



The Development of an Online Gym Booking System (OGBS) using Online Membership Business Model

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ABSTRACT

Online Gym Booking System (OGBS) is an online booking system for Workout Fitness Gym. It enables customer to book for classes and personal trainer via online. In addition, manager is provided instant access to sales data thus able to make decision faster. OGBS is proposed as a solution to current way of inefficient booking management that requires the stakeholders to update class availability and perform booking task in a manual way. The system was developed by adapting the Waterfall Model of SDLC. Online Membership Business Model on the other hand served as a theory to complement in OGBS development. In addition, two additional phases which are preliminary study and documentation were added to ensure the project will achieve all the outlined objectives. The system was tested for its functionality and usability by the developer, expert testers as well as 30 other respondents. The highest mean gathered is 4.87 (SD= 0.36) for Online Membership Construct.

Key words: Gym Booking System, Online Membership Model, OGBS

1. INTRODUCTION

Nowadays, due to intense working schedule, many people prefers to spend their time in the gymnasiums (gym) for workout instead of going for outdoor activities. To ensure access to the gym facilities is available when required, customer needs to make an early reservation. There are gymnasiums that are still using manual procedures for handling booking process. Manual booking process has the potential to drive up operating costs, such as overtime pay for staff and the process of booking is time consuming. The development of an online gym booking system gives a huge advantage to the organization especially for handling the customer's booking data. By having access to the online system, customers can check for class and personal trainer availability and perform booking transaction outside of normal business hours. A survey was conducted among 30 respondents who are existing customers of a gym used for the case study, Workout Fitness Gym. The result (90% of the

respondents) has shown the need for a new way of handling booking process. Figure 1 illustrates the finding.

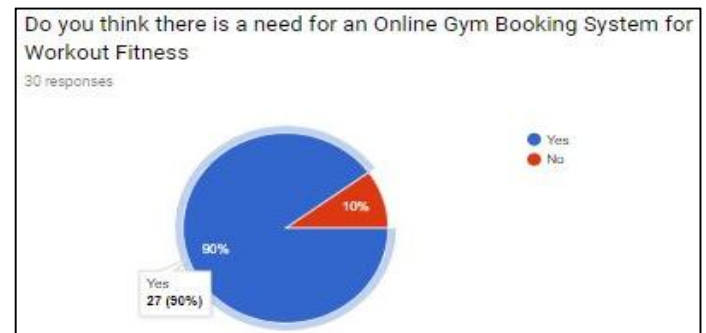


Figure 1: The Need for an Online Gym Booking System

1.1 Current Booking Process

Currently, the booking process flow for Workout Fitness Gym starts when the customer comes to the gym for a class or personal trainer booking. Specific information is needed when the customer make booking. The customer can choose either they want to book for a class or a personal trainer. The customer chooses the booking date and time. Then, the staff will check the availability of class and personal trainer schedule in order to continue with the booking process. If the time slot requested is not available, customer need to change for another time and date. If there is availability of the class or personal trainer, the staff will request for customer's personal detail and booking information. The staff will record the information in a booking form and a log book.

An interview conducted in a preliminary study phase with the Workout Fitness Gym owner highlights few issues in current way used in managing booking process. The first issue that occur is customers need to walk in to the gym to book for the class or personal trainer. One class is only limited for 25 persons and one personal trainer is limited for 3 persons. When the class and personal trainer schedule is full, the customer need to reschedule to other time or they need to wait in the waiting list.

The second issue is customer face difficulties to find the availability of the class and personal trainer schedule. This is because the staff needs to browse through the availability of the class and personal trainer in booking form and logbook. Hence the customer couldn't get enough information of the availability of the schedule instantly.

Double booking may occur is the third issue. The staff needs to record all the booking detail manually in a booking form or logbook thus the data maybe redundant. Besides, the data and information are recorded using paper. There are cases where this paper based form is misplaced causing the loss of booking information.

