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UTILIZATION OF POWER BI IN THE WEB-BASED SYSTEM OF THE ILOILO SCIENCE AND TECHNOLOGY UNIVERSITY HOTEL MANAGEMENT

Software Requirement Specification

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Introduction

This Software Requirement Specification document provides a complete description of all the functionalities and the specifications of project entitled "Utilization of Power BI in the Web-based System of the Iloilo Science and Technology University Hotel Management" covering the two (2) hotels namely: Hotel and Restaurant Technology Service Center, and Technology and Livelihood Education Center. The developers and the testers can use this document as a reference for developing the design and test plan documents for an effective, efficient and reliable system requirement needed.

The hotels of Iloilo Science and Technology University (ISAT U) do not have an existing computerized system. Their reservation and billing is manually done. The calls and emails from their client are written on a small piece of paper and are being stuck into their calendar. Reservation and payment transactions are manually computed causing back logs and problems in managing the operation of the hotel.

This study introduces the utilization of Power BI in the Web-based system of the Iloilo Science and Technology University Hotel Management that will help in the overall transaction and operation of the hotel and at the same time reduce the immediate involvement of manpower. The hotel reception room reservation, billing and producing dashboard with meaningful information that support decision making and the capability to generate reports are the main focus of this paper.

The system plays a great role and has a potential effect on the day-to-day performance measures in the institution. Therefore, the use of the system has become a necessity to any high learning institution or prestigious company due to the rapid change of technology nowadays. The system will lead to a better performance and can be used with a large number of users at the same time. It does not only save time and resources but also creates awareness of the evolving technology.

Purpose

The purpose of this document is to describe a detailed requirements for "Utilization of Power BI in the Web-based System of the Iloilo Science and Technology University Hotel Management." This will help enlighten the developers and testers on the different functional and non-functional requirements of the system, the interfaces of the system, what the system will do or how it will

interact with the external users, and the constraints of its
operation.

Generally, the Software Requirement Specification document
will provide a clear and profound understanding of what is expected
to be done by the administrator, staff, researcher, HRT students
and customers in the proposed system for easier transactions. This
will also give a clear idea on how the software should be developed
by the researcher for the end users. Since, the major feature of
the proposed system is the utilization of Power BI to create
dashboard that allows Decision Support Capabilities of the system.
This will matter in the allocation of resources and budget that
supports decision making.

Scope and Limitation

This project intends to develop "Utilization of Power BI in the
Web-based System of the Iloilo Science and Technology University Hotel
Management," which is responsible for the management of transactions
between customers and the hotel.

It aims to put its strategic thrust by investing in new
technology and its people. It is a computerized system that not only
address the needs of the organization, but also plays a vital role in
the employees' performance of their responsibilities towards their
clients. As time progress, it will generate assets that technology
brings by utilizing Microsoft Power BI tools into the website. It will
provide decision makers a data visualization for better decision
making for budget and resource allocation. The system on the admin
interface has 'Dashboard' that generates insight on the data gathered
in the transaction of the hotels and its services. 'Facts and Figures
Tab,' has the information on sales of all the products and services
of every hotel. 'Contact Us Tab' the customer can inquire, and the
admin can receive the inquiry and reply it. 'Website Management Tab',
use to maintain the website that serves as the service-based business
website that used to convince potential visitors of the company.
'Settings Tab' integrates security and control of the overall access
of the system, has activity logs and can manipulate data that will be
generated in the dashboard.

The system has no machine learning capabilities, it will use
formulas and the data gathered in generating results in its
dashboard and reports. The system will not function accurately in
the absence of internet connection.

Hence, by means of well-organized tasks and duration of the
proposed system, the hotel management can use the results of this
research in understanding the problems before the system's

implementation, within scope and fulfill all the system
requirements.

