



Faculty of Computer Science and Information Technology

***WEB BASED REAL TIME BUS MONITORING AND TRACKING
SYSTEM UNIMAS***

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Bachelor of Computer Science with Honours

(Network Computing)

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UNIMAS**

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This project is submitted in partial fulfilment of the
requirement for the degree of
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**UNIMAS SISTEM PEMANTAUAN DAN PENGESANAN BAS BERDASARKAN
MASA NYATA DALAM WEB**

AMIRA IZZATI SHAHILA BINTI AHMAD RIZAL

Projek ini merupakan salah satu keperluan untuk Ijazah
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ABSTRACT

Public transport buses are used by all walks of life from one place to another. The latest development is the Government's efforts to stimulate public transport to provide the best facilities and services to the public. To fully utilize the bus service provided, a good bus management system is required. In Malaysia, real-time bus tracking is provided only by minority bus service providers that can be found mainly in West Malaysia but is still relatively new in eastern Malaysia. Most service providers only provide inaccurate scheduled in real time. Several Universities in Malaysia have successfully implemented real-time bus tracking systems. Real-time bus tracking systems are very common and widely implemented by many universities abroad. Each semester UNIMAS students have to pay their tuition fees which include transportation and health fees before they begin the semester. This means that by paying a fee, students can take UNIMAS buses provided by the university extensively during the semester. However, UNIMAS bus drivers do not always arrive on time. Students often get tired of waiting for bus stops for buses to arrive but are unable to get the latest bus status. This affects their decision whether to wait for the bus or to find alternatives such as Grab Car services so that they are not late for important events like their exams and classes. UNIMAS buses serve as public transport for students to classes or faculty from the College, whether staying outside or in colleges within UNIMAS.

The project aims to build a websites system where users can track buses, bus routes on the day, estimated bus times to arrive at bus stops and get updates on UNIMAS bus information. The tracking system for UNIMAS buses because students do not have a real platform for detecting UNIMAS buses, and now using manual systems, management sites or MPPs need to post every

semester on the Facebook for the bus schedule but the timetable of bus are fixed as everyday student face problem with delaying bus so long, bus not coming on the time that already put in the time table .Daily compliance issues relate to students being tired using UNIMAS buses and instead of paying for an Uber or Grab car to get to class even at short distances and high costs while UNIMAS bus fees are included in the student fees each semester.

ABSTRAK

Bas ialah pengangkutan awam yang digunakan oleh semua lapisan masyarakat dari satu tempat ke tempat lain. Pembangunan terkini adalah usaha Kerajaan untuk merangsang pengangkutan awam untuk memberikan kemudahan dan perkhidmatan terbaik kepada orang ramai. Untuk menggunakan sepenuhnya perkhidmatan bas yang disediakan, sistem pengurusan bas yang baik diperlukan. Di Malaysia, pengesanan bas masa nyata disediakan hanya oleh pembekal perkhidmatan bas minoriti yang boleh ditemui terutamanya di Malaysia Barat tetapi masih agak baru di Malaysia timur. Kebanyakan penyedia perkhidmatan hanya menyediakan jadual terjadual yang tidak tepat dalam masa nyata. Terdapat beberapa universiti di Malaysia yang telah berjaya melaksanakan sistem pengesanan bas masa nyata. Sistem pengesanan bas masa nyata sangat umum dan dilaksanakan secara meluas oleh banyak universiti di luar negara. Setiap semester pelajar UNIMAS perlu membayar yuran pengajian mereka yang termasuk yuran pengangkutan dan kesihatan sebelum mereka memulakan semester. Ini bermakna dengan membayar yuran, pelajar boleh mengambil bas UNIMAS yang disediakan oleh universiti secara meluas pada setiap semester. Walau bagaimanapun, pemandu bas UNIMAS tidak selalu tiba tepat pada waktunya. Pelajar sering bosan menunggu di perhentian bas untuk bas tiba tetapi tidak dapat mendapatkan status bas terkini. Ini mempengaruhi keputusan mereka sama ada untuk menunggu bas atau mencari alternatif seperti perkhidmatan Grab Car supaya mereka tidak terlambat untuk acara penting seperti peperiksaan dan kelas mereka. Bas UNIMAS berfungsi sebagai pengangkutan awam untuk pelajar ke kelas atau fakulti dari Kolej, sama ada tinggal di luar atau di kolej di dalam UNIMAS.

