International Journal of Advance Research in Science and Engineering
Vol. No.5, Issue No. 04, April 2016
www.ijarse.com
IJARSE
ISSN 2319 - 8354

A BRIEF STUDY AND IMPLEMENTATION OF VISITOR MANAGEMENT SYSTEM FOR ASIA PACIFIC UNIVERSITY, MALAYSIA

HaiyaHamood Al Ghaithi[1], Umapathy Eaganathan[2]

[1]*Student BSc (Hons) in BIS, Asia Pacific University, Kuala Lumpur, (Malaysia)*

[2]*Faculty in Computing, Asia Pacific University, Kuala Lumpur, (Malaysia)*

ABSTRACT

In this competitive technology world the impact of IT contributes major role in all real time systems. Various management systems implemented for achieving the business organization towards profit, standards, and further business enhancement. The main aim of this research is implemented a web based system that can secure the studentsthat are staying under the university accommodation. This system is a well-structured system and easy to use also provide simple way to accommodate international students giving that more than 70% of students studying there are international. The languages used to develop this system are C# and scripting language is HTML and the database is MySQL. The structural design for this system used Microsoft Visio. Authors of this paper used two types of data gathering techniques which are questionnaire and interview. Nowadays most of the universities follows the manual system and still some of the standard universities follows automated system for students accommodation. The special features of this system are allow users to generate report of visitors, view notification list, generate instant messaging to the visitors, allocate parking and easy payment methods. In future this system will help the management to provide easy accommodation.

Keywords: *Analysis, Domain Research, Implementation, Testing, Technical research.*

I. INTRODUCTION

Universities are tapping into the rich potentials of globalization seeking for talents all over the globe. Statistics has shown, that most people travel for studies in current era for both cross cultural and knowledge exchange than two decades ago. Today, most universities have exchange programs with other university for both short and long periods. Students and lecturers alike are involved in these processes. With this, Accommodation Management System has become one of the major areas of concern in all universities of today. This is because universities have to manage the accommodation of students and lectures that come for short-term or long-term studies. Also, they have to be certain about the security and wellbeing of their students especially being in foreign land as internationals.

1.1 Problem Statement

Managing visitors at student's accommodations is one of the major problems faced by the APU administration that deals with student's visitors' accommodation. Present system of working by the security management is

that the security staff at the guard houses of these APU students accommodation, visitors come and provide identity proof and then they provide unit and block number which they wish to visit. The security guard at the guard house will call the student of the unit number given by the visitor then the student resident will acknowledge that the visitor at the guard house is his visitor, once the resident has been acknowledged the security guard shall allow the visitor to enter the accommodation.

Visitor management at the APU student right now is manual which consumes a lot of time of the visitors who need to wait for the security guard to call the APU student to acknowledge he has a visitor. All this is time consuming more so when there is a rush of visitors at the guard house. For the student resident it is more discomfort when there is a get together of friends since for each visitor he has to attend phone calls from the guard house which leads to consume much of his party time attending calls.

On the other hand, from the management point of view it is difficult to deal with visitors during rush hours with the manual system of working making the visitors to wait in long queues. Management for tracking visitors unit-wise need to check the records manually which consumes a lot of time and might also led to inaccuracy in information collected for such purpose. Some of the problems faced are the difficulty in managing visitors across multiple locations/sites(Morrissey, 2015) since then, APU accommodation needs to be controlled all over one specific website in order to manage and secure the individuals visiting APU students at their homes, therefore it will also help APU to maintain and have over control over visitors and also help secure their students in case any issue occurs.

Another problem is that most of the condominiums are yet still dealing with inaccurate manual systems(Morrissey, 2015) so the visitors management system will allow efficient feedback on individual visitors along with accurate location and all the information needed to maintain security active for the students in the accommodation. Problem is each impact (e.g. Economic, social, psychological, biophysical, cultural, ecological) has a different carrying capacity equation which is not integrated, making the decision to use these difficult for management. Extensive research into environmental and social impacts has failed to establish links between different levels of use and their impacts, and the model is considered too simplistic to be useful (McArthur, 2000). The effective monitoring of resource and social indicators provides the feedback and documentation needed to implement meaningful management action. (Drumm, Andy and Moore, 2005).

1.2 Aims& Objectives

To analyze, design and implement a web based system for Asia Pacific University, Kuala Lumpur, Malaysia.