Based on the problem stated, an online gym booking system is seen as a solution to help the management in handling the business operations and also help the customer to manage their booking easily. Figure 2 provides comparisons between current manual booking process and proposed booking process via system.

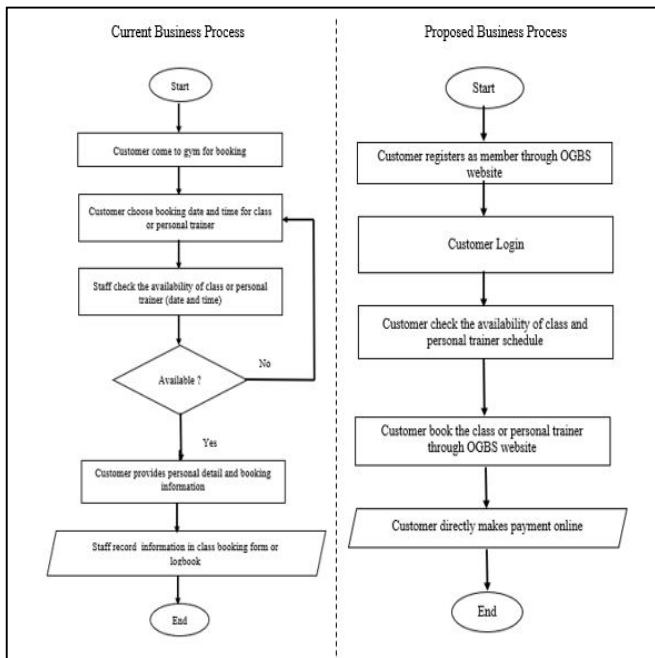


Figure 2: Comparison Between Current Business Process and Proposed Business Process for OGBS

2. RELATED WORKS

2.1 Online Booking System

An online booking system is a software that allows a customer to book and pay for an activity or service directly via online channel [1]. That means from the moment a customer decides they want to book, to choose a date, picking a time and paying for the booking, everything is handled online. Online Booking System is designed to facilitate online reservation for customers as well as staff and agents [2]. Table 1 summarizes characteristics of an online booking system according to [3], [4] and [5].

Table 1: Characteristics of Online Booking System

Author \ Components	[3]	[4]	[5]
Real-time booking	/	/	/
Calendar	/	/	/
Multiple payment option	/	/	/
Multiple language	x	x	/
Social media links	x	/	x
Responsive Design	/	x	x

An online booking system needs to support real time booking, provides calendar to display availability for booking and supports multiple payment options to facilitate payment process. Additional features may involve the usage of multiple languages, provides social media links and support responsive design.

2.2 Online Membership Business Model

Membership refers to activities where the customer receives the product periodically or have periodic access to the services by paying a fee [6]. According to [7], membership is where a customer must pay a recurring price at regular intervals for access to a product or service.

One of the elements of membership is discount [7]. Discounts will be given to customer who registered as members. The second element is contests. Contests can occur among limited group of members. The contest is just for fun and to improve relationship between the organization and the customer. Next is the best reward. Reward will be given to members who is loyal to the organization.

The other elements in membership is giving reward to the members such as free gift [8]. This effort can improve customer loyalty. Next element is invite the members to special event. The events will help to increase the bonding between organization and members.

A study conducted by [9] on 150 respondents regarding kind of benefits respondents wish to have if they subscribe to become a member for e-booking points out several findings. Most of the respondents wish to subscribe as a member of e-booking transaction to get discount when purchasing something through the e-commerce site. They can get low price when buying or booking through e-commerce after discount. Free gift and lucky draw are the methods to attract the consumer interest to become a member of e-booking transaction. Membership can strengthen relationship between organization and the customer upon perceive value the customer received.