Projek ini bertujuan untuk membina sistem laman web di mana pengguna boleh mengesan bas, laluan bas pada hari, menganggarkan masa bas tiba di perhentian bas dan mendapatkan maklumat terkini tentang maklumat bas UNIMAS. Sistem pengesanan untuk bas UNIMAS kerana pelajar tidak mempunyai platform nyata untuk mengesan bas UNIMAS, dan sekarang menggunakan sistem manual, Majlis Perwakilan Pelajar atau MPP perlu menyiarkan setiap semester di Facebook untuk jadual bus, tetapi jadual adalah masalah yang dihadapi setiap hari pelajar dengan ketibaan bas yang lambat, bas tidak akan tiba tepat pada waktunya seperti yang tertulis di dalam jadual. Isu pematuhan harian berkaitan dengan pelajar yang penat menggunakan bas UNIMAS dan sebaliknya membayar untuk kereta Uber atau Grab untuk sampai ke kelas walaupun pada jarak pendek dan kos tinggi manakala yuran bas UNIMAS dimasukkan ke dalam yuran pelajar setiap semester.

Chapter 1: Introduction

1.1 Introduction

Effective transportation management is important especially in today's era to increase the quality of our life. Public transportation systems are the main problem, in the way that people move around their community which plays an increasingly important role especially in the student environment. However, most public transportation schedules are unreliable and unpredictable. There are some problems faced by the public transport system, which include frustrated waiting time for the arrival of buses and the difficulty of accessing bus-related information. The focus is to provide such a system to the remote user which will reduce waiting time for the bus and will provide all the necessary details regarding the arrival and departure time of the bus and its real-time location. Thus, effective routing and tracking of a transportation application are needed. This project is focused on developing a website of UNIMAS bus monitoring and tracking system. It provides the user the estimation time for the bus to arrive, the latest bus schedule and the latest information on the bus. All the details information will be key in or set by the Transportation Admins so that, user can get the updated information of the bus, for example, if the bus delay in 30 minutes or if the bus does not operate on the scheduled time due to technical problem on the bus. In Malaysia, real-time bus tracking just started to be provided by some bus service providers which can be found especially in West Malaysia but still a new thing in East Malaysia. Most of the service providers only provide a scheduled timetable which is not accurate in real-time. Some universities in Malaysia successfully implement real-time bus tracking system. Real time bus tracking system is very common and widely implemented by many universities in overseas countries.

1.2 Problem Statement

Team management bus UNIMAS have a problem to communicate with the bus user and also student does not have a real platform for tracking the UNIMAS bus. Besides, currently it is using a manual system, management site or Student Representative Council (MPP) need to post the bus schedule in Facebook on every semester. There seems like no real solutions can be done to overcome this problem. Thus, it may lead to many other negative consequences such as student late to class or examinations. Currently, students rely on printed UNIMAS bus schedules. This affects their decision making, whether to continue to wait for the UNIMAS bus or seek for the alternative such as car fetching service, MyCar or Grab so that they would not late for the important events such as the examination and their classes. The news and notifications from the management site will take quite some time to reach all UNIMAS students. Students could not adjust their schedule plans. Most of the student does not have their private transport. They fully rely on these official transportation services provided. This project is developed to solve the current problematic situations.

1.3 Objectives

1. To develop the monitoring and tracking system for UNIMAS students.
2. To display information on the latest operating bus activity to students such as sudden change of schedule, route or bus breakdown.

1.4 Methodologies

In this project, Rapid Application Development (RAD) has been chosen as a method for development. RAD is an agile software development technique that provides faster development technique, perform optimally and provide better customer engagement compared to traditional model such as the waterfall. It is a method of software development that emphasizes rapid prototyping and iterative delivery. RAD is a software development process target to be done within 60 – 90 days. Also, this model is chosen due to its low cost in the system development yet able to provide a high-quality system. Thus, it is an attractive choice for developers working in a fast-paced environment like software development. In developing this project, the major phases of development are required Analysis and Quick Design, Prototype Cycles, Testing, and Deployment.