- To provide student's safety and monitoring.
- To allow the students to upload their personal details.
- To provide easy access of searching and navigation.
- To generate overall reports.
- To send notifications for the users
- To generate SMS alert and instant mailing and messaging.

II. LITERATURE REVIEW

2.1 Domain Research

Organizations need to take care of security measures concerning visitors management and tracking. Corporate offices will get too many number of visitors every day for many reasons such as interviews, parcel deliveries. By introducing a visitor management system that allows organizations to track visitors on daily basis by introducing procedures such as ID registration, visitor approvals , process management , pass or badge and record keeping.

2.1.1 History

Since September 11, 2001, many companies and government agencies enhanced building security by including access control and documenting visitors. The most defining event illustrating the need to enhance school security worldwide occurred in Beslan, Russia on September 1, 2004. A group of mostly Chechen terrorists took over a school and held more than 1,100 hostages for three days until Russian security forces stormed the building. A severe firefight ensued and ultimately over 350 people died, including 184 children. Shortly afterwards, Deputy Secretary of Education Eugene W. Hickok issued a policy letter to all U.S. schools listing "a closed campus approach to limit visitors" as one effective measure of enhancing school security. Since then, several new computerized visitor management systems have been introduced to meet this need (Hagan, 2012).

2.1.2 Computer Visitor Management

In addition to physical barriers limiting school access to one point, schools have discovered the need to improve their process for recording who is entering and exiting the facility. The basic clipboard method is limiting because it is slow and provides little information other than name and time.Several computer based systems are available that provide a wealth of information to enhance both security and front office efficiency. Many systems have a kiosk type environment where a visitor essentially checks himself in much like the clipboard method, but the system has the ability to record much more information quickly. This additional information can include a photo of the visitor, the reason he is there, to what location he is going, a time stamp, and more (Hagan, 2012).

2.2 Technical Research

Technical research involves study on similar system to know the functionality features of the existing system, this is to find the flaws in the existing systems and to take note and suggest good features.

2.2.1 Similar Systems

Visitor Management Software is working system that allow the visitor to call the inmates from the gate requires someone to answer from inside the house. Visitor Management Software is the outcome of motivation that has come out of the drawbacks or loopholes of the present system of working. Visitor management system (VMS) is developed using the trends in information technology which provides a feature to capture visitor information by using identification proof of the visitor and save them to a database that is centralized (Spectra, 2015) shown in Fig.1.

Fig.1 VMS Source

Fig.2 Lobby Guard System

Lobby guard Kiosk system has helped the school organization in savings its time at the same time the student's safety is not at risk. The above Fig.2 shown the lobby guard system for school visitors. Functionality provided by the system has helped the organizations in saving the time of its employees otherwise they had to attend to the visitor at the entrance whenever a new visitor arrives. The organization is exited with the features offered by the system since it saved employees time and takes care of the student's safety(LobbyGuard , 2013).

Installation of the system creates an impression to the visitor that safety is the top priority for the organization. The system takes care of the sign-in process which is streamlined by powerful solutions offered by the system. The system tracks every visitor who enters the school premises. Sing-in and sign-out process is tracked by the system with other details such as whom has the visitor come to meet with reason for the visit(LobbyGuard , 2013).

Happy Visitor Management system manages all the activities that are involved in managing a visitor Fig.3, the system developed using cloud computing. The main idea of the system is to make the visitor an easy activity making it a trouble free visit (Happy visitor, 2014).

International Journal of Advance Research in Science and Engineering
Vol. No.5, Issue No. 04, April 2016
www.ijarse.com
IJARSE
ISSN 2319 - 8354

Fig.3 Happy Visitor System

III. PROPOSED METHODOLOGY

3.1 Methodology Chosen Rational Unified Process (Rup)

Rational Unified Process methodology is chosen for implementing in the development process for Visitors Management System for APU Accommodation. It is a software engineering process used in project management. It is widely used development technology. It is a disciplined approach to managing tasks and responsibilities in a development organization. Rational Unified Process methodology is a web-enabled object oriented development methodology shown in Fig.4. RUP provided guidelines and templates online for all aspects of program development. Rational Unified Process is suitable for a wide range of organizations and projects since it captures best practices of software development in a form that is suitable or a wide variety of projects(Rouse, 2006). RUP suits small and large development teams RUP is a software development methodology from IBM. It provides a disciplined approach to software development process. RUP divides development process into four stages such as analysis and design, implementation, testing and deployment; each phase is organized into separate iterations which should satisfy before going to the next phase of development. Rational Unified Process provides a structured way of to create software programs, it also helps prevent resources from wasting and reduces unexpected development costs(Anwar, 2014).

