Anuruddha Perera Computing Research Project Assingment

software project proposal (ESOFT Metro Campus)

Internal verification of assessment decisions – BTEC (RQF)

INTERNAL VERIFICATION – ASSESSMENT DECISIONS			
Programme title	BTEC Higher National Diploma in Computing		
Assessor		**Internal Verifier**	
Unit(s)	Unit 13: Computing Research Project		
Assignment title	Final Research		
Student's name	Anuruddha Perera		
List which assessment criteria the Assessor has awarded.	**Pass**	**Merit**	**Distinction**

INTERNAL VERIFIER CHECKLIST		
Do the assessment criteria awarded match those shown in the assignment brief?	Y/N	
Is the Pass/Merit/Distinction grade awarded justified by the assessor's comments on the student work?	Y/N	
Has the work been assessed accurately?	Y/N	
Is the feedback to the student: Give details:		

• Constructive? • Linked to relevant assessment criteria? • Identifying opportunities for improved performance? • Agreeing actions?	Y/ N Y/ N Y/ N Y/ N			
Does the assessment decision need amend?	Y/N			
Assessor signature			**Date**	
Internal Verifier signature			**Date**	
Programme Leader signature (if required)			**Date**	

Confirm actioncompleted			
Remedial action taken			
Internal Verifier		**Date**	
Programme Leader signature (if		**Date**	

Higher Nationals - Summative Assignment Feedback Form

Student Name/ID	Anuruddha Perera		
Unit Title	Final Research		
Assignment Number		**Assessor**	
Submission Date	10.05.2020	**Date Received 1st**	
Re-submission Date	17.05.2020	**Date Received 2nd submission**	

Assessor Feedback:

LO1 Examine appropriate research methodologies and approaches as part of the research process ☐

Pass, Merit & Distinction Descripts	**P1** ☐	**P2** ☐	**M1**	**D1** ☐

Grade:	**Assessor Signature:**	**Date:**

Resubmission Feedback:

Grade:	**Assessor Signature:**	**Date:**

Internal Verifier's Comments:

Signature & Date:

* Please note that grade decisions are provisional. They are only confirmed once internal and external moderation has taken place and grades decisions have been agreed at the assessment board.

Assignment Feedback

Formative Feedback: Assessor to Student
Action Plan
Summative feedback

Feedback: Student to Assessor			
Assessor signature		**Date**	
Student signature		**Date**	

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Higher Nationals in

Computing

Unit 13: Computing Research Project

Project Proposal

General Guidelines

1. A Cover page or title page – You should always attach a title page to your assignment. Use previous page as your cover sheet and be sure to fill the details correctly.
2. This entire brief should be attached in first before you start answering.
3. All the assignments should prepare using word processing software.
4. All the assignments should print in A4 sized paper, and make sure to only use one side printing.

5. Allow 1” margin on each side of the paper. But on the left side you will need to leave room for binging.

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1. Use a font type that will make easy for your examiner to read. The font size should be **12** point, and should be in the style of **Time New Roman**.
2. **Use 1.5 line word-processing**. Left justify all paragraphs.
3. Ensure that all headings are consistent in terms of size and font style.
4. Use **footer function on the word processor to insert Your Name, Subject, Assignment No, and Page Number on each pag**e. This is useful if individual sheets become detached for any reason.
5. Use word processing application spell check and grammar check function to help edit your assignment.

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2. Ensure that you give yourself enough time to complete the assignment by the due date.
3. Don’t leave things such as printing to the last minute – excuses of this nature will not be accepted for failure to hand in the work on time.
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5. If you are unable to hand in your assignment on time and have valid reasons such as illness, you may apply (in writing) for an extension.
6. Failure to achieve at least a PASS grade will result in a REFERRAL grade being given.

7. Non-submission of work without valid reasons will lead to an automatic REFERRAL. You will then be asked to complete an alternative assignment.
8. Take great care that if you use other people's work or ideas in your assignment, you properly reference them, using the HARVARD referencing system, in you text and any bibliography, otherwise you may be guilty of plagiarism.
9. If you are caught plagiarising you could have your grade reduced to A REFERRAL or at worst you could be excluded from the course.

Student Declaration

I hereby, declare that I know what plagiarism entails, namely to use another's work and to present it as my own without attributing the sources in the correct way. I further understand what it means to copy another's work.

1. I know that plagiarism is a punishable offence because it constitutes theft.
2. I understand the plagiarism and copying policy of the Edexcel UK.
3. I know what the consequences will be if I plagiaries or copy another's work in any of the assignments for this program.
4. I declare therefore that all work presented by me for every aspects of my program, will be my own, and where I have made use of another's work, I will attribute the source in the correct way.

5. I acknowledge that the attachment of this document signed or not, constitutes a binding agreement between myself and Edexcel UK.
6. I understand that my assignment will not be considered as submitted if this document is not attached to the attached.

Student's Signature: anuruddhaperera.cs@gmail.com

Date:31.08.2020

(*Provide Submission Date*

(*Provide E-mail ID*)

Assignment Brief

Student Name /ID Number	Anuruddha Perera
Unit Number and Title	Unit 13 – Computing Research Project
Academic Year	2017/18
Unit Tutor	
Assignment Title	**Final Research Project Proposal**
Issue Date	10/05/2020
Submission Date	10/05/2020
IV Name & Date	

Submission Format:

The submission is in the form of an individual written report. This should be written in a concise, formal business style using single spacing and font size 12. You are required to make use of headings, paragraphs and subsections as appropriate, and all work must be supported with research and referenced using the Harvard referencing system. Please also provide a bibliography using the Harvard referencing system.

Research Project Proposal - Please provide a referencing list using the Harvard referencing system. The recommended word limit is minimum 2000 words.

Unit Learning Outcomes:

LO1. Examine appropriate research methodologies and approaches as part of the research process.

Assignment Brief and Guidance:

Artificial Intelligence (AI)

Artificial intelligence (AI), sometimes called machine intelligence, is intelligence demonstrated by machines, in contrast to the natural intelligence displayed by humans and other animals. Computer science defines AI research as the study of "intelligent agents": any device that perceives its environment and takes actions that maximize its chance of successfully achieving its goals.

Artificial Intelligence covers computer systems which are able to perform tasks normally requiring human intelligence. These tasks might include visual perception, speech recognition, decision-making, and translation between languages and many more.

AI impacts on every aspect of society and has the potential to be fully integrated into daily work and social lives in the very near future.

Learner requires to select a suitable area from the areas given below to conduct a research and further, needs to develop appropriate Topic, Research Questions and Research Objectives.

- How does AI aid the in-depth exploration of an environment or system?
- What role may AI play in generating content for big brand products and services?
- How does AI and machine learning contribute to the innovative use of technology e.g. robotics, automotive transportation?
- What impact will the future influences of AI have in our daily lives?

……
…….