Use Cases

The following describes the actors in the user needs document by using the activity diagram and use case diagram of "Utilization of Power BI in the Web-based System of the Iloilo Science and Technology University Hotel Management":

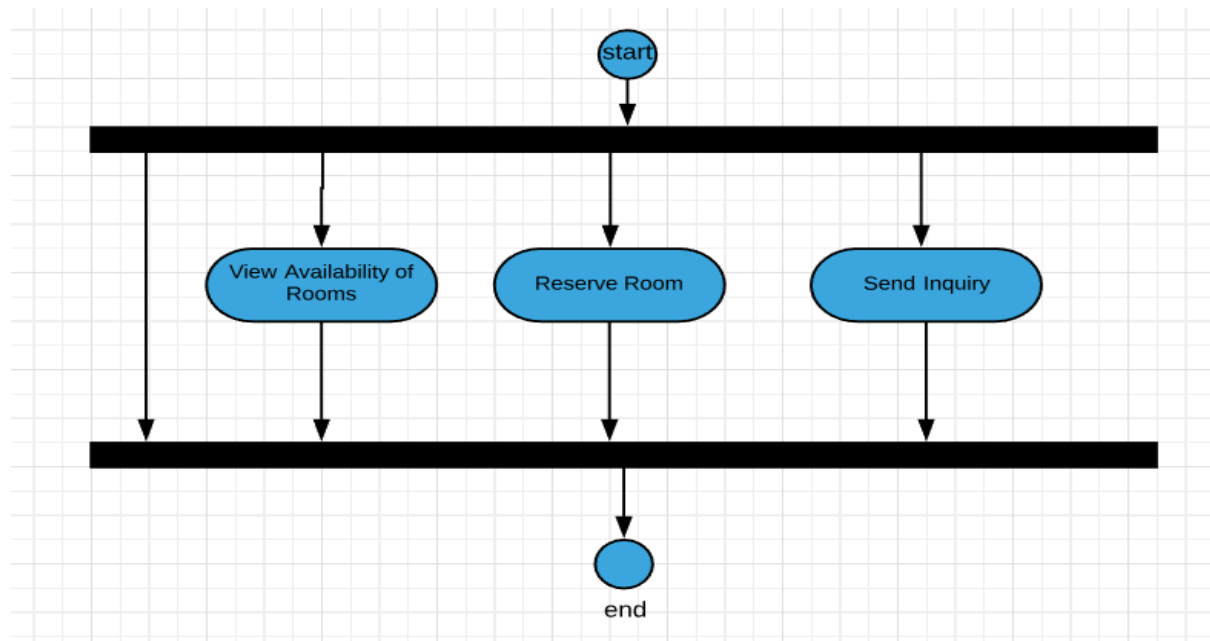### Activity Diagram for Different Actors