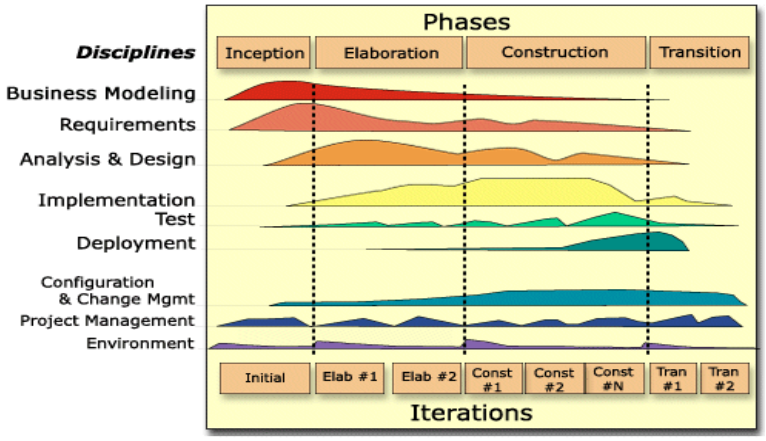

Fig.4 RUP Phases

3.1.1 Inception Phase: During this phase the satisfying the stake holders with regarding to objectives and funding of the project is taken care by taking various steps that takes the form of establishing the scope of the project with a high level requirement which will start by development of a user interface. In this phase work environment is installed and the process is tailored for the team members. During this phase a high level plan regarding the project development life cycle is drawn along with the milestones by using a Gantt chart with the activities on one side with the start date and end date for each activity (Ambler, 2000).

3.1.2 Elaboration Phase: In this phase requirements are detailed to an extent that to prove and decide on the architecture for the proposed system. Requirements of the project are detailed to such an extent that understanding of architectural risks and the scope is realized for further planning. At the end of elaboration phase a Lifecycle architecture milestone is reviewed for the stakeholder will come to know the state of the project and they should agree to the vision of the project which has been stabilized during this phase, that the requirements of the project are finalized, that the architecture designed is stable and satisfied to meet the requirements, risks are continuing but can be managed, expenditure is acceptable and the future estimates are done for the costs and schedules (Rational, 1998).

3.1.3 Construction Phase: During the construction phase system implementation is done to the level of deployment. Focus of the developers is on the deciding the priority of requirements and completing the specifications, analyzing them, plan to provide solution to those specifications, write code and test the software that is developed. User feedback is taken by deploying the earlier versions of the system implemented. Will hold an Initial Operational Capability for the stake holder to assess the status of the project to decide whether the software and the documentation that is developed and written is acceptable for deployment, stakeholders are ready for the deployment, risks are still there and manageable, current expenditure are acceptable and estimates have been done for future costs and schedules, iteration plans are drawn for the next few transition iterations and the project plan is in place (Rational , 1998).

3.1.4 Transition Phase: Transition phase involves delivering the system into production in which the system will be tested by both testing team and the end users. During this phase any errors found is corrected and a fine tuning of the system functioning is done. Training of the end users who are going to use this system will be done with supporting documents such as user manuals. End of this phase is the project review (PR) milestone by the stakeholders to assess the status of the project.

IV. SYSTEM DESIGN

System architecture gives a detailed specification of the requirements that provides developers with a detailed picture of the objectives of the system development. Software System architecture comprises of components and the interactions that takes place between these components.

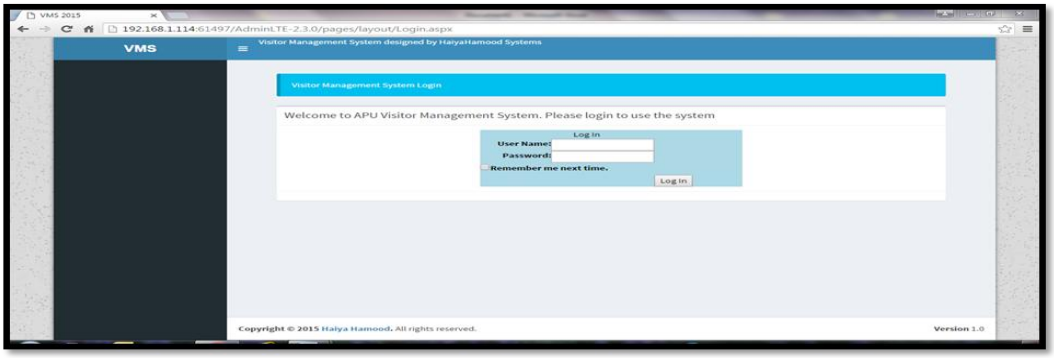

Fig.5 Login Screen

This is the first page when users of this system type in the URL for the system. This page is responsible to filter out users and non-users of this system by validating the login credentials that the users type in as shown above in Fig.5. When the right credentials are typed in, the user is granted access into the system and when the wrong credentials are type in, the users are prompted to correct their credentials.

