GIS-Based Business Permit Monitoring with SMS Notification

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ABSTRACT: Nowadays, processing a business license undergo a lot of situations to be done. It takes a lot of time, effort and patience for able to acquire the needs of a particular. There are a lot of transactions and requirements to comply before having what you need. In Addition, dealing a lot of customers in an office that can cause overcrowded and noise disturbance. Also, one of the factor for processing a business license is a period of human adulthood, Senior citizen are in need of assistance by their relatives for filing their personal data and business information. Although there are a priority lane for them but still it can cause delay for others. Therefore, in order to gather business license in a fastest and easy way, developing a research study for the areas around Sagay City, Negros Occidental: Geographic Information System (GIS)-Based Business Permit Monitoring with SMS Notification. Its main purpose is to process big enterprise permits in easy and fastest way and also renew permits that is already expired through online using internet and mobile phones, laptop and PCs. Through the use of Business Permit Monitoring it helps the staff of Sagay City Licensing Deparment (SCLD) to track Personal records and Business records of every individual who is already registered. Also, through the use of GIS it helps the staff and users to identify the location of every businesses and find which one is already expired by the use of color-marker. For SMS Notification, its task is to send notification to businesses that is already expired.

KEYWORD: GIS, Business Permit, Monitoring, SMS Notification

I. INTRODUCTION

Having a Business is one of major aspects of every individuals when it comes to source of income. It provide daily needs to families for living. As a business owner, you have to make sure that profits grow steadily to meet your needs.

When it comes to managing business it acquire huge obligation, considering that if it will going to grow or not. But before heading up to that ground, one thing is to recognize, it is to acquire for a business permit. Business permit is a document need to business owners in order to legally sell goods and other products to its company or store.

Sagay City Licensing Department (SCLD) provide a group of inspectors who check or visit establishment if it has already submitted all the requirements or if it is already expired and need for renewal. Joint Inspection Team (JIT) is capable of doing this thing. Having a legal paper to operate a business can make a complacent feeling to every owners. Worry no more to those who are already update their papers regarding to annual renewal of permits. It gain an advantage against those enterprise who are your competitors.

Many researchers conduct a study regarding to Geographical Information System (GIS) technology and how it use in the study. Basically GIS is use for mapping to locate the area where the establishment standing. It is the combination of monitoring business permit profile and tracking its location. Also, with the use of SMS notification it provide double impact to every users because it notifies them that their business license is already expired. It is limited only to big enterprises within the grounds of Sagay City, Negros Occidental.

According to the study entitled Food facilities mapping and profiling: Basis for sanitary inspection and health education (K. Soberano, 2019), considered that one of the characteristics of quality service that a restaurant may provide to its patrons is food safety and sanitation. Conversely, health education is a programme that advocates for several measures to improve cleanliness. Utilizing the Geographic Information System (GIS), a computer programme that analyses, modifies, and displays geographic data. Additionally, it is employed in this study to categorise and identify food facilities that require sanitary inspection.

The study of E.C Fradelos et al. entitled Health based geographic information systems (GIS) and their applications," n.d. . The application of geographic information systems (GIS) to public health concerns has been growing exponentially and has proven

essential to understanding and treating health issues in various geographic locations. Health professionals have been able to operate more productively in recent years because to the adoption of various information technology services and applications.

The book by Stephen Wise describes how many individuals frequently use spatial data in a way that was formerly the domain of GIS specialists. GIS technology is becoming more widely available to a wider audience on devices, from apps on smartphones to satnavs in cars. Even yet, academic papers and articles that need specialised knowledge or some training in computer science typically describe how spatial data is stored and analysed on a computer. Designed to expose geography students to computer science literature, this resource offers an approachable analysis of the fundamental ideas for those without specialised computer science expertise.