FIGURE 1. Class Diagram for Customer

In Figure 1, shows the activity diagram of the customer. Activity diagrams portrays the primary flow of the system and the relationship among the activities in a process. As we can see, the customer can view directly the availability of rooms. If the customer wants to reserve a room online at their own convenient time, the customer will fill out the personal details (complete name, e-mail address, contact number, home address and package to avail). The customer will receive a notification message via e-mail that his/her reservation is successful. For confirmation of customer's reservation made, the system will accommodate the online and walk-in or phone call payments for the convenience of the customers. For payment, this will be paid with a 50% down or full payment through landbank deposit or on-site. The customer can also check and cancel his/her reservation as well through the 'Contact Us' button.
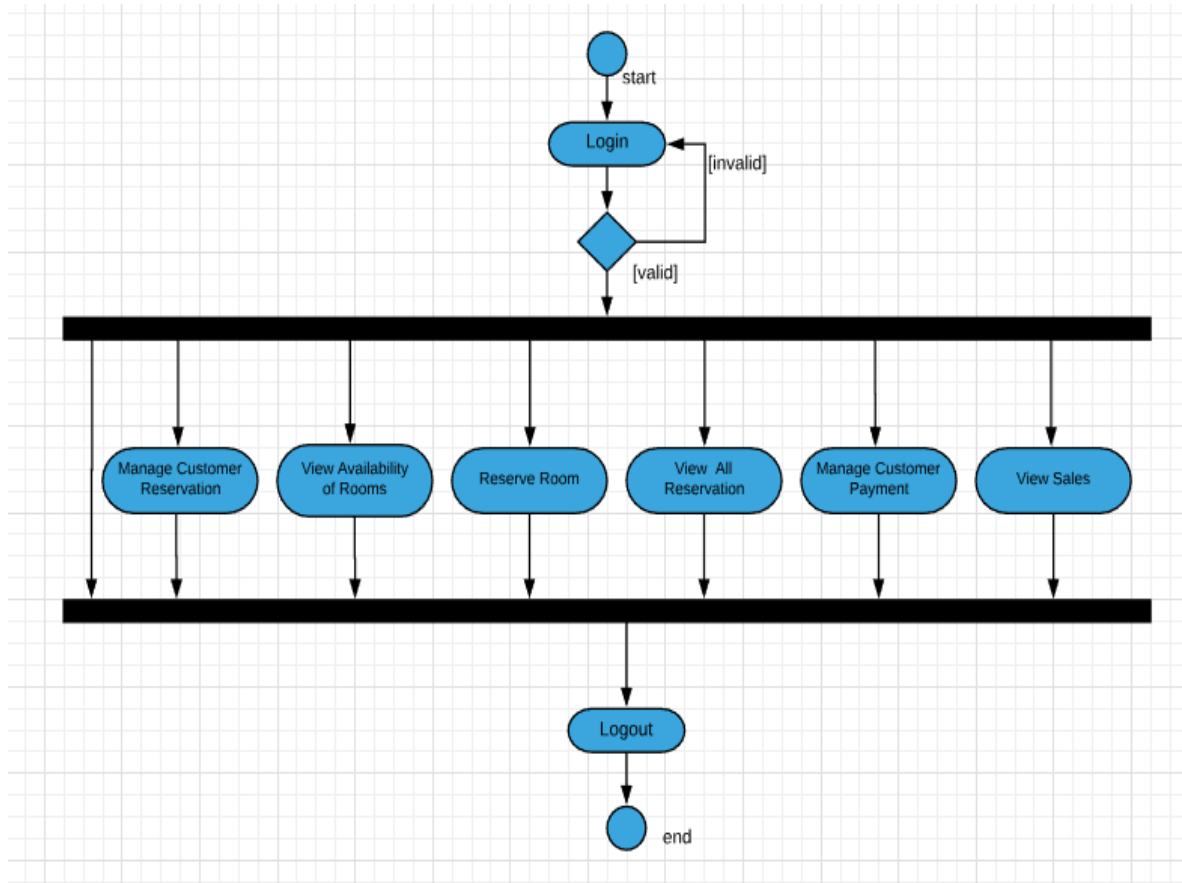
FIGURE 2. Class Diagram for Staff

As illustrated in Figure 2, it shows the activity diagram of the staff. Activity diagram portrays the primary flow of the system and the relationships among the activities in a process. The staff can log-in and log-out to the system as authority given by the administrator. Basically, staff can view availability of rooms and reserve room. The staff manage customer reservation like searching, viewing, editing, cancelling and confirming. If there is an existence of walk-in or phone call customer, the staff is tasked to create a new reservation.

Generally, the staff at all times is mainly in-charge in managing the customers' reservations and accounts, and other transactions as authorize by the administrator or manager.
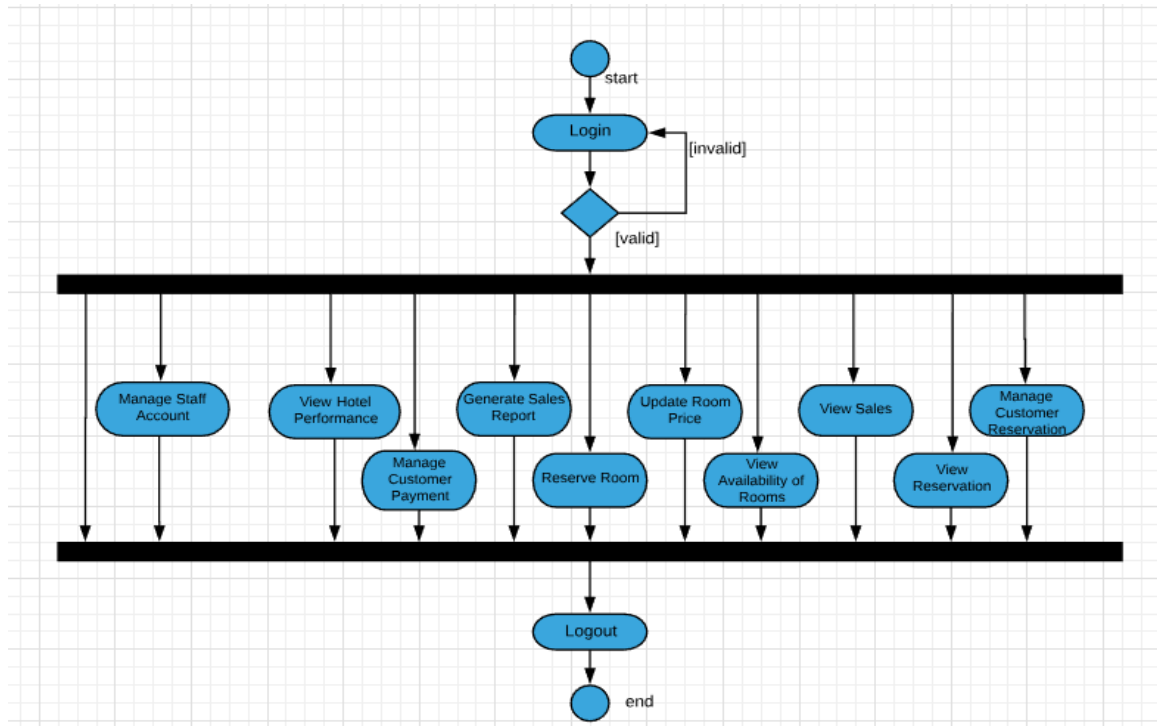
FIGURE 3. Class Diagram for Administrator

