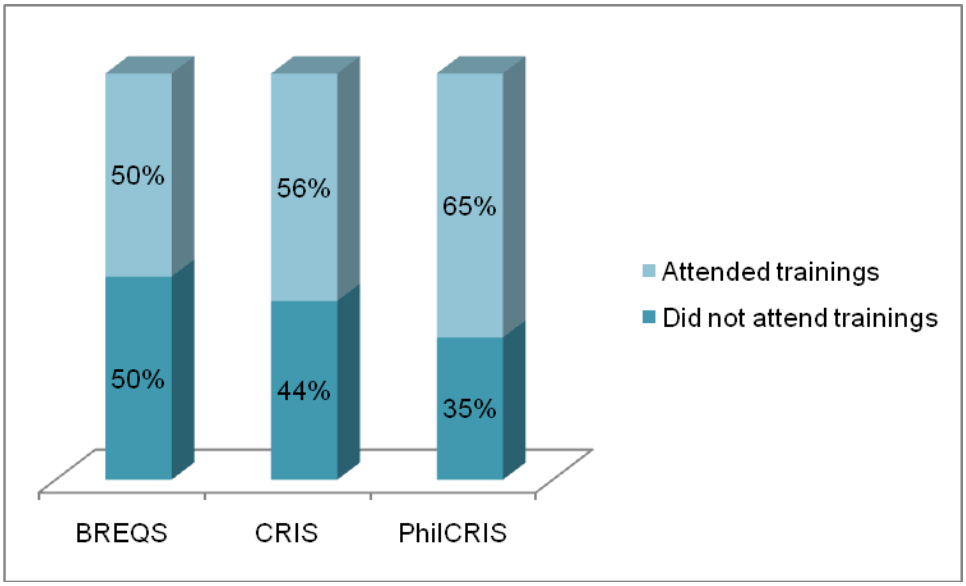

Figure 5 Percentage distribution of training attendance of software in-charge

Fifty percent (50%) of the BREQS in-charge, fifty six percent (56%) of the CRIS in-charge and sixty five percent (65%) of the PhilCRIS in-charge have attended formal trainings on how to use the system conducted by the then National Statistics Office (NSO), now Philippine Statistics Authority (PSA). In-charge of the software operation who did not attend any training learned how to use the system by “self-exploration”, “informal briefing by those who have attended the training” and “utilization of available manual”. This data implies the need for refresher course or training on software operation to update the in-charge on complexity of the system.

Sustainability of Implementing BREQS

Using the rubric, the implementation of BREQS is “very sustainable” in the LCROS of Boston, Cateel, Governor Generoso, Lupon, Manay, City of Mati and San Isidro. This means that all indicators were met by these LCROs.

Table 8 Distribution of LCROs implementation of BREQS by presence of indicators

LCRO	Presence of Indicators				Total	Description
	Ind. 1	Ind. 2	Ind. 3	Ind. 4		
Baganga	×	✓	✓	✓	3	Not sustainable
Banaybanay	×	✓	✓	✓	3	Not sustainable
Boston	✓	✓	✓	✓	4	Very sustainable
Caraga	×	✓	✓	✓	3	Not sustainable
Cateel	✓	✓	✓	✓	4	Very sustainable
Governor Generoso	✓	✓	✓	✓	4	Very sustainable
Lupon	✓	✓	✓	✓	4	Very sustainable
Manay	✓	✓	✓	✓	4	Very sustainable
City of Mati	✓	✓	✓	✓	4	Very sustainable
San Isidro	✓	✓	✓	✓	4	Very sustainable
Tarragona	×	✓	✓	✓	3	Not sustainable

LCRO Baganga, Banaybanay and Caraga were “not sustainable” in implementing BREQS because they have stopped using it in their daily operation. The implementation of BREQS in LCRO Tarragona on the other hand, is “not sustainable” because they never used the software.