V. SOFTWARE CHOSEN

5.1 Asp.Net

Forimplementationofdynamicinteractivewebpagesfor**VisitorManagementSystemforAPU Accommodation** C# language will be used for implementation of interactive dynamic webpages.C#comes along with Microsoft's Windows Operating System but developerscan alsoget the open source compiler and related files fromMicrosoftofficialwebsites(www.microsoft.com).

5.2 Ide Visual Studio

Anintegrateddevelopmentenvironmentisrequiredtowritethecode,debugthecodeandexecute the codes for which Visual Studio will be used. Code will written using the work space that is providedbyVisual Studioandthenthecodeisdebugged.Thedevelopedcodewillbeplacedina folder with files having extension as .ASPX and then the code folder is configured to run locally in system by adding it to IIS websites.

5.3 Database Management System Chosen

For storing data and retrieval on demand a database management mysql is chosen. It is the most popular dbms that is widely used with php for web based system. Dbms short for database management system. Plays a major role in most real-world projects that require storing, retrieving, and querying digital data. For instance, dynamic websites, accounting information systems, payroll systems, stock management systems all rely on internal databases as a container to store and manage their data (jeffrey a. Hoffer, maryprescott, heikki topi,2008) for storing and arranging data of the project a database management system is required for which a relational database management system mysql is chosen.

VI. TESTING

Unit testing is called the first level of testing that used in software testing. This testing is to test the different modules during the design of modules and it is combination of set of test that every individual programmer integrating the units into a huge system. This unit testing first mainly focus on the modules of the system to locate errors. In this errors are verified and corrected to that unit perfectly fits to the project(Software Testing Help, 2015).Unit testing is done for the student upload visitor information, once the developer finds that this unit of code to provide the functionality of uploading visitor information is working successfully then they test the other code to edit the visitor details to test the edit function. The following Table 1 shown the way of unit testing for login.

Test No.	Username	Password	Actual Output	Expected Output
1	Wrong Username	Wrong Password	Invalid Username and Password	Show error message
2	Wrong Username	Right Password	Invalid Username	Show error message
3	Right Username	Wrong Password	Invalid Password	Show error message
4	Right Username	Right Password	Login Successful	Success

Table 1. Unit Testing

6.1 Module Testing:

Module testing is done once the units of codes are tested separately for their successful functioning. During module testing two units of codes are testing to find whether the code in one unit is working in conjunction with the other unit of code successfully (Target, 2015). For the visitor management system when the code for uploading visitor information is working, then the code for search function to search for the uploaded visitor information is tested, this way module testing is done by testing units of code with each other.

6.2 User Acceptance Test:

This test takes during the transition phase of the RUP methodology where the system that is testing by the developers will be deployed at user-domain and the users are exposed to testing. User acceptance testing is the most crucial testing of all the testing in the software development. Only when the user testing is successful that is if the system meets the requirements as expected the system is deployed finally for actual use in the real world scenario. Here for the proposed visitor management system the users are security guard, student and the administrators who will test the system for its working based on the requirement specifications.

VII. FEATURES OF THE SYSTEM

Proposed system for Visitors Management System for APU Accommodation will be an online system that can run on the internet using a browser. The system has three main users administrator of the APU accommodation management, security guards and the students who are the residents. All the three users will be able to access the system using login credentials provided and perform actions that are implemented. Below given are the

main functionalities that will be delivered to the user based on the module they belong to that is student, administrator and security guard.