In Figure 3, it shows the activity diagram of the Administrator. The hotel manager must log-in in order to access the system. The administrator is required to enter his/her username and password.

If it is invalid, the system displays an error message and the administrator can log-in again. If it is valid, the administrator can proceed to his/her dashboard. The system on the admin interface has 'Dashboard' that generates insight on the data gathered in the transaction of the hotels and its services (under Power BI). Wherein the admin can generate customer sales report and view hotel performance. In 'Facts and Figures Tab,' has the information on sales of all the products and services of every hotel where the admin can generate sales report. 'Contact Us Tab', the customer can inquire and the admin can receive the inquiry and reply. 'Website Management Tab', use to maintain the website that serves as the service-based business website that used to convince potential visitors of the company. 'Log Trail' integrates security and control of the overall access of the system, has activity logs and can manipulate data that will be generated in the dashboard (under Power BI).

Generally, the administrator has the full authority and control of the system.
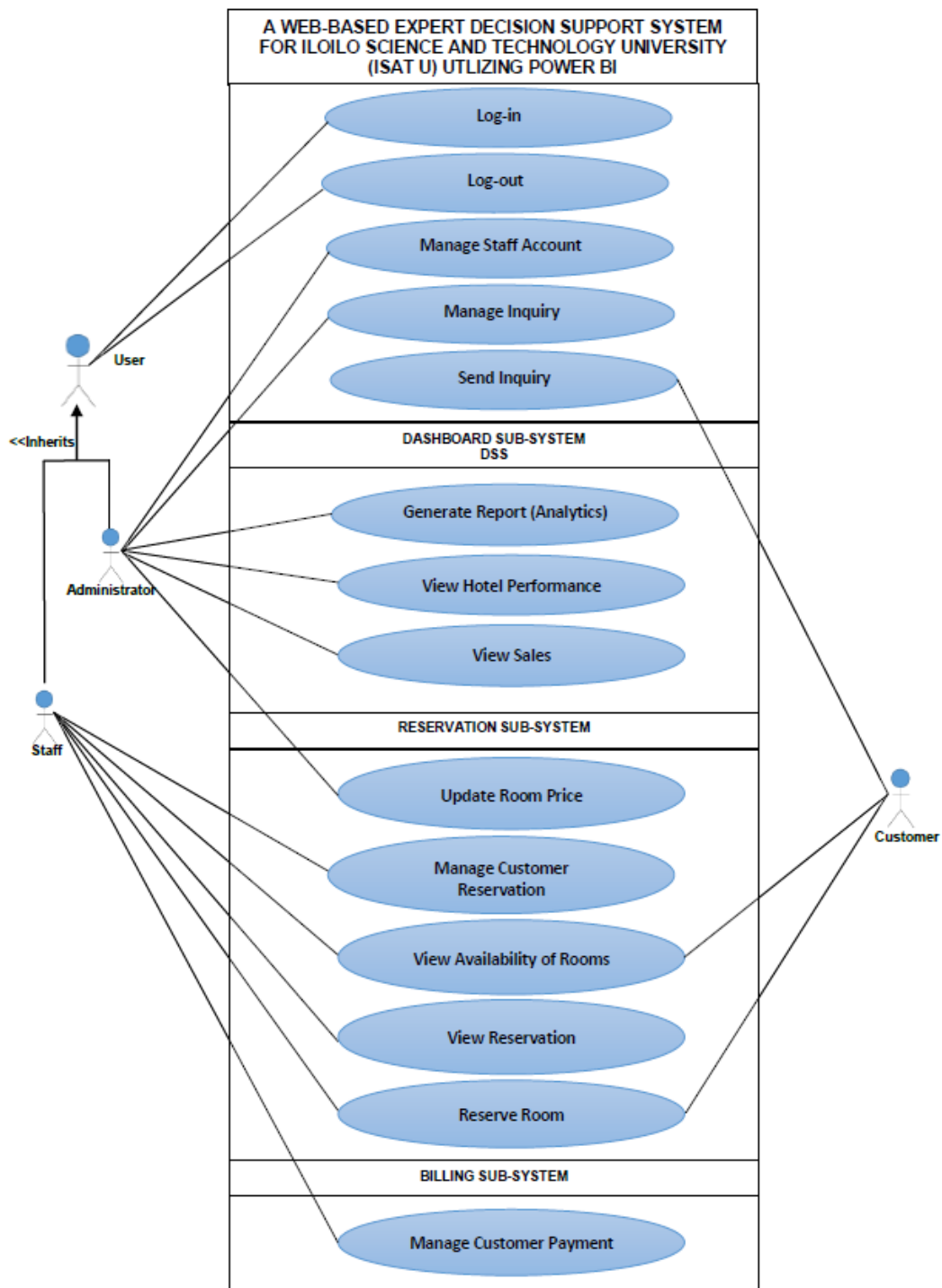
Use Case Diagram