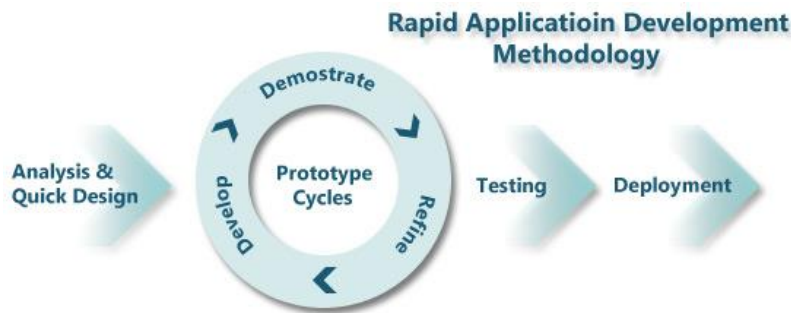


Figure 1.1: Rapid Application Development Model (RAD) (Ramsoft Consulting, 2017)

1.4.1 Analysis and Quick Design

In this phase, the problem faced will be analysed. Besides, objectives, project scope and the requirements of the proposed application will also be identified, so that the future stages with the prototype can be started. The requirements will be gathered from the users and used in the design and development of the application.

1.4.2 Prototype Cycles

A system prototype based on the requirements will be created. Once it is done, demonstration and explanation of the prototype to stakeholders take place. Any improvement will be done until the stakeholders are satisfied after getting the feedback.

1.4.3 Testing

Testing of the function in the application will be done to ensure it is functioning as desired once the prototype is done. All requirements need to be made sure that they are achieved in this phase.

1.4.4 Deployment

The Deployment phase is the last in RAD. The activities of functional testing and system testing are included in this stage. These development activities will be explained deeper in Chapter 4 and Chapter 5. The finished product will be launched after the implementation is done.

1.5 Scope

The scopes of this project are:

- The target user of these systems is students in UNIMAS.
- The systems will show the estimated arrival time of the bus to the location of the users.
- Admin needs to update to allow students to keep track of the bus information.
- Involved only UNIMAS buses.

1.6 Significant of Project

This project consists of three types of users which is UNIMAS student, admin and bus driver .The bus driver needs to log in into the system and turn the location of their mobile phone. Using this method, we do not need to put a GPS tracker on the bus and can save costs for the project. Students can be able to see all the buses that will arrive at their location with the estimated arrival time.

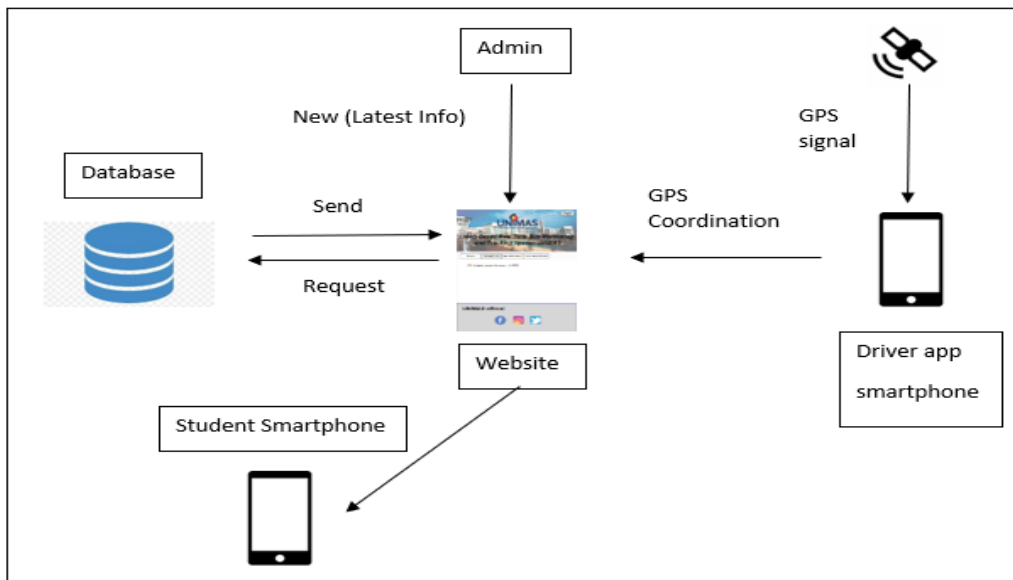


Figure 1.2: Architecture of Web Based Real Time Bus Monitoring and Tracking System

1.7 Project Schedule

The project schedule of this proposed project is shown in the form of a Gantt Chart.