It is becoming more widely acknowledged that some aspects of the built environment may have a significant role in determining obesity. Base on the study of L.E Thornton et al. (2011). With the aid of GIS, researchers can now more easily obtain data pertaining to the built environment and can develop novel environmental exposure metrics, including calculating the quantity of green space in a neighbourhood or the distance to the closest grocery. A glossary on the application of GIS to the evaluation of the built environment is appropriate given the quick advancements in the accessibility of GIS data and the comparatively simple nature of GIS software. Using the food and physical activity contexts as a case study, describing important GIS words pertaining to data collection, concepts, and the measuring.

According to the study the example alluvial area's groundwater contamination risk map was created by building and superimposing thematic maps using the Ilwis Geographic Information System (GIS). The socioeconomic worth of the groundwater resource, as indicated by the wells, as well as the vulnerability and hazard maps—where possible contamination sources were identified—were the origins of the risk map. The groundwater quality map made it possible to test the accuracy of risk and hazard maps. The completed map displays intriguing findings and emphasises the necessity for the GIS to evaluate and enhance the techniques for assessing the risk of groundwater contamination.

Even in a city like Yogyakarta, which is widely known throughout the country as a City of Students, the government has issued numerous business permits for DVD rentals. As they say, ugly truth, but this is obviously a betrayal of the Indonesian Central Government's programme to combat copyright theft. It is almost hard to think that the Yogyakarta administration was unaware that these companies were using the proceeds from illegal sales as their main source of funding. According to A.A. Mukmini's study, "DVD rental business permit in Yogyakarta," (n.d.), has been making every effort to uphold copyright and support the Anti-Piracy Campaign.

E-government has become a significant component of public service delivery. On the other hand, some local government e-services only provide interactive materials, including application processes and form downloads, and thus require a lengthy completion time. Thus, according to the study of JJ S. OŃATE 2019, the primary goal of the project is to create a system that will use the business permit and licencing system, or eBPLS, to expedite the application process for business permits and licences into an electronic version. A modified version of the Princeton Project Development Methodology (PPMP) was used in this study as a framework to organise the software development process.

As stated by J. Joshi's (2016) paper, "Smart Garbage Monitoring System," The goal of dustbins, in relation to using monitoring systems, is to raise awareness of cleanliness. A central hub/sink for all the dustbins in the region is made possible by the low-cost, low-power smart sensors placed in hundreds of dustbins. These sensors are coupled to an Internet of Things device. The bins send their geolocation information and the condition of their contents to a central hub, which then sends this information to a cloud platform. The client app receives data from the cloud platform and displays it on a map along with the bins' current location and state (full or empty).

Nowadays, mobile phones—which are used for communication and to access a variety of information—are seen as an indispensable component of peoples' daily lives. Mobile phones are being used for more than just communication; they may also be used to subscribe to value-added services including alert systems, notifications, and disaster warning. The study written by R. Lumauag (2016), with the introduction of School Event Notification Through SMS (SENT SMS), parents, instructors, and students can now get up-to-date information directly onto their mobile device from the school. Students will be informed about forthcoming school activities, modifications to the event schedule, and weather-related class suspensions by SMS notification. Teachers will be informed about deadlines for requirements, emergency meetings, and meeting schedules. Parents will furthermore notified about the school activities and be aware of the activities of their children.

Muhammad Siddik Hasibuan et al. (2019) define gas as a molecule that is formless, unbound, and invisible. Under specific temperature and pressure conditions, it can also solidify or become search. In Indonesia, LPG gas is a major contributor to flames; a broken gas regulator is a common cause of LPG gas fires. To reduce fires, security and prevention are therefore essential. Observing this and taking into account the advancements in technology, an intelligent Arduino-based device was developed that solved this issue. Propane and butane gas can be detected by an embedded device using a system that can transform input data

from the Mq-2 sensor. The system then sends the actual data in the form of short messages (SMS) to the mobile phone that has been registered with the system will receive the actual data in the form of short messages (SMS) from the system. The device can deliver SMS messages in addition to producing a sound that comes from the buzzer.