FIGURE 4. Use Case Diagram for Proposed System

In Figure 4, the Use Case Diagram illustrates the behavior of
the system and the different kinds of user that are able to interact
with it.

In Dashboard Sub-system allows decision support capabilities of the system which makes use of the generated report and make sense out of it to improve the overall performance and operation of the ISAT U hotels. The utilization of Power BI into the website is a new way to monitor business using important metrics providing a consolidated view of the data at a glance. With these, the admin can view hotel performance, generate sales report (analytics), and view sales.

In Reservation, the hotel administrator/staff can log-in and log-out to the system. The staff can view availability of the rooms, reserve room and view total reservations at the same with the customer as well. The administrator can manage customer reservation via online and walk-in or phone call customers by inputting the necessary data given, and update room price.

While in Billing, the administrator/staff confirms the reservation so that the customer will pay the 50% down payment or full.

Generally, the administrator has the complete control access to the system. He/She has the authority to update the user account of the system.

Use Case Suite

Functional Requirements

The functional requirements define the fundamental actions that system must perform. This contain all the information of the software requirements for the development of "Utilization of Power BI in the Web-based System of the Iloilo Science and Technology University Hotel Management."

With that, the following lists of all the features will be elaborated using the feature set.

Non-Functional Requirements

The non-functional requirements define the needs in terms of performance, logical database requirements, design constraints, standards compliance, reliability/up-time, usability, availability, safety, security, maintainability/upgradability, and portability.

Performance

This requirement describes the acceptable response time for the proposed system entitled "Utilization of Power BI in the Web-based System of the Iloilo Science and Technology University Hotel Management" functionality. The performance of the system will highly depend on the performance of the hardware and software components of the installed computer as well as the speed of the internet used. When considering the timing relationships of the system, the loading time for user interface screens shall take no longer than two seconds. For the log in information, it shall be verified easily and will not take longer to wait because of the system efficiency.

Therefore, the proper maintenance of system information shall always observed by the system administrator.