The Learner requires to produce a research proposal that clearly defines a research question or hypothesis, supported by a literature review (Use the project proposal and ethical consideration form template formats)

Project Proposal should cover following areas;

1. Definition of research problem or question. (This can be stated as a research question, objectives or hypothesis)
2. Provide a literature review giving the background and conceptualization of the proposed area of study. (This would provide existing knowledge and benchmarks by which the data can be judged)
3. Consider and define research methodology and research process. Demonstrate understanding of the pitfalls and limitations of the methods chosen and ethical issues that might arise.
4. Draw points (1–3, above) together into a research proposal by getting agreement with your tutor.

Grading Rubric

Grading Criteria	Achieved	Feedback
P1 Produce a research proposal that clearly defines a research question or hypothesis, supported by a literature review		
P2 Examine appropriate research methods and conduct primary and secondary research.		
M1 Evaluate different research approaches and methodology, and make justifications for the choice of methods selected based on philosophical/ theoretical frameworks.		
D1 Critically evaluate research methodologies and		

processes in application to a computing research project to justify chosen research methods and analysis.		

Research Proposal Form

Student Name : Anuruddha Perera

Centre Name : Esoft Metro Campus Panadura

Date: 11.05.2020

:

Tutor : Ahamed Mubarak
Unit : Unit 13: Computing Research Project
Proposed title : How does AI and machine learning contribute to the innovative use of technology e.g. robotics, automotive transportation?

Section One: Title, objective, responsibilities

Title or working title of research project (in the form of a question, objective or hypothesis):

Research project objectives (e.g. what is the question you want to answer? What do you want to learn how to do? What do you want to find out?):

Working Title: Both AI and machine learning immensely pave the way to derive the maximum benefits towards innovative use of technology e.g.: robotics, automotive transportation. How far do they contribute in achieving the ultimate goals with regard to robotics and automotive technology?

Research project objective (question you want to answer): To determine the effectiveness introducing solution of smart parking system.

Research project objective (what do you want to learn how to do) How artificial intelligence will be helpful to people when using smart parking systems.

Research project objective (what do you want to find out?): Intelligent Parking Management System

Based on Image Processing,

I want to closely observe the modern developed technology on AI in manufacturing cars and aircraft industries. My ultimate objective is to share the knowledge with my friends in manufacturing a luxury car which AI is been used.

I'm very keen to update my knowledge immensely and improve the skills regarding the modern technology of AI.

Importance of smart car parking

Benefits of smart car parking

As an enthusiastic guy who really like to come in life in this topic is very relevant for me.

Section Three: Literature sources searched

Use of key literature sources to support your research question, objective or hypothesis:

How artificial intelligence started and the methodology used in this

Uses in artificial intelligence used in IT nowadays

More depth into robotics and how it is useful in AI

Use of key indexes

References

Section Two: Reasons for choosing this research project

Reasons for choosing the project (e.g. links to other subjects you are studying, personal interest, future plans, knowledge/skills you want to improve, why the topic is important):

The very techniques on AI learning in the subjects prototyping, user interface and user experience.

In our learning process, we learnt the very techniques on AI as far as the subjects such as prototyping and user interface and user experience.

I do have a keen desire to learn the fundamentals in using the delecate techniques on AI with great interest which would really help us when the needs arise in our daily routine.

Section Four: Activities and timescales	
Activities to be carried out during the research project (e.g. research, development, analysis of ideas, writing, data collection, numerical analysis, tutor meetings, production of final outcome, evaluation, writing the report)	How long this will take: 3months
Research about AI Making use of ideas and elaborating them Analyzing articles on AI Taking down notes on them	
Finally writing a full report on the selected topic with the taken question and	

Milestone one: Equip with the required weapons in my armory (knowledge and skills) to launch a th$_{m}$e$_{a}$o$_{s}$b$_{si}$j$_{v}$ec$_{e}$t$_{p}$iv$_{r}$e$_{o}$s$_{je}$w$_{ct}$h$_{i}$i$_{n}$ch$_{th}$a$_{e}$re$_{ne}$li$_{a}$s$_{r}$te$_{f}$d$_{ut}$a$_{u}$b$_{r}$o$_{e.}$ve.

Target date (set by tutor):06.10.2020

Milestone two: To excel in the field of AI in a very big way.

Target date (set by tutor):07.10.2020

Section Four: Research approach and methodologies

Type of research approach and methodologies you are likely to use, and reasons for your choice:

What your areas of research will cover:

Case studies

Case studies usually involve the detailed study of a particular case (a person or small group). Various methods of data collection and analysis are used but this typically includes observation and interviews and may involve consulting other people and personal or public records. The researchers may be interested in a particular phenomenon (e.g. coping with a diagnosis or a move into residential care) and select one or more individuals in the respective situation on whom to base their case study/studies. Case studies have a very narrow focus which results in detailed descriptive data which is unique to the case(s) studied. Nevertheless, it can be useful in clinical settings and may even challenge existing theories and practices in other domains.

Non-participant observation

Research Ethics Approval Form

All students conducting research activity that involves human participants or the use of data collected from human participants are required to gain ethical approval before commencing their research. Please answer all relevant questions and note that your form may be returned if incomplete.

Section 1: Basic Details

Project title: Both AI and machine learning immensely pave the way to derive the maximum benefits towards innovative use of technology e.g.: robotics, automotive transportation. How far do they contribute in achieving the ultimate goals with regard to robotics and automotive technology?

Student name: Anuruddha Perera

Student ID number: PAN/A-004746

Programme: HND IN COMPUTING AND SYSTEMS DEVELOPMENT

School: Esoft Metro Campus Panadura

Intended research start date:06.09.2020

Intended research end date:08.06.2020

Section 2: Project Summary

Please select all research methods that you plan to use as part of your project:

- Interviews:
  No
- Questionnaire

s: Yes

Observations: Yes

Use of Personal Records: No

Data Analysis: Yes

Action Research: Yes

Focus
Groups: No

Other (please specify):

Section 3: Participants

Please answer the following questions, giving full details where necessary.

Will your research involve human participants?

No, it will be conducted by myself.

Section 4: Data Storage and Security

Who are the participants? Tick all that apply:

Confirm that all personal data will be stored and processed in compliance with the Data Protection Act (1998)

Ages 12-16: ☐ Young People aged 17–18: ☐ Adults: ☐

Yes: Yes No:

Who will have access to the data and personal information?

How will participants be recruited (identified and approached)?

By me who is doing the research fully.

During the research:

Where will the data be stored?

Describe the processes you will use to inform participants about what you are doing:

In my personal laptop's hard drive.

Will mobile devices such as USB storage and laptops be used? Yes: Yes No:

If yes, please provide further details:

Setucdtiioens i6n:vDoelvcilnagraqtuioenstionnaires: Will participants be given the option of omitting questions they do not wish to answer?