Objective of the Study

The purpose of this study is to provide software for Sagay City called GIS-Based Business Permit Monitoring with SMS notification. To assess the system's performance based on expert testing with McCall's Software Quality Model, taking into account the software's correctness, reliability, efficiency, integrity, maintainability, usability, and adaptability. Furthermore, the acceptability level of the system in relation to the necessary application functionality. Create a system that can quickly and easily accept client transactions. In addition, for getting client details and establishing an online transaction processing system to expedite the process for those who require it.Utilising GIS to track the location of businesses and SMS for alerts.

Scope

The proposed capstone project aims to enhance business transaction processing and data management. The system will facilitate better decision-making and logical operation in business management. Additionally, it will provide the licencing department with more efficient time for services. Access to the system and the ability to encode client personal and business data is restricted to the manager and staff. The GIS_BBPM with SMS Notification system is limited to the grounds of Sagay City and is only intended for the development of recording client data and tracking business location.

II. METHODOLOGY

The researchers will be using the developmental method of research in this study. Developmental research, as opposed to simple instructional development, has been defined as the systematic study of designing, developing, and evaluating instructional programs, processes, and products that must meet criteria of internal consistency and effectiveness. Developmental research is particularly important in the field of instructional technology. The most common types of developmental research involve situations in which the product-development process is analysed and described, and the final product is evaluated. A second type of developmental research focuses more on the impact of the product on the learner or the organization. A third type of study is oriented toward a general analysis of design development or evaluation processes as a whole or as components. A fundamental distinction should be made between reports of actual developmental research (practice) and descriptions of design and development procedural models (theory). Although it has frequently been misunderstood, developmental research has contributed much to the growth of the field as a whole, often serving as a basis for model construction and theorizing. *(ERIC - ED373753.*, 1994," n.d.)

This chapter outlines and clarifies the study's methodology. The research design, system design, and technique are covered in this chapter. This section outlines the research design and methodology, which covers data collection techniques, instrument development, sampling design, and research procedures.

Locale of the Study

This study conducted at New Government Center Licensing Department (NGCLD) at Poblacion I, Sagay City, Negros Occidental.

Figure 1.0 Locale of the Study

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Figure 1.0 above show the location of the New Government Center Licensing Department (NGCLD) which located at Poblacion I, Sagay City, Negros Occidental where the study was conducted.

Data Collection

In collecting data, the researchers conducted interviews to the manager and staff of New Government Center Licensing Department. They have to collect relevant data which are needed in the development of the project.

Sampling Method

The population of the study are the NGCLD Manager and NGCLD Staff. The researchers used the purposive sampling since the total respondents is twelve (9).

Respondents	Number of Respondents
NGCLD Manager	1
NGCLD Staff	8
Total Respondents	9

Table 1.0 Population of the Study

Table 1.0 above shows the total number of respondents. The following are NGCLD Manager (1) and NGCLD Staff (8). Total of (9) respondents.

System Design
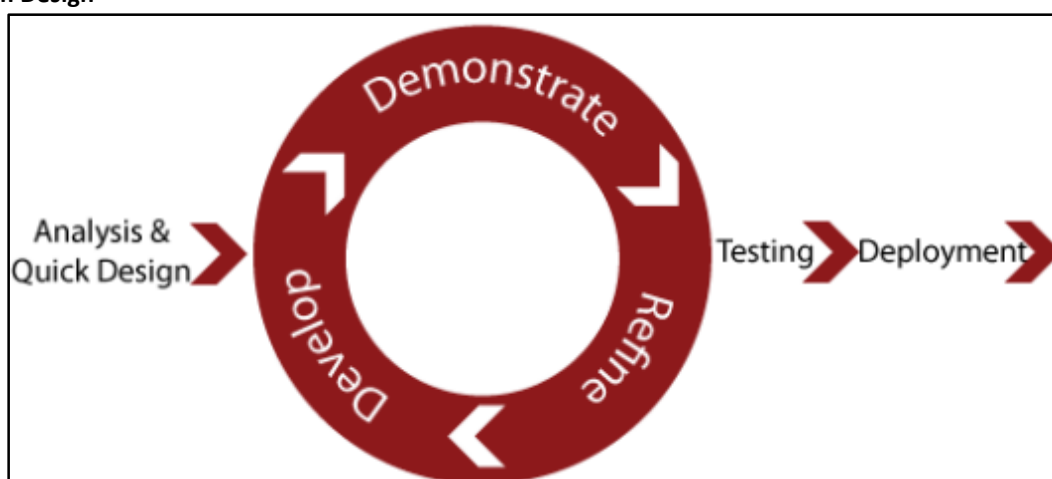
Figure 2.0 Rapid Application Development Model (RAD)