Logical Database Requirements

The logical database requirements include the retention of the following data elements. The following list is designed as a starting point for the development of "Utilization of Power BI in the Web-based System of the Iloilo Science and Technology University Hotel Management":

- Customer name
- Customer address
- Customer e-mail address
- Customer contact number
- Customer home address
- Staff username
- Staff password
- Hotel Administrator username
- Hotel Administrator password
- Room Type
- Venue Type
- Occupancy Type

- Room rate
- Venue rate
- Number of occupants
- Rate description
- Cancellation date
- Expected check-in date
- Expected check-in time
- Actual check-in date
- Actual check-in time
- Expected check-out date
- Expected check-out time
- Actual check-out date
- Actual check-out time
- Payment received (yes/no)
- Payment type (Online Reservation/Walk-in/Phone Call:Cash)
- Confirmation number
- Total Bill
- Number of Customers Checked-in (Monthly/Yearly)

Design Constraints

Utilization of Power BI in the Web-based System of the Iloilo Science and Technology University Hotel Management shall be not a stand-alone system running in a Windows environment. The system shall be developed using Photoshop, HTML, PHP, CSS, Javascript, MYSQL, Microsoft Azure (Windows Azure), and utilization of Power BI as Decision Support Capabilities of the website. The system will be web-hosted through Microsoft Azure in cloud-based.

Standards Compliance

There shall be consistency in variable names within the system. The graphical user interface of "Utilization of Power BI in the Web-based System of the Iloilo Science and Technology University Hotel Management" shall have a consistent appearance that is relevant to the theme of the academe.

Reliability and Up-time

In terms of reliability and up-time, the system will be consistent in securing data entry. In any case of failure, the system can recovers data and continue its performance. By maintaining backups ensure the system database security. As such, the administrator shall always observe the system to maintain the

data integrity, i.e. there are no redundancy, missing, and/or ambiguous information that could mess up the processes and outputs.

Usability

Utilization of Power BI in the Web-based System of the Iloilo Science and Technology University Hotel Management shall provide the entire system easier to use for hotel administrator, staff and customers. This will give an easy access of the new system with a user friendly environment like navigating and printing.

The user interface should be as familiar as possible to the users who have used other web applications and any Operating System/Windows desktop applications. This system will provide the decision makers a data visualization for better decision making for budget and resource allocation. It will facilitate also the data gathering activities for reservation a room, transaction for billing purposes and generation of meaningful dashboard and report as a mechanism that enables decision support capabilities.

Availability

Utilization of Power BI in the Web-based System of the Iloilo Science and Technology University Hotel Management shall be available 24/7 operating hours.

Security

The hotel administrator has the full authority to access the proposed system entitled "Utilization of Power Bi in the Web-based System of the Iloilo Science and Technology University Hotel Management." The system will have a registration module that allows the administrator to register the authorize staff to use the system. The staff assigned to the reception area will serve as the administrator also, however the administrator can only generate the report. The hotel administrator and staff will be able to log-in to the system by entering the username and password.

Maintainability and Upgradability

Utilization of Power BI in the Web-based System of the Iloilo Science and Technology University Hotel Management is being developed in Photoshop, HTML, PHP, CSS, Javascript, MYSQL, Microsoft Azure (Windows Azure), and Power BI as Decision Support Capabilities of the website. With this, the system provides proper maintenance of the application by the system administrator that

will promote easy maintainability and upgradability, especially in
cases when the database information needs to be updated.

Portability

Utilization of Power BI in the Web-based System of the Iloilo
Science and Technology University Hotel Management shall run in
different browser and operating system. The system can adapt to
changes in different environment.

Environmental Requirements

The following are the requirements needed for the
implementation of "Utilization of Power BI in the Web-based System
of the Iloilo Science and Technology University Hotel Management":

System Hardware Requirements

1. Computer with complete accessories
2. Printer
3. Uninterruptible Power Supply (UPS)
4. Internet Connection

System Software Requirements

1. Operating System (preferably Windows)
2. Browser
3. Microsoft Power BI
4. Photoshop
5. MySQL
6. Microsoft Azure (Windows Azure)
7. PHP
8. CSS
9. Javascript
10. HTML

Application Program Interfaces (APIs)

This system "Utilization Power BI in the Web-based System of the
Iloilo Science and Technology University Hotel Management" required
an API for decision support capabilities.

Data Import and Export Requirements

This system entitled "Utilization Power BI in the Web-based System of the Iloilo Science and Technology University Hotel Management," the data will be imported and exported via the website. The web interface will access the Microsoft Azure (Windows Azure) and MySQL to update and generate reports based on stored data. Thus, all the data needed by Power BI to generate report is connected to Microsoft Azure.

System Architecture