A number of studies have focused on the positive relationship between perceived value and client behavior intentions [10]. [11] declare that perceived value is the most determinant

factor for a client to re-purchase a product. In the case of studies conducted at fitness centers, although there are studies that have not positively relate these variables [12], most studies confirm a positive and direct relationship between perceived value and future intentions in public fitness centers [13] [14] and private fitness centers [15]. If a client is satisfied, it is more likely that the services or product will be repurchased or reused [16].

2.3 Related Existing System

The purpose of analyzing similar existing system is to gather information that is potentially useful for the development process. Table 2 outlines characteristics included in the existing systems and several suitable characteristics are selected to be integrated in the proposed system.

Table 2: Summary of Features Used in the Existing Systems

Characteristics	Kfit.com	Ministry ofburn.com	Fushion fitnessyoga.com
Similar Existing System			
24-hours accessibility	/	/	/
Online registration	/	/	/
View class and instructor	/	/	/
Choose class	/	/	/
Choose instructor	/	/	/
Mobile Apps	/	x	x
View booking history	/	x	/
Manage booking	/	/	/
Online Booking System Features			
Real-time booking (Johnston, 2017; Tran, 2018; Theuerzeit, n.d)	/	/	/
Multiple payment option (Johnston, 2017; Tran, 2018; Theuerzeit, n.d)	/	/	/
Calendar (Johnston, 2017; Tran, 2018; Theuerzeit, n.d)	/	/	/
Multiple language (Theuerzeit, n.d)	x	x	x
Link with social media (Tran, 2018)	/	/	x
Responsive Design (Johnston, 2017)	/	/	/

3. METHODOLOGY

This project goes through four phases which are System Planning, System Development, System Testing and System Documentation. Figure 3 outlines detail methodology followed to accomplish objectives of the project.

System planning consist of planning activities. In this phase, the title of the proposed system has been finalized. In addition, the current business process and problem statement were identified through interview and survey. The objective of this process is to gain the related information and identify the problems faced by the gym in handling booking.

The objective of this phase is to execute the project plan. During this phase, there are several processes involved which are analysis, design and development. Analysis involve defining user requirements, compare similar features of existing system, researching the suitable theory, find the suitable development model and find the suitable area of interest and domain related to the system. In the design activity, Context Diagram, Data Flow Diagram (DFD), Entity Relationship Diagram (ERD), Site Map, User Interface, Test Plan and Questionnaire were produced. Next, development process includes the development of the system.

PHASES	ACTIVITIES	TECHNIQUE/ SOFTWARE	DELIVERABLES
SYSTEM PLANNING	PLANNING		
	Discussing project title with the supervisor	Brainstorming	Proposed system
	Conduct interview and survey	Interview and survey	Current business process & problem statement
	Write report	Microsoft Word	Chapter 1
SYSTEM DEVELOPMENT	ANALYSIS		
	Compare similar features of existing system	Researching features used by existing system	Features to be included in the proposed system
	Find suitable theory	Researching suitable theory	Online Membership theory
	Find suitable development model	Researching suitable development model	Adapted Waterfall Model
	Find suitable area of interest and domain	Researching suitable Area of Interest and domain	AOI-Management Information System Domain- Online Booking System
	Define user requirements	Interview	User requirements
	Write report	Microsoft Word	Chapter 2
	DESIGN		
	Design Context Diagram	Start UML Microsoft Power Point	Context Diagram
	Design Data Flow Diagram		Data Flow Diagram
	Design Entity Relationship Diagram		Entity Relationship Diagram
	Design Site Map		Site Map
	Design User Interface		User Interface
Design Test Plan	Test Plan		
Design Questionnaire		Expert & User Questionnaire	
Write report	Microsoft Word	Chapter 3	
DEVELOPMENT			
Develop an Online Gym Booking System (OGBS)	Sublime Amps server PHPMyAdmin	A complete system of OGBS	
SYSTEM TESTING	TESTING AND EVALUATION		
	Conduct System and Testine	Test plan	Functionality and Usability result
	Conduct Expert and User Testing	Questionnaire	
Write report	Microsoft Word	Chapter 4	
SYSTEM DOCUMENTATION	DOCUMENTATION		
	Writing project report	Microsoft Word	A complete report of OGBS

Figure 3: Methodology

System Testing phase is very important to ensure that Online Gym Booking System (OGBS) fulfils user requirements. The system initially was tested by the developer and test plan for customer, staff and manager are used to record findings. Moreover, user evaluation is also included in this phase which consists of expert user and other user evaluation.