Figure 2.0 shows the RAD Model that presents different processes to researchers the needs to observe in quidance throughout the development of system.

Planning and Analysis Phase

The researchers planned and analysed the various requirements and activities required for the development of the proposed system during this phase. These included the necessary interview preparation and various procedures, and they were able to achieve the objectives, which included gathering data for the NGCLD office in order to achieve the system's recommended features.

Development Phase

The prerequisites listed below are necessary to construct the system. It consists of the three parts of a computer system: people ware, hardware, and software.

Software Requirements

The importance of the software during the development and the implementation of the system must be given attention for the system needs compatible software so that it can perform its desired functions. The software requirements are the following; Operating System – Windows 7 and 10, Apache Web Server (UwAmp), Brackets (IDE), MySQL, PHP, Javascript, CSS,

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HTML and Bootstrap. Hardware Requirements The importance of the hardware during the development and the implementation of the system must be given attention for the system needs compatible hardware so that it can perform its desired functions

Hardware Requirements

ROM, Router, Rj45, Unshielded Twisted Pair, Hard Disc Drive 232 GB, Resolution 1366x768, QWERTY Keyboard, USB Optical Mouse, Processor: Intel(R) Core(TM) i3-5005U CPU @ 2.00GHz 2.00GHz, Memory: 4GB, Disc Storage: 160 GB (minimum), ROM, Hard Disc Drive 232 GB, and so on are the list of hardware requirements for development and implementation of the system.

III.   RESULTS AND DISCUSSIONS

Based on the study obtain by the researcher it fulfil the prerequisite needed to implement in the developmental process for the system GIS-Based Business Permit Monitoring with SMS Notification. Visible below the list of screenshots with its corresponding explanation on how that particular interface work.
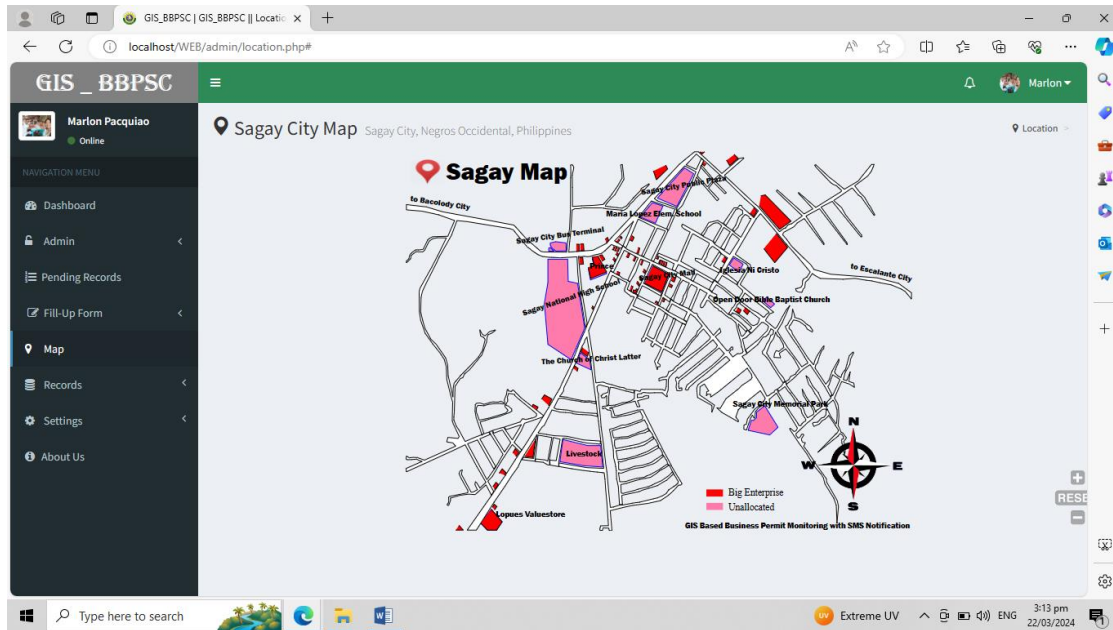
Figure 3.0 GIS – Sagay City Map