I'm using my personal laptop to do the following research.

I have read, understood and will abide by the institution's Research and Ethics Policy:

Yes: ☐ No: ☐

Yes: Yes No:

After the research:

I have considered the ethical issues involved in this assignment and have discussed them with my supervisor, any ethical issues arising from this.

Where will the data be stored?

Yes: YesNo:

In my personal laptop.

I confirm that to the best of my knowledge:

How long will the data and records be kept for and in what format?

Anuruddha Perera Computing Research Project Assignment

The above is an accurate description of the study. Consent from participants will be obtained. Students involved in my study will be informed and their privacy will be observed. The consent form will be kept for the research.

Till the research is been done the records will be kept and it will be in pdf formats.

Will data be kept for use by other researchers?

Yes: No: No

Name: Anuruddha Perera

7

Date: 11.09.2020

Will you debrief participants at the end of their participation (i.e. give them a brief explanation of the study)?

If yes, please provide further details:

Please submit your completed form to: Ahamed Mubarak

Higher Nationals

Internal verification of assessment decisions – BTEC (RQF)

INTERNAL VERIFICATION – ASSESSMENT DECISIONS			
Programme title	HND IN COMPUTING AND SYSTEMS DEVELOPMENT		
Assessor		**Internal Verifier**	
Unit(s)	Unit 13: Computing Research Project		
Assignment title	Final Research		

Student's name	Anuruddha Perera		
List which assessment criteria the Assessor has awarded.	**Pass**	**Merit**	**Distinction**
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• Agreeing actions?	N			
Does the assessment decision need amending?	Y/N			
Assessor signature			**Date**	
Internal Verifier signature			**Date**	
Programme Leader Signature(if required)			**Date**	

Confirm actioncompleted			
Remedial action taken			
Internal Verifier signature		**Date**	
Programme Leader signature (if required)		**Date**	

Higher Nationals - Summative Assignment Feedback Form

Student Name/ID	Anuruddha Perera		
Unit Title	Unit 13 CRP		
Assignment Number	1	**Assessor**	
Submission Date	17.08.2020	**Date Received 1st submission**	
Re-submission Date		**Date Received 2nd submission**	

Assessor Feedback:

LO2 Conduct and analyze research relevant to a chosen computing research project

Pass, Merit & Distinction Descripts	**P3** ☐	**P4** ☐	**M2** ☐	**D1** ☐

LO3 Communicate the outcomes of a research project to identified stakeholders

Pass, Merit & Distinction Descripts	**P5** ☐	**M3** ☐	**D2** ☐

LO4 Reflect on the application of research methodologies and concepts

Grade:	**Assessor Signature:**	**Date:**
Resubmission Feedback:		
Grade:	**Assessor Signature:**	**Date:**
Internal Verifier's Comments:		
Signature & Date:		

* Please note that grade decisions are provisional. They are only confirmed once internal and external moderation has taken place and grades decisions have been agreed at the assessment board.

Assignment Feedback

Formative Feedback: Assessor to Student
Action Plan

Summative feedback

Feedback: Student to Assessor

Assessor signature		**Date**	
Student signature		**Date**	

Pearson

Higher Nationals in

Computing

Unit 13: Computing Research Project

Assignment 01

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11. I acknowledge that the attachment of this document signed or not, constitutes a binding agreement between myself and Edexcel UK.
12. I understand that my assignment will not be considered as submitted if this document is not attached to the attached.

anuruddhaperera.cs@gmail.com 30.08.2020

Student's Signature: **Date:**

(*Provide E-mail ID*) **(*Provide Submission Date*)**

Assignment Brief

Student Name /ID Number	Anuruddha Perera
Unit Number and Title	Unit 13 – Computing Research Project
Academic Year	2017/2018
Unit Tutor	
Assignment Title	**Final Research Project Proposal**
Issue Date	
Submission Date	17.08.2020
IV Name & Date	

Submission Format:

The submission is in the form of an individual written report. This should be written in a concise, formal business style using single spacing and font size 12. You are required to make use of headings, paragraphs and subsections as appropriate, and all work must be supported with research and referenced using the Harvard referencing system.

Report format- Please provide a referencing list using the Harvard referencing system. The recommended word limit is minimum 4,500 words

Unit Learning Outcomes:

LO2. Conduct and analyses research relevant to a chosen computing research project

LO3. Communicate the outcomes of a research project to identified stakeholders **LO4.**

Reflect on the application of research methodologies and concepts

Assignment Brief and Guidance:

Learner is now required to provide a comprehensive research project report based on the findings of secondary and primary researches carried out on the project proposal submitted in the previous section.

The Learner requires to produce a detailed research project report covering following areas

- Conduct primary and secondary research using appropriate methods for a computing

research project that consider costs, access and ethical issues.

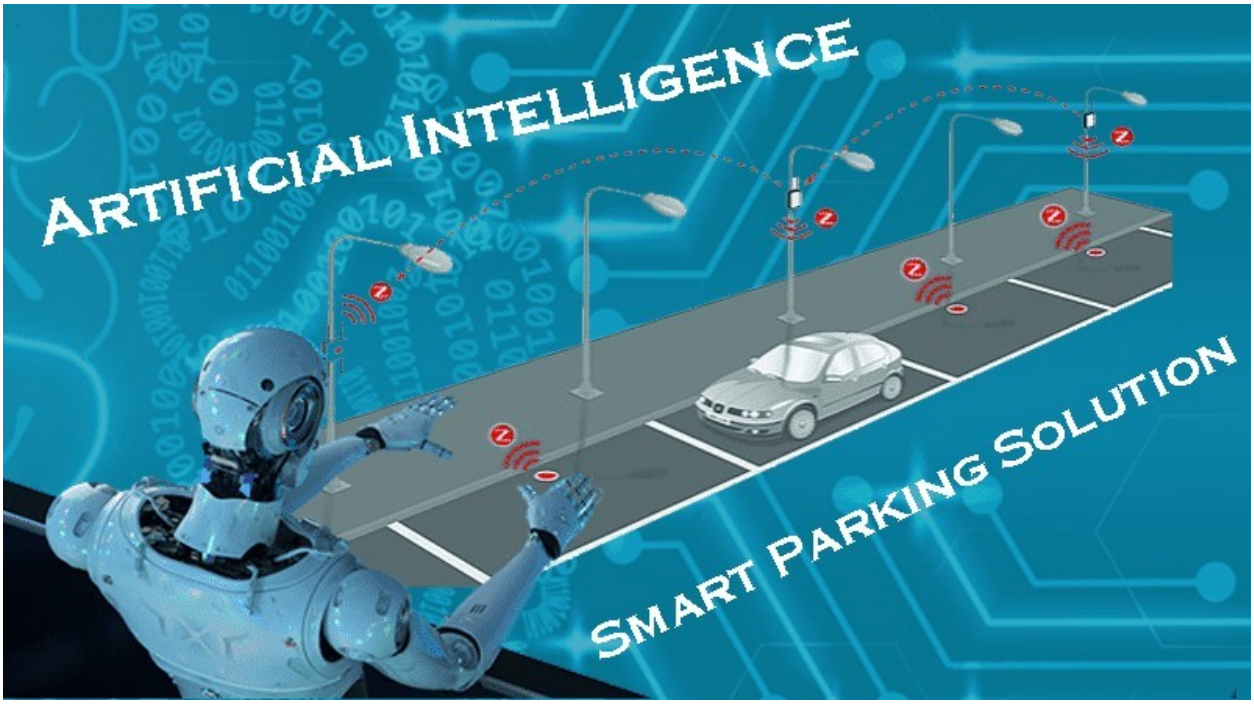
- Carry out your research and apply appropriate analytical tools to analyses research findings and data.
- Draw conclusion based on the research findings.
- Communicate the outcomes of your research project to the identified audience.
- Reflect on the success of your research project and your performance at the end of the project with the inclusion of a project evaluation and recommendations (Consider alternative research methodologies and lessons learnt in view of the outcomes)