Documentation is the last phase where all the activities or important information are gathered and documented. A full report of Online Gym Booking System(OGBS) is documented

in this phase. This is to ensure that all the important information is not missing and easy for the developer to track down if there are any mistake that need to be improved later.

4. RESULT AND DISCUSSION

4.1 System Development

OGBS has been developed to be used by three main users which are customer, staff and manager. Each type of user is provided access to different functions. Table 3 outlines system functions accessible for the user.

Table 3: System Functions by User

User	Functionalities
Customer	<ul style="list-style-type: none"> Register as members View the class and personal trainer schedule availability View package Make booking
Staff	<ul style="list-style-type: none"> View customer's booking details Update package Update class and personal trainer availability Manage personal trainer information
Manager	<ul style="list-style-type: none"> View the sales report View customer's record View booking record View the availability of the class and personal trainer View the personal trainer record View package record Add new staff details

Figure 4 until Figure 7 display screenshots from the OGBS. The customer access class availability schedule, select desired class or package and checkout. Additionally, the customer can view the booking history that they have made by clicking the button 'Reserved Classes', 'My Package' and 'My Trainer'.

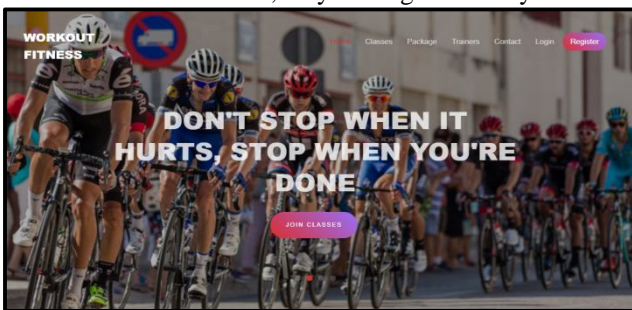


Figure 4: Homepage of OGBS

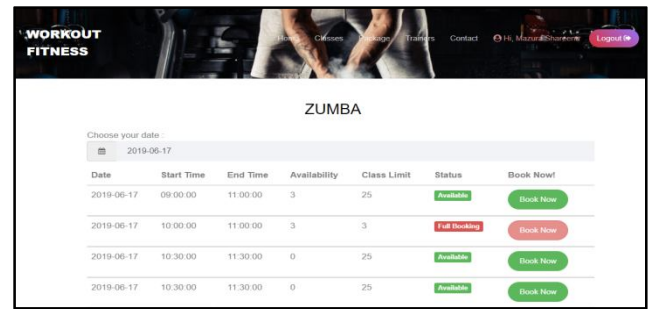


Figure 5: Check for Class Availability

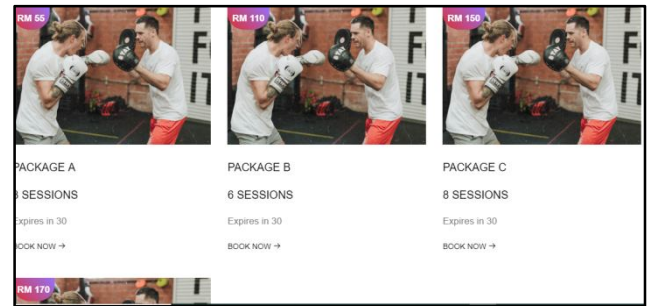


Figure 6: List of the Package

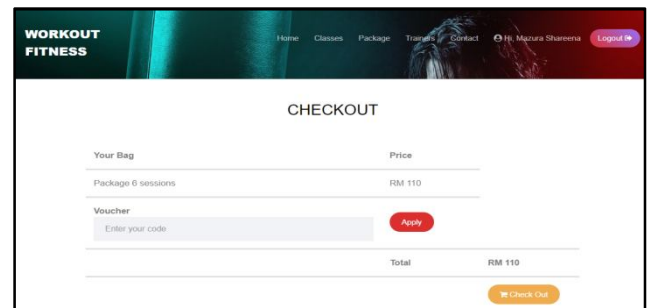


Figure 7: Checkout Page