Sustainability of Implementing CRIS

LCROs of Boston, Caraga, Cateel, Governor Generoso, Lupon, City of Mati have a “very sustainable” implementation of CRIS software. The four indicators were met by these LCROs. LCRO Baganga has a “sustainable” implementation of CRIS because only three indicators were met.

Table 9 Distribution of LCROs implementation of CRIS by presence of indicators

LCRO	Presence of Indicators				Total	Description
	Ind. 1	Ind. 2	Ind. 3	Ind. 4		
Baganga	✓	✓	×	✓	3	Sustainable
Banaybanay	×	✓	×	✓	2	Not sustainable
Boston	✓	✓	✓	✓	4	Very sustainable
Caraga	✓	✓	✓	✓	4	Very sustainable
Cateel	✓	✓	✓	✓	4	Very sustainable
Governor Generoso	✓	✓	✓	✓	4	Very sustainable
Lupon	✓	✓	✓	✓	4	Very sustainable
Manay	×	✓	✓	✓	3	Not sustainable
City of Mati	✓	✓	✓	✓	4	Very sustainable
San Isidro	×	✓	✓	✓	3	Not sustainable
Tarragona	×	✓	×	✓	3	Not sustainable

The implementation of CRIS in the LCROs of Banaybanay, Manay and San Isidro are “not sustainable” because they are not currently using the system. LCRO Tarragona on the other hand, is “not sustainable” because they never used the CRIS.

Sustainability of Implementing PhilCRIS

The implementation of PhilCRIS in all LCROs in Davao Oriental, except Banaybanay, is very sustainable considering the presence of all indicators. LCRO Banaybanay's implementation of PhilCRIS is not sustainable because they stopped using the software.

Table 10 Distribution of LCROs implementation of PhilCRIS by presence of indicators

LCRO	Presence of Indicators				Total	Description
	Ind. 1	Ind. 2	Ind. 3	Ind. 4		
Baganga	✓	✓	✓	✓	4	Very sustainable
Banaybanay	×	✓	✓	✓	3	Not sustainable
Boston	✓	✓	✓	✓	4	Very sustainable
Caraga	✓	✓	✓	✓	4	Very sustainable
Cateel	✓	✓	✓	✓	4	Very sustainable
Governor Generoso	✓	✓	✓	✓	4	Very sustainable
Lupon	✓	✓	✓	✓	4	Very sustainable
Manay	✓	✓	✓	✓	4	Very sustainable
City of Mati	✓	✓	✓	✓	4	Very sustainable
San Isidro	✓	✓	✓	✓	4	Very sustainable
Tarragona	✓	✓	✓	✓	4	Very sustainable

KEY FINDINGS

The following are the significant findings of the study on sustainability of implementation by LCROs of the available information systems from PSA and the factors which affects its implementation:

1. BREQS and CRIS are currently being used by 7 out of 11 LCROs in Davao Oriental while PhilCRIS is currently being used by 10 out of 11 LCROs.

2. LCRO Tarragona was the only LCRO in Davao Oriental which never used the BREQS and CRIS software due to the "unavailability of computer units and other ICT equipment" necessary for the full implementation of the system.

3. LCRO Banaybanay is the only civil registry office that had used PhilCRIS software in the past for 1.0 year. They stopped using PhilCRIS software because the computer which was used for their PhilCRIS operation was damaged or bugged down due to virus attacks, software or hardware malfunction and insufficiency of funds to repair damaged computers.

4. At least one personnel per LCRO is assigned by civil registrar to man the computer with installed BREQS and CRIS while at least two personnel is assigned to man the computer with PhilCRIS software.

5. There is a considerable number of BREQS, CRIS and PhilCRIS in-charge who said that they encountered errors and problems in using the system. Civil registrars also reported some errors about the system.

6. Data revealed that in cases of problems with the system, there is at least one personnel from PSA who can be consulted and asked for support

7. Civil registrars believed that the implementation of BREQS, CRIS and PhilCRIS helped improve the processes and transactions in the LCRO.