Grading Rubric

ading Criteria	Achieved	Feedback
Produce a research proposal that clearly defines a research question or o thesis, supported by a literature review	CRP Proposal	
Examine appropriate research methods and conduct primary and ondary research.	CRP Proposal	
Conduct primary and secondary research using appropriate methods for omputing research project that consider costs, access and ethical issues	45-50	
Apply appropriate analytical tools to analyze research findings and data.	49-55	
1 Evaluate different research approaches and methodology, and make tifications for the choice of methods selected based on philosophical/ oretical frameworks.		
2 Discuss merits, limitations and pitfalls of approaches to data collection d analysis.		

Communicate research outcomes in an appropriate manner for the ended audience.	41-47	
3 Coherently and logically communicate outcomes to the intended dience, demonstrating how outcomes meet set research objectives.		
Critically evaluate research methodologies and processes in application a computing research project to justify chosen research methods and alysis.		
Communicate critical analysis of the outcomes and make valid, justified ommendations.		
Reflect on the effectiveness of research methods applied for meeting ectives of the computing research project.	28-33	
Consider alternative research methodologies and lessons learnt in view	58-59	

the outcomes.		
4 Provide critical reflection and insight that results in recommended ons for improvements and future research considerations.		
Demonstrate reflection and engagement in the resource process leading recommended actions for future improvement.		



Final Research by: Anuruddha Perera

Abstract

Nowadays due to the improvement of information technologies for smart parking systems, it remains a good option to manage the limited parking resources in busy urban areas, in this paper dynamic parking management system is use with parking meter machine, parking sensors, parking reservation to develop system with wide high-quality performance or a smart parking system.

Artificial intelligence is changing the transport sector. From helping cars, trains, ships and aero planes to function autonomously, to making traffic flows smoother, it is already applied in numerous transport fields. Beyond making our lives easier, it can help to make all transport modes safer, cleaner, smarter and more efficient. Artificial intelligence-led autonomous transport could for instance help to reduce the human errors that are involved in many traffic accidents. However, with these opportunities come real challenges, including unintended consequences and misuse such as cyber-attacks and biased decisions about transport. There are also ramifications for employment, and ethical questions regarding liability for the decisions taken by artificial intelligence in the place of humans.

Wireless sensor networks (WSNs) have pulled in expanding considerations from both academic and industrial networks. It tends to be conveyed in different sorts of situations to monitor and collect information. Wireless sensors are embedded in the ground, under the pavements where they will not interfere with line of sight and will not influenced by climate changes. They work by utilizing vehicle metal spotting in parking spaces using magnetometers, but more precise sensors that use radar spotting are also currently available. The parking procedure would then be able to be a straight forward and constant procedure. More importantly, smart parking is a secure and security mindful parking system. I have proposed a proper system to prevent privacy attacks. I have exhibited the architecture and implementations of the system.

Acknowledgment

The following research was completed with the help of many people known as well as unknown to me. I extend my heart-felt gratitude to each and every one of them. Most importantly, I would like to express a special appreciation to the following individuals.

Specially I would like to thank my parents and my friends for heartening and supported me to do this Research.

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Introduction Research background

This section examines on the introduction of study. It speaks the outline of the study and briefly clarifies the background, the problem statement, aim, and research objectives, and research questions, scope of limitations significant of study and outcomes of this research.

Fundamentally any structure or building in urban area must think about space for parking area, people need an appropriate vehicle parks to be given to them inside or outside. However, if they give only a parking area for people it would be not enough without a proper parking system people would park their vehicles in a disorder manner. Also, on-street parking in urban areas in Sri Lanka faces the same problem without having a proper parking system. Without having a proper parking system lot of problems arise, vehicles overcrowding caused the traffic is worrying problem in global scale and this problem is growing very rapidly. In urban areas in Sri Lanka traffic is a huge problem due to increasing number of vehicles. When people gather to urban areas to do their commercial activities without having proper parking system pollution, traffic and the security of vehicles under threat.

To minimize those problems, I have proposed a smart parking system for urban areas in Sri Lanka. The study of parking system targets to develop the parking services with the limited available resources. The searching of a parking space in a parking lot in urban areas is a so much frustrating for many people. More obstacles increase with the high growth rate in the registration of new automobiles urban areas. There are many parking places existing but many drivers don’t know about the parking blocks or about the system. To overcome these problems of gridlocking of traffic and to save fuel from it, the solution should be smart parking. By this smart parking system time, preferences and energy consumptions holds key note. When deciding an efficient smart parking system mobile app is a good component. The intelligent or smart parking system must be proposed for searching the free or about to vacant parking space. The above said system

based on image processing technique which captures and processes the rounded image drawn at parking lot produces the information of the empty car parking spaces, with the help of the Android App, App on the mobile phones by the existing data records or by searching the vacant spots through the App. In smart parking system, users can access data to determine the availability of spots for parking and then pay for them online. Also, the App provides all possible short routes for the parking from any area of the city. Thus, smart parking improves the utilization of existing parking, leading to greater revenue for parking owners. It also benefits for the environment and plays a major role in creating eco-friendly environment.

Scope and limitations of study

The scope of this research study is to arrange a proper smart parking system for that these components must include, Parking Assistance System include three information management module, Control module and a displaying unit. Along with above three modules it will also have information management system to maintain a data base of parking space and will have a SMS gateway. The monitoring module includes ultrasonic sensors/ ambient light sensor which identifies the free parking spaces and transmits the information to control unit via protocol technology. Apart from detecting the car the sensor also provides additional information like the stretch of time the car has been parked and also its security status. The control units process the information and sends the information to information management system. Information management system receives information of parking space from the display through system. Users also can get the information such as slot allotted, time parked, parking payment information and directional details by the user’s mobile phone too. Fixed cameras have the advantage of monitoring several parking spots at once, usually a street lane or a significant area of a parking structure. They are also instrumental in enforcement of parking rules and policies through the cameras and capture violations. The most significant advantage of cameras is that they can be used in management of traffic as well as surveillance.