Figure 3.0 shows the Map and the scope of the study within the vicinity of Sagay City, Negros Occidental. Red colors on the map signify for business that is Big Enterprise and pink one state for unallocated business.
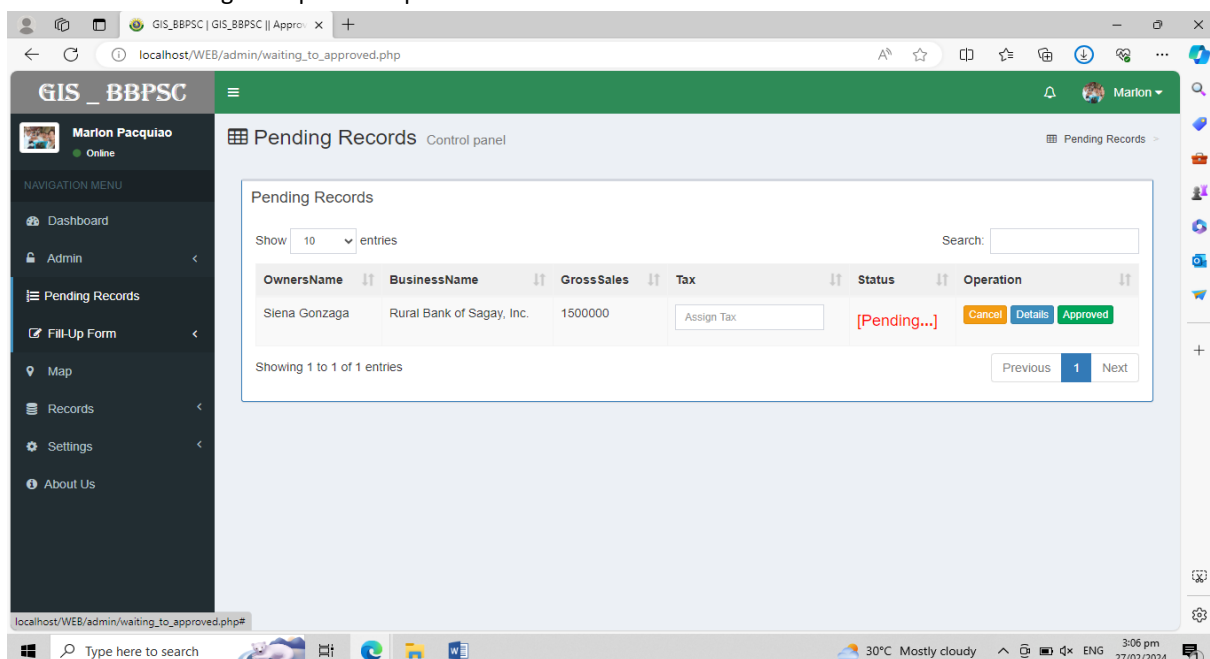
Figure 4.0 Pending Records

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Figure 4.0 shows the list of pending transactions coming from the clients that need to renew their business permit.

Figure 5.0 Registration Form

Figure 5.0 shows the Registration for base on clients Personal Information.