- Allow administrator to login to the system and add students and security staff.
- Allow students to add/edit/delete visitor's coming over to their accommodation.
- Allow security guard to view the visitor's information on arrival at the guard house.
- Allow the security guard to view notification list whenever a student uploads visitor details
- Allow admin to view the overall process of the students having visitor's
- Allow all the users to change their password for security reasons

VIII. CONCLUSION

The developer faced challenges mainly at the beginning of the project since a lot had to be learned. This made it extremely difficult for the developer to move through with the development fast. From time to time, half-way through the development, a lot had to be changed after the developer learnt something new from Microsoft Developer Network and StackOverflow. This starting-over happened more than twice and greatly delayed the developer's progress.Another important thing leant by the developer was the use of controls. This is one of the things that the developer enjoyed, especially when through some creativity the developer leant that same controls for adding can be re-used for editing without expending much energy or effort. The developer finally decided to use controls for the whole project, wherever input was collected except in searching since it was implemented before the discovery of controls and it was working well already.All in all the project was a success and both the research and the development addressed the necessary issues and possibly will help eliminate the stated problems. The developer appreciates the efforts of her friends, lecturers and supervisor who helped her in different ways throughout the project.

IX. ACKNOWLEDGMENT

The authors thank to Asia Pacific University, Kuala Lumpur, Malaysia for their support, encouragement. Also authors thank to Dr Jothi Sophia, Principal, CSI JACON, Madurai, India for their constant encouragement.

REFERENCES

[1] Ambler, S. W., 2000. *The Unified Process Inception Phase.* [Online] Available at: http://www.ambysoft.com/books/inceptionPhase.html [Accessed 28 7 2015].

[2] Anwar, A., 2014. A Review of RUP (Rational Unified Process). International Journal of Software Engineering (IJSE), 5(2), pp. 12-19.

[3] Drumm, Andy, and Moore, A. (2005). MANAGING VISITOR IMPACTS. 1st ed. [ebook] pp.4-22.Availableat: http://sanctuaries.noaa.gov/management/international/pdfs/day3_impacts_manual.pdf [Accessed 12 Jun. 2015].

[4] Hagan, R., 2012. New school visitor management technologies help keep school safe. [Online] Available at: http://www.seenmagazine.us/articles/article-

detail/articleid/2010/smid/403/articlecategory/56/new-school-visitor-management-technologies-help-keep-school-safe.aspx [Accessed 8 7 2015].

[5] Happy visitor, 2014. HOW HAPPY VISITOR WORKS. [Online] Available at: http://happy-visitor.in/ [Accessed 7 7 2015].

[6] Happy visitor, 2014. NEED FOR HAPPY VISITOR. [Online] Available at: http://happy-visitor.in/ [Accessed 7 7 2015].

[7] Jeffrey A. Hoffer, Mary Prescott, Heikki Topi, Modern Database Management, 9th ed, Prentice Hall, 2008

[8] LobbyGuard , 2013. home. [Online] Available at: http://lobbyguard.com/ [Accessed 7 7 2015].

[9] Morrissey, P. (2015). The 5 Problems with Manual Visitor Management | Articles. [online] Magic-card.com.au. Available at: http://www.magic-card.com.au/articles/the-5-problems-with-manual-visitor-management.html [Accessed 12 Jun. 2015].

[10] McArthur,S.(2000). Beyond carrying capacity: introducing a model to monitor and manage visitors activity in forests. In:Font. X. AND Tribe,J. (Editors).Forest Tourism and Recreation: Case studies in environmental management. Pp: 259-278. CABI Publishing, New York.

[11] Rational, 1998. Rational Unified Process Best Practices for Software Development Teams. Rational Unified Process: Best Practices for Software development Teams, p. 2.Rational, 2002. Rational Unify Process (RUP), a Software Process Knowledge Base.. [Online] Available at: http://ref.web.cern.ch/ref/CERN/CNL/2002/001/SDT_RUP/[Accessed 25 7 2015].

[12] Rational , 1998. Rational Unified Process. Rational Unified Process: Best Practices for Software development Teams, p. 6.

[13] Rational, 1998. Rational Unified Process. Rational Unified Process: Best Practices for Software development Teams , p. 4.

[14] Software Testing Help, 2015. Types of software Testing. [Online] Available at: http://www.softwaretestinghelp.com/types-of-software-testing/[Accessed 12 8 2015].

[15] Spectra, 2015. Product Brief. [Online] Available at: http://www.spectra-vision.com/visitor-mangement-software/[Accessed 2 7 2015].

[16] Sampada Khot, T. P. R. a. M. R., 2015. Visitor Management System Using GSM. International Journal of Modern Trends in Engineering and Research (IJMTER), 2(4), p. 1.

[17] Target, 2015. Software Module Tests. [Online] Available at: http://www.the-software-experts.com/e_dta-sw-test-unit.php[Accessed 12 8 2015].