Below are some key points have been spotlighted during my research scope

Protect vehicles using CCTV cameras while parking.

Fixing auto pay machines in correct potions.

Provide sensors to track vacant parking areas with the of drivers app.

To recognize the key component of the smart parking system.

Limitations

Limitations about this research project is carried out in Sri Lanka and this project is not carried outside or Sri Lanka, because Sri Lanka is a developing country and smart parking system is matched than fully automated parking system and also budget of this research is limited with the time to complete this research, so these are some of the key limitation points,

Time limitation of the research.

This investigate was fundamental coordinated on the assembled information from different data tests.

Limiting some features like smart lock, wheel clamp and parking lock.

Planting trees around parking areas limiting because of the extra cost and less time to execute the idea.

Research problem

After a random questioner from different people from urban areas. I have found the problem statement,

The existing car parking system is outdated. The increasing number of vehicles due to the rapid growth of population leads to the traffic congestion. This is the reason behind the unmanageable parking in urban areas in Sri Lanka.
In this industrialized society, there is huge increasing number of vehicles. This problem is leading to the growth of the urban areas in Sri Lanka. When noticing about issues, for example, people always come to do their commercial activities to urban areas then parking vehicles is difficult due to the busy parking lots. So, government in Sri Lanka will have to find large land areas for more parking spaces.

Current parking system in Sri Lanka is done with a manual system, human labor is use to collect the parking payments, sometimes users are going without paying the parking payments and also in the manual system in Sri Lanka there are no CCTV cameras are used, because of that safety of the park vehicles also under a threat. In urban areas sometimes users park their vehicles in wrong places, due to that accidents also can occur.
The main issues that the increasing number of vehicles and the reducing productivity of modern busy parking spaces in Sri Lanka are:

- Valuable time wasted to find a parking spot by this traffic will increase, because cars Required to drive around. Within average around, 4.5-12 minutes spent looking for a spot in urban area parking lots.
- More wastage of energy occurs while users driving around parking lots, this problem will lead to the pollution of Environment due to the emissions of vehicle smoke being produced.
- Another main problem is the disordered of parking lots. When considering to Sri Lanka it’s around 250 accidents occurred due to vehicles in disorganized parking lots.

Further there are some common reasons behind the parking issues in Sri Lanka. As Sri Lanka have absolute number of 6.6 million vehicles. Yet with regards to parking vehicles vacant spaces

has to be the minority of urban cities .current circumstances in urban territories is to such an extent that interest for parking lots is double the supply ,very cheap parking prices ,no appropriate footpaths tracks are developed because of that working places are not comfortable with lack of disorder vehicles are park by the drivers , normally the correct ways is driver should park their vehicles three or four meters away from foot paths .In this way to keep away from these sort of problems technologies must be applied to parking system.

Research question

Questioners are taken from people randomly to get a proper idea from people what they required more.

Research question

What is the effectiveness of introducing a smart parking system?

Research objectives

When analyzing the research many problems were found and how this problem increases. Main objective and aim were developed and also shown below as primary objective.

Primary objective

To determine the effectiveness introducing solution of smart parking system.

Further clarification

Analyzing the security of vehicles after parking, multiple options of payment for parking services. Identification of free parking spots and providing that information to users on the road This a primary objective must be cleared. Since traditional parking systems doesn't have CCTV cameras vehicles security under a treat. Vehicles can be damage and parts also can be stolen. Less security of vehicle is a major issue. Suggestion of auto pay machine for uses which can handle bank notes and card payments too. By this system human labor will reduce. Including a tracking vacant space for parking with the use of mobile app. By this app driver can easily find proper parking and safety parking place. Improved enforcement methods to ensure there are no significantly overstaying vehicles. Giving notification to users about time period of their vehicle parking. Relay data to the transport authority of the city to be used for policy making. Regulation and proper policy making must introduce to users.

Research significance

Gainful vehicle halting – Users locate the best spot accessible, sparing time, assets and exertion. The halting district completes off beneficially and space can be used really by business and corporate segments.

Less traffic–Traffic stream increases as less vehicles are required to drive around scanning for an open parking spot.

Decreased air contamination – Searching for stopping eats up around one million barrels of oil multi day. An ideal ending blueprint will essentially diminish driving time, in this way chopping down the extent of well-ordered vehicle discharges and over the long haul reducing the worldwide natural impression.

Redesigned client experience – An amazing ending blueprint will organize the whole client experience into a bound together activity. Driver's part, spot ID, region pursue and time cautions all dependably wind up being a touch of the target area process.

Income streams – Many new compensation streams are conceivable with marvelous ceasing progression. For instance, part proprietors can draw in layered bit choices subject to parking spot district. Besides, reimburse undertakings can be encouraged into existing models to help go over clients.

Made Payments and POS – Returning clients can supplant every day, manual money parcels with record invoicing and application divides from their telephone. This could in like way empower client dedication adventures and critical client input.

Broadened wellbeing – Parking part delegates and security screens contain constant bundle information that can help check stopping infringement and suspicious improvement. Mark assertion cameras can store up relevant film. Additionally, decreased spot-looking improvement in the city can reduce misfortunes achieved by the distraction of inspecting for ending.

Steady information and pattern understanding – Over time, an insightful stopping strategy can pass on information that reveals affiliations and instances of clients and groups. These models can wrap up being basic to part proprietors concerning how to make switches and climbs to drivers.

Diminished Management Costs – More computerization and less manual advancement gets a decent arrangement on work cost and asset weariness.

Expanded Service and Brand Image – An anticipated encounter can truly remove a corporate or business substances imprint picture to the client. Regardless of whether the goal is a retail location, a plane terminal or a corporate business office, guests will no ifs, ands or buts be awed with the bleeding edge improvement and comfort factors.[CITATION pla16 \l 1033]

Chapter Two

Literature review

Car parking system is a system that helps to manage vehicles in other parking areas to prevent congestion and to arrange vehicles in an assigned place. The scheme also enables monitor how many vehicles pass through the door and how long each vehicle will take, and then calculate how much cash a vehicle should pay when exiting. Car parking system is used in many congested areas or locations where many individuals meet, such as where there are more than one shopping complex close each other or where there are megamalls or stadiums. For instance, like Sunway, Timesqure, and Lowyat, all of them in Malaysia. Fundamental part of this research is the literature review and I have completed a research by Experiencing web, articles, books and journals. Above sources helped me to find some new technologies which were implemented by other countries and which has not implemented in Sri Lanka.