OGBS was developed by implementing online membership model. In order to proceed with booking the customer needs to register as a member. The members can either book for individual classes/personal trainer or select package which will contribute to cheaper prices. Voucher are also available for the first timer and for customer who are celebrating their birthday on certain date. Members can view history of their activities in the gym as well as monitor their progress through member's dashboard. Figure 8 shows online membership elements in the OGBS.

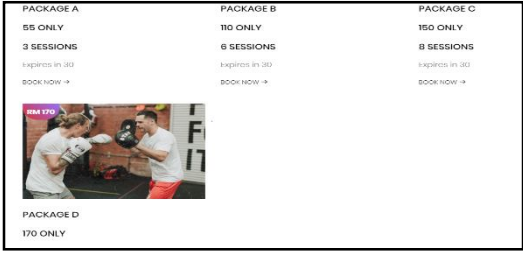
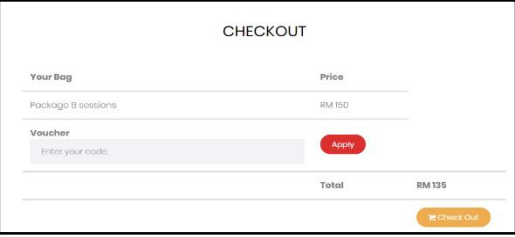

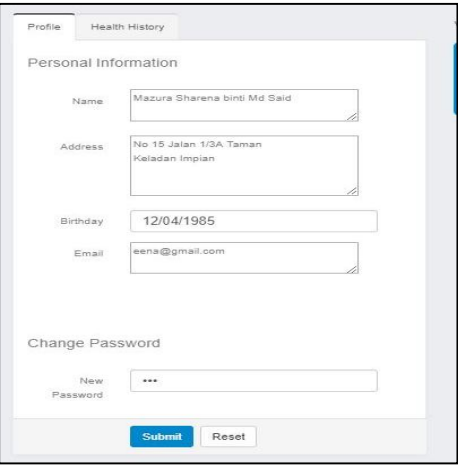
Element	Development of OGBS															
Discount	<p>Member can enjoy cheaper price or discount when booking package</p> 															
	<p>Member can use voucher coupon during checkout. Original price will be deducted.</p> 															
Reward	<p>Member can view history of joined classes and personal trainer.</p>  <table border="1"> <thead> <tr> <th>Booking Date</th> <th>Class Name</th> <th>Class Date</th> <th>Session Start</th> <th>Session End</th> </tr> </thead> <tbody> <tr> <td>2019-05-09</td> <td>Zumba</td> <td>2019-06-19</td> <td>08:00:00</td> <td>09:00:00</td> </tr> <tr> <td>2019-06-17</td> <td>Zumba</td> <td>2019-06-19</td> <td>10:00:00</td> <td>11:00:00</td> </tr> </tbody> </table>	Booking Date	Class Name	Class Date	Session Start	Session End	2019-05-09	Zumba	2019-06-19	08:00:00	09:00:00	2019-06-17	Zumba	2019-06-19	10:00:00	11:00:00
	Booking Date	Class Name	Class Date	Session Start	Session End											
2019-05-09	Zumba	2019-06-19	08:00:00	09:00:00												
2019-06-17	Zumba	2019-06-19	10:00:00	11:00:00												
Member Dashboard	<p>Member can manage profile and view progress.</p> 															

Figure 8: Online Membership Elements Adapted

4.2 System Testing and Evaluation

System testing was done by the developer to validate the functionality of the overall system. Test plan was used to record findings. System usability then was evaluated by two type of users namely expert and other potential users.