8. BREQS, CRIS and PhilCRIS are currently being used by LCROs for an average of 8.8, 14.0 and 2.9 years, respectively.

9. In-charge of the systems' implementation believed that the system is usable or easy to use or with easy user interface.

10. Civil registrars revealed that there is an allocation of funds for the support and maintenance of technologies.

11. Trainings and other capacity building activities were conducted by PSA prior to systems' implementation and that the civil registrars and at least one staff attended the same.

12. A considerable number of systems' in-charge said that they have not attended any training on software operation.

CONCLUSIONS

BREQS, CRIS and PhilCRIS helped in attaining the goals of each LCRO of having faster transactions and serving their clients effectively.

In general, the implementation of BREQS, CRIS and PhilCRIS in the civil registry offices in Davao Oriental is sustainable considering the number of LCROs which are currently using these systems. The length of implementation by LCROs of these systems is high based on data. Although problems were encountered by the LCROs in implementing the systems, they tend to still continue in using the system considering the benefits they can get from operating the same. Usability is one of the factors which determines the sustainability of software or IT resources. Data revealed that the systems are highly usable according to the in-charge.

Some LCROs have funds that are allocated for the support and maintenance of available technologies. This would help in sustaining the implementation of these IT resources since funds are readily available to fix and repair the computers when it malfunctioned or got damaged or to send personnel for trainings.

Lastly, trainings are conducted by PSA prior to system's implementation. Data showed that civil registrars and at least one LCRO staff/personnel attended the same. However, considerable number of systems' in-charge said that they have not attended any training on software operation.

References and Literature Cited

Benton, Brian. (2014). Importance of Employee Training. Retrieved from https://lineshapespace.com/importance-of-employee-training/ on March 2, 2016

Commonwealth Act 3753. Retrieved from https://psa.gov.ph/civilregistration/civil-registration-laws/commonwealth-act-no-3753 on October 7, 2015

CRIS: Civil Registry Information System. October 6, 2015. Retrieved from http://baler.gov.ph/services/for-residents/civil-registry/ on October 6, 2015

Hakensen, David. (2010). Sustainability, Defined? Retrieved from http://www.minnesotabusiness.com/sustainability-defined on January 31, 2016

Kovacs, Nadia. (2014). The Importance of General Software Updates and Patches. Retrieved from http://community.norton.com/en/blogs/norton-protection-blog/importance-general-software-updates-and-patches on March 3, 2016

Leonard, J. and Klutho, E. (1989). Upward Compatibility (Hardware/Software) IEEE Potentials (Volume: 8, Issue: 1) pp 35-36. Retrieved from http://ieeexplore.ieee.org/xpl/articleDetails.jsp? On March 3, 2016

Markgraf, Bert (n.d.). The Importance of Information Systems in Organizations. Retrieved from http://smallbusiness.chron.com/importance-information-systems-organization-69529.html on March 3, 2016

National Statistics Office. 2011. PhilCRIS 3.0 User Guide. NSO Manila, May 2011.

Nielsen, Jakob. (2012). Usability 101: Introduction to Usability. Retrieved from https://www.nngroup.com/articles/usability-101-introduction-to-usability/ on March 2, 2012

Republic Act 10625. 2013. Retrieved from http://www.gov.ph/2013/09/12/republic-act-no-10625/ on October 9, 2015

Republic Act 7160. (1991). Retrieved from www.gov.ph/1991/10/10/republic-act-no-7160/ on March 4, 2016

Sustainability. (2015, October 8). In *Wikipedia, The Free Encyclopedia*. Retrieved from https://en.wikipedia.org/w/index.php?title=Sustainability&oldid=684748405 on October 9, 2015

ushistory.org. (2016). Living in the Information Age. U.S. History Online Textbook. Retrieved from http://www.ushistory.org/us/60d.asp on February 1, 2016