	Task Name	Duration	Start	Finish
1	Project Schedule Final Year Project	81 days	Sun 29/9/19	Sat 11/1/20
2	Final Project 1	81 days	Sun 29/9/19	Sat 11/1/20
3	Prepare Brief Project Description	2 days	Sun 29/9/19	Mon 30/9/19
4	Submit Brief Project Description	6 days	Tue 1/10/19	Mon 7/10/19
5	Feedback and Comment from Reviewers	1 day	Tue 8/10/19	Tue 8/10/19
6	Project Proposal	12 days	Sat 5/10/19	Sat 19/10/19
7	Prepare full Research Proposal	12 days	Sat 5/10/19	Sat 19/10/19
8	Milestones: Submit Full Proposal	0 days	Sat 19/10/19	Sat 19/10/19
9	Chapter 1: Introduction	7 days	Sat 19/10/19	Sat 26/10/19
10	Finalize Project Proposal	7 days	Sat 19/10/19	Sat 26/10/19
11	Milestones: Submit Chapter1 Report	0 days	Sat 26/10/19	Sat 26/10/19
12	Chapter2: Background/Literature Review	17 days	Sat 26/10/19	Sat 16/11/19
13	Review on Article of Related Topic	8 days	Sat 26/10/19	Tue 5/11/19
14	Documentation	10 days	Tue 5/11/19	Sat 16/11/19
15	Milestones: Submit Chapter2 Report	1 day	Sat 16/11/19	Sat 16/11/19
16	Chapter3: Methodology/Requirement Analysis and Design	15 days	Sat 16/11/19	Thu 5/12/19
17	Define Requirement Analysis and Design	15 days	Sat 16/11/19	Thu 5/12/19
18	Milestones: Submit Chapter3 Report	0 days	Thu 5/12/19	Thu 5/12/19
19	Submission of FYP 1 Final report	1 day	Thu 12/12/19	Thu 12/12/19
20	Final Year Project1 Symposium	2 days	Tue 17/12/19	Wed 18/12/19
21	Amendment and Modification Period for FYP	14 days	Fri 20/12/19	Wed 8/1/20
22	Submission of Final Report (Softcopy)	0 days	Sat 11/1/20	Sat 11/1/20

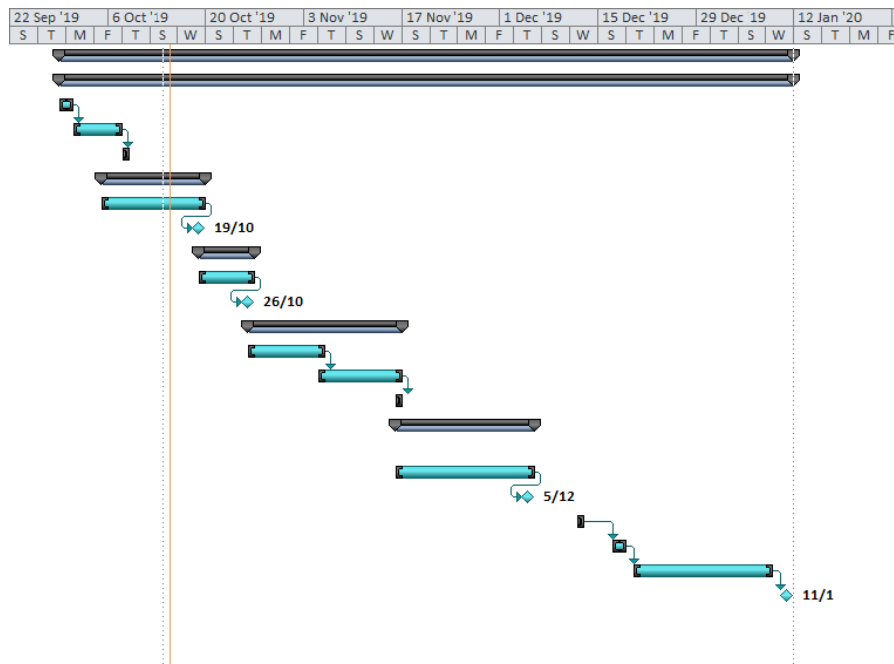


Figure 1.3: Project Schedule for Final Year Project 1