Types of parking system used in around the world

Wired sensor-based system uses sensors such as ultrasonic sensors installed at each car park. These sensors are connected to a central control unit that stores and manages data about parking occupancy. This data is then forwarded to display panels in the car park at deliberate places. The display boards provide drivers with data, guidance and guidance on vacant parking lots. [CITATION UKE19 \l 1033]

Intelligent Parking Management System Based on Image Processing

The system captures and processes the rounded picture taken at the parking lot and generates data on vacant parking spaces. A camera is used as a sensor to take pictures to demonstrate car park occupancy. A single camera can detect the presence of many vehicles at once. Disadvantages the weather conditions influence the system, i.e. the visibility of the system. The camera should be in a place where all the vehicle parks can be seen and no objects can be obstructed. No guidance is given to the parking lot. Author **(**Hilal Al-Kharusi).

Importance of smart car parking

The smart parking system improves the number of vehicles in a garage that can be parked. It offers more parking spaces as the cars are parked well organized. If you use an automated parking system, the construction of a garage will require only a smaller area of property. Compared to ramp-style parking facilities, this system allows safe parking of cars. This parking method is so convenient for drivers and in search of parking spaces they don't need to walk. This scheme decreases garage maintenance costs as it considerably decreases ventilation and lighting demands and also does not require expensive deck repairs. As mentioned previously, in the smart car parking system, the chances of vehicles getting damaged owing to incorrect parking are significantly decreased. There are no or very minimal chances that the vehicle will get lost with smart car parking system. But in the traditional parking technique, this is not the case. Lot of problems like traffic in urban areas, pollution and threats happen without having a proper parking system, these problems will minimize with a smart car parking system.

Introduction

Data and methods used

After the literature review, it has come to start contemplating the research arrangement to answer the variables identified with the collected information through literature review. And also, I must identify which procedure use to aggregate the data for the research. Then I need to find research strategy to collect data and line up best information by interview from different drivers on street and garage parking areas.

Discovering the research plan technique is like assessment method in common. First, I need to discover general information on ask about diagram and procedures by then increase establishment data on the methodology of data need to accumulate in conclusion, pick a system and test estimation to use in the assessment. The conduct strategies design how to discover information about research reasoning from reference books articles and propositions.

I have shown in the research questioner section build up questions to different drivers, hypothetical structure alongside variables first, after distinguish the plan and data should be gathered in an alternate source, for example, web articles, books, digital books. The depended and independent variables will be recognized and clarify model of this research was successes, and also depended and independent variables were recognized the hypothesis it would have helped me to demonstrating the null hypothesis or various hypothesis attach with negative or positive will be recognized. Be that as it may to check every one of this information was gathered to structured and results were taken as graphical outlines and all of these were clearly clarified in my research as pursues.

Data gathering(Primary Method)

Poll or questionnaires were made to store up information from the drivers at various sorts of vehicle parking areas, for find issues or opening. I expect to collect information level of partners and sources. As such assemble the data for this assessment, I applied questionnaire, survey, pilot outline. Data dismembering is a methodology of the assessment, examining, planning and showing up with the goal of discovering, satisfying information, underwriting terminations and supporting real research. Data will be amassed as fundamental data gathering and discretionary data gathering systems.

Basic Data collection procedures that I used to gather information

Data accumulation techniques field survey. A field survey comprises in going (in the picked division) to direct a complete study of information identified with the estimation of parking limit. Information gathering by field study is made for two sorts of parking, for on street parking and outside parking.

On street parking information accumulation; all data identified with parking are noted, among others the lengths of road areas, the quantity of perpetual hardware (Transport stops, car spots, five hydrants, etc.…) The data given by administrative signs (containing the severe restrictions of parking at any time) and parking accessibility by sort (private, paid, free, subsidized and public)

Outdoor parking information accumulation; data is gathered about the zones of parking sports, the kind of stopping accessible and the data given by guideline overseeing the parking (which has less variety than for on street parking) The upside of this strategy is

that it is extremely exact and gives definite data. Be that as it may, inclusion to start costly and subject to climate limitations, this technique has numerous strategic requirements.

Research methodology

Research methodology would contain considering of this research technique that would be use some bit of my endearer research to perceive to discover the effect of the keen smart parking system for parking areas to drivers to secure the vehicles and this would reduce traffic, environment pollution in urban areas of Sri Lanka. This research is connected to finding various method for using smart parking in daily usage. Thus, this research was embraced by me to financing all various method technologies the research method is separated as primary research, it comprises of obtained questionnaires, interview from various peoples, direct interview for example, face to face interview would be completed in primary research these questions are incorporated.

Data sample method

Sampling methods can be divided into two different ways stratified sampling method and convenience sampling.

Out of previously mentioned strategies I have utilized stratified sampling method and underneath I will be referencing way I have utilized and what this technique really does.

Sample

I had the ability to accumulate data just from 62 of populace from different sorts of drivers who use various kind of parking spaces to park their vehicle. Data was accumulated by the pack testing procedure. The testing was divided into segregate fragments and balanced in shape of arrangement, example where drivers were chosen from the objective populace. I will be categorizing users AGE vise GENDER vise and there using VEHICLE TYPE. After that the data researching for the investigation was immediate to assessment the data from the model gatherings.

Clusters	Responds
Shopping center parking places	15
Office premises parking places	16
On-street parking places	16
Private parking garages	15

Table 1data clusters

As a survey this will be done and every one of these questioners will be priories in mix of my dependent and independent variable and these study questioners will be shown below in my research too for further understanding.

Stratified Sampling Method

Stratified Sampling is alike hood researcher separate the whole populace into various subgroups, at that point randomly chooses the last subjects relatively from the various groups.

With this method, I have a higher statistical accuracy contrasted with basic random sampling, because variability within the subgroups is lower contrasted with the varieties when managing the whole populace.

Since this method has high statistical precision. It likewise implies that it requires a little sample size which can save a lot of time, cash and exertion of the researchers.

As indicated by stratified sampling technique in my examination have arranged questioners also which is independently made to drivers where I have chosen random parking areas in Sri Lanka and as indicated by stratified, I have separated into subgroups as appeared in **table 02**.

And also, the questioners are separated into gatherings and convey to them to get their assessment since parking system is going to change since as a researcher. I need to build some questioners and give them among these graphs.

Conceptual framework

Below is a preview how the smart parking system works and smart parking working process also shown by this diagram.