Figure 6.0 Business Information

Figure 6.0 shows the Registration Form based on clients Business Information

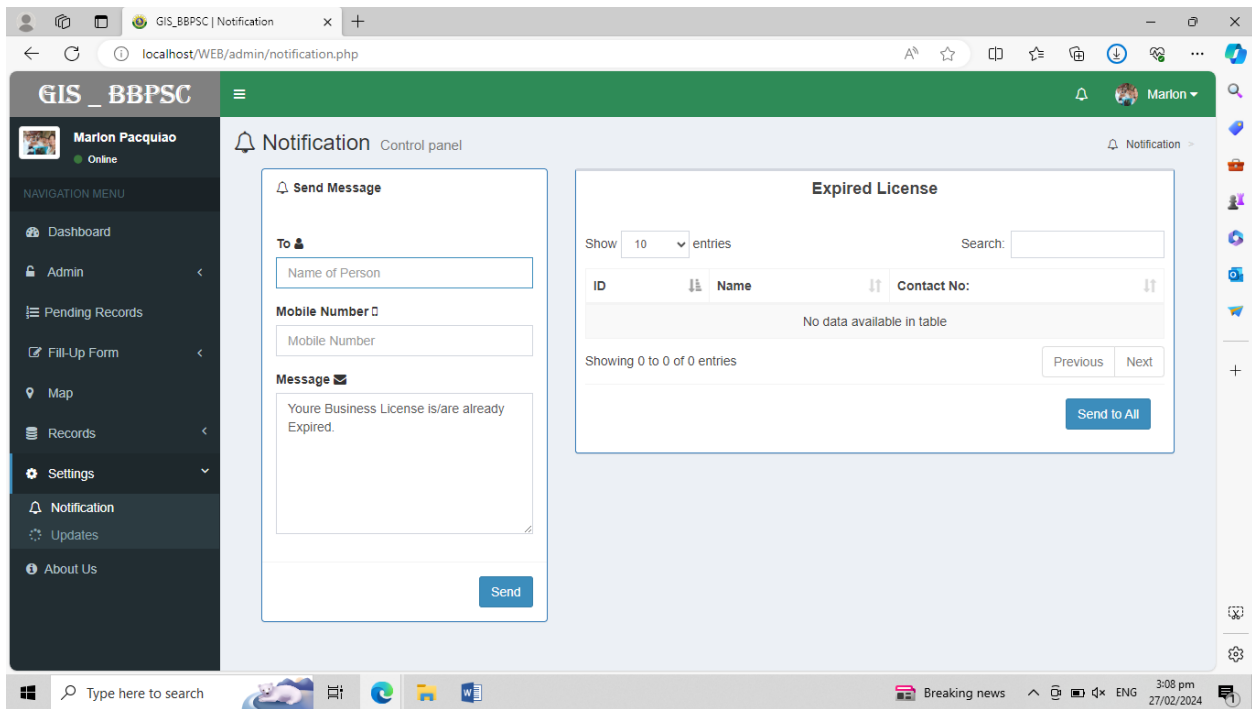**GIS-Based Business Permit Monitoring with SMS Notification**

Figure 7.0 Notification and List of Expired License

Figure 7.0 on the left side shows the notification interface and the right side shows the list of expired license

IV.   CONCLUSION

Based on the development of the study GIS-Based Business Permit Monitoring with SMS Notification it shows that the objectives of the study meet the corresponding needs of the system. Starting from gathering of relevant literature and existing study from different social networking sites it clearly seek a solution to fill-in the gaps based on my research study.

Furthermore, the study's findings lead the researchers to the conclusion that the system is a good quality system that is dependable, flexible, and easy to use. It also offers a quick and simple way to obtain client and business information. In terms of the geographical interface for locating the registered business's area, it shows that the map is capable of performing its functions. Additionally, notifying licence holders whose licences have already expired will have an impact since they will be notified immediately by Short Message Service (SMS). Lastly, the system automatically provides the necessary data for the user to obtain while creating reports.

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