Two experts have validated the system usability and provide inputs for further enhancement. Figure 9 and 10 show sample testing result from the experts for two constructs, satisfaction and online membership business model.

No	Description	Result (YES/NO)
1	In your opinion, do the system works properly.	YES (Expert 1) YES (Expert 2)
2	Do you think that the system is pleasant to be used?	YES (Expert 1) YES (Expert 2)
3	Overall, are you satisfied with the system?	YES (Expert 1) YES (Expert 2)
Comment		Suggestion
<ul style="list-style-type: none"> Improve the user friendliness of the system as per discussed. (Expert 1) Ok (Expert 2) 		-

Figure 9: Expert Evaluation Result for Satisfaction Construct

No	Description	Result (YES/NO)
1	In your opinion, do you think online membership elements included in the system is enough and appropriate?	YES (Expert 1) YES (Expert 2)
2	Do you think online membership elements included in the system are beneficial to the members?	YES (Expert 1) YES (Expert 2)
3	Overall, do you find the implementation of online membership elements in the system are satisfying?	YES (Expert 1) YES (Expert 2)
Comment		Suggestion
<ul style="list-style-type: none"> Ok, but make some improvement as suggested. (Expert 1) Ok, good. (Expert 2) 		To have a due date for voucher coupon. So that the user cannot use it when exceed the given date /time (Expert 1)

Figure 10: Expert Evaluation Result for Online Membership Business Model Construct

For user evaluation, 30 respondents have evaluated the system usability. Findings were recorded using a set of questionnaire. Overall, all means are above 4. It indicates most of the respondents are satisfied with the usability of the system. Figure 11 shows the graph for overall user evaluation for six constructs which are user interface, learnability, usefulness, satisfaction, consistency and online membership business model.

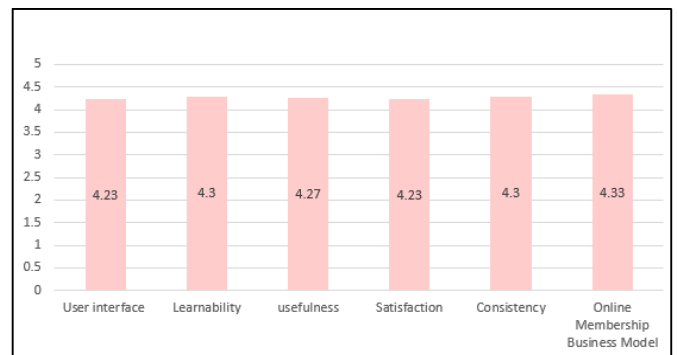


Figure 11: Graph for User Evaluation Overall Result

Table 4 shows each item used in evaluating online membership model element implemented in OGBS. The highest mean recorded is for item F1.

Table 4: Online Membership Business Model Construct

SECTION F: Online Membership Business Model			
Item	Questions	Mean	SD
F1	I can register as a member online	4.87	0.35
F2	I get special price for packages	4.10	0.31
F3	I get discounts when using vouchers	4.43	0.50
F4	I can use the voucher code	4.47	0.51
F5	Overall, I am satisfied with the special offers provided in the system	4.33	0.55

5. CONCLUSION

As a conclusion, Online Gym Booking System (OGBS) has improved current business process and solved all issues stated in the problem statement. OGBS, a booking system for gymnasium service is still in its early stage. The reason for the development is to facilitate the stakeholders in booking process. The problems faced in current business process involving hassle manual booking process has been the driving force to the OGBS proposal. The evaluation results have provided positive indicator to enhance the booking system in the near future.

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