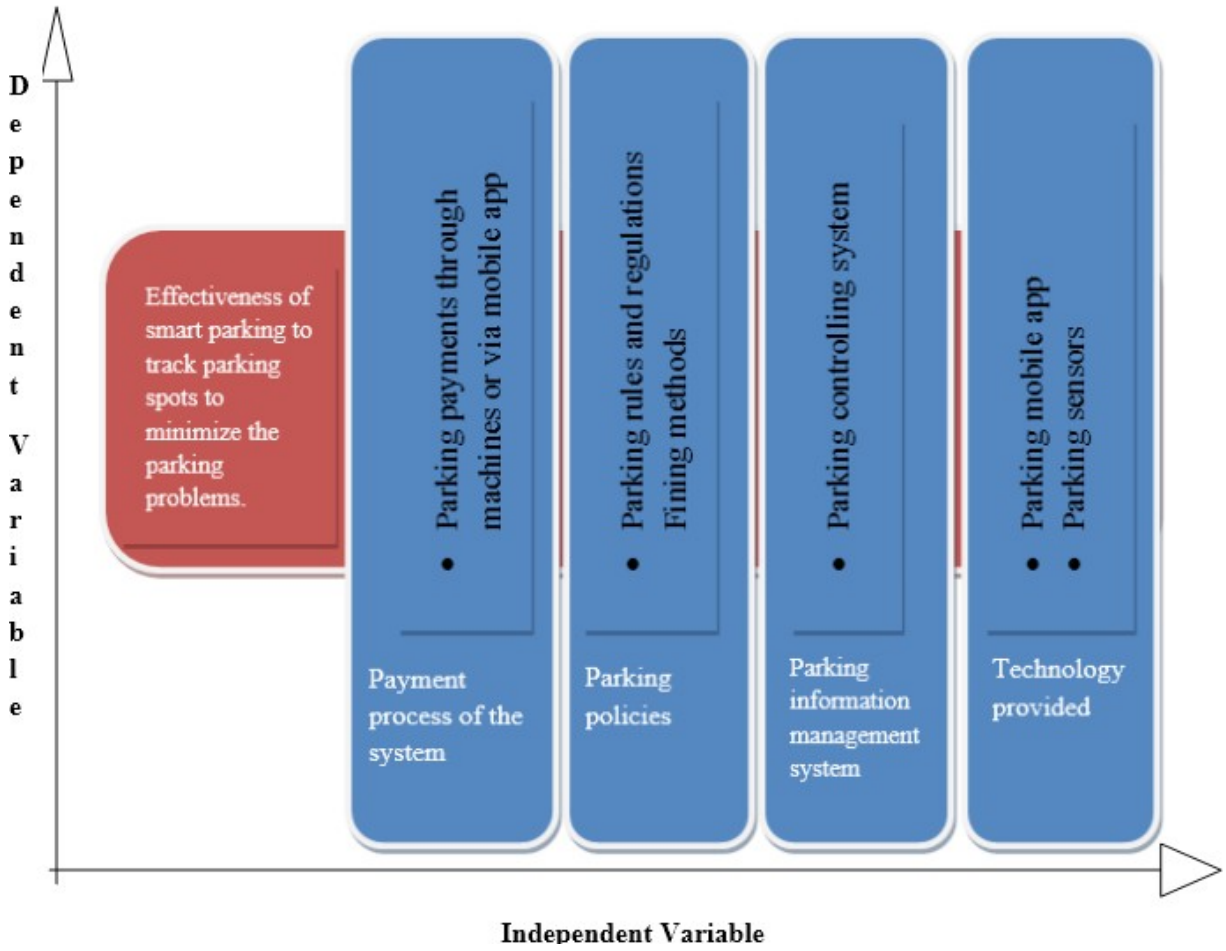


Figure 1 Conceptual framework

Research identified variables

Independent	Dependent
Payment procedure	
Parking policies	Effectiveness of smart parking to track parking spots to minimize the parking problems.
Information management parking system	
Technology provided	

The reason why I have identified these elements that I am going to use in the research.

Variables help to make vital questions for the assessment.

To make persuading hypothesis. The assessment will be attempted by the hypothesis.

To test the recognized survey, need to find variables.

Significant variables are making the right questionnaire.

What is hypothesis?

In a scientific context, hypothesis is a statement that can test the relationship between two or more variables, or a proposed explanation for some observed phenomenon. In a scientific experiment or study, the hypothesis is a brief summary of the predictions of the findings of the study by the researcher, which may help to revisit it. Hypothesis testing is at the core of the scientific method. The specialist's expectation is normally alluded to as the elective theory, and some other result as the invalid speculation - fundamentally, the contrary result to what is unsure (However, the terms are switched if the analysts are anticipating no distinction or change, theorizing, for instance, that the frequency of one variable won't increment or decline pair with the other.) The invalid speculation fulfils the prerequisite for articulation. the limit with regards to a suggestion to be refuted, which a few ways of thinking think about basic to the logical technique. As per others, in any case, testability is adequate in light of the fact that if there is adequate help for a theory it isn't important to have the option to consider a contrary result.

Hypothesis testing of parking system for operating vehicle

In a creative and proactive way to deal with decide the reasons for the parking garage accessibility issues in research Vellore, we present a factual proof which is reliable with our hypothetical discoveries, as got from the review. Testing of speculation assumes a significant job in explanatory investigations for a given issue. While utilizing factual induction tests, analysts like to close outcomes based on the information got from populace. Here, it must be noticed that the whole populace can't be tried exclusively. This can be because of the enormous volume of information present or the time required to dissect every datum independently. In this way, we have to remove a subset of the populace to make our examination simple. This carries us to examining of our information

We led a study to draw out the causes and arrangements of the parking area accessibility issues in research. Through the overview, we decided the reasons for the parking garage accessibility issues which are expanding number of vehicles, absence of guidelines in leaving vehicles, use of parking areas for business exercises and vehicles not left in a legitimate manner. Presently, utilizing speculation testing we will check the foundations for the parking area issues.

Joining Artificial Intelligence with existing vehicle leaving frameworks is relied upon to improve the progression of traffic together with sparing time of drivers while leaving their autos. This procedure will be utilized in this task since I have individual enthusiasm for the utilization of Artificial Intelligent in different applications. Other than having interest, it is imperative to encounter some smart segment inside the continuous frameworks. From the diverse stopping frameworks referenced before, it is fascinating to have a stopping framework that has advancements which plays out some human assignments. More support for such intrigue is to help stopping clients to improve their time the executives.

Hypothesis

H1 payment process

H 1: Because of the Smart parking system, the payment procedure will not affect driver's fulfilment. NULL (Which has no effect on the dependent and independent variables)

H 1.2: Because of the Smart parking framework, the payment procedure positively affects driver's fulfilment.

H 1.3: Because of the Smart parking system, the payment procedure doesn't positively affect driver's fulfilment.

This scenario include how users will react the payment procedure and if the payment procedure approach defend how will affected by positively, negatively or not affected.

H2 parking polices

H 1: Smart vehicle parking system provided policies has No relationship between user's satisfaction NULL (Which has no effect on the dependent and independent variables)

H 1.2: Smart vehicle parking system provided policies has positive relationship between user's satisfaction

H 1.3: Smart vehicle parking system provided policies isn't a negatively relationship between user's satisfaction

This scenario include how Smart vehicle parking system provided policies and If the users satisfaction procedure approach define how will relationship positively, negatively or No relationship between user's satisfaction.

H3 parking information management system

H 1: Smart vehicle parking system smart device using information management process will not affected by user's satisfaction

H 1.2: Smart vehicle parking system smart device using information management process will positive Affected by user's satisfaction

H 1.3: Smart vehicle parking system smart device using information management process doesn’t have a positive Affected by user’s satisfaction

This scenario include how users will react the information management process and if the user’s satisfaction procedure approach define how will affected by positively, negatively or not affected.

H4 technology

H 1: NULL (Which has no effect on the dependent and independent variables)

H 1.2: If smart parking users are able to use or adopt new technology, then the smart parking will have a positive impact while attracting users as well as implementing new technology.

H 1.3: If smart parking could not afford to use the technology then there will be a comparison measured in between users related to parking and negative impact on customer satisfaction.

This scenario include how Smart vehicle parking system provided technology and if the technology how will be affected positively, negatively or No affected by user’s satisfaction.

H5 effectiveness

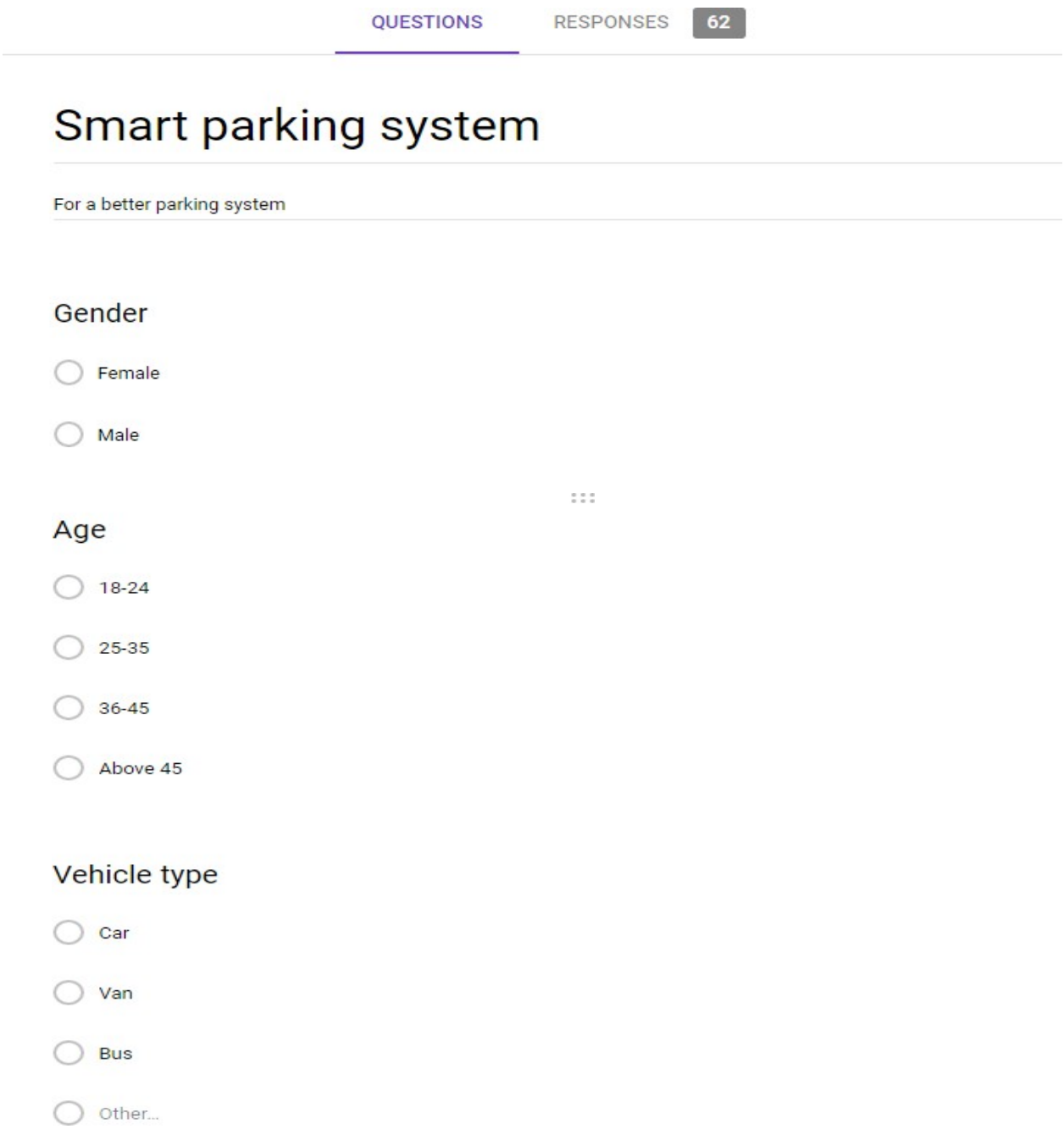
H 1: Because of the Smart parking framework, the effectiveness procedure will not affect driver's fulfilment. NULL (Which has no effect on the dependent and independent variables)

H 1.2: Because of the Smart parking framework, the effectiveness procedure positively affects driver's fulfilment.

H 1.3: Because of the Smart parking framework, the effectiveness procedure doesn't positively affect driver's fulfilment.

This scenario include how Smart parking framework provided effectiveness procedure how will affected positively, negatively or No affected by user’s satisfaction.

Questionnaires that distributed



Travelling frequency in urban areas?(as an estimation) *

Short answer text

Main purpose of travelling in your own vehicle in urban areas?

- Office work
- Commercial activities
- Personal
- Leisure activities
- Other...

Do you prefer paid parking with benefit or free parking?

- Paid parking with benefits
- Free parking

Are you satisfied with the traditional parking system?

- Yes
- No

What are the difficulties you face by the traditional parking system? *

Long answer text

Would you prefer mobile app for parking management system?

- Yes
- No
- Maybe

Are you satisfied the amount of time period that you use to find free parking spot?

- Yes
- No

Any recommendation for a proper parking system?

Long answer text

Do you prefer parking information management system? *

- Yes
- No

Are you satisfied if parking rules and regulation introduce?

- no
- yes

Data Analysis

Introduction

Data Analysis is a process of testing, cleaning, transforming and modelling data with the objective of finding useful information, informing conclusions and assisting in decision making. There are many dimensions and approaches to data analysis, different techniques under different names, and different business, science and social science domains. In today's business world, data analysis helps make critical scientific decisions and helps businesses run more efficiently

Data analysis is part of a larger process of deriving business intelligence. The process involves one or more of the following steps:

Defining Objectives: Any study should start with a set of clearly defined business objectives.

Posing Questions: Attempts to ask a question in the problem domain.

Data Collection: Relevant data should be obtained from appropriate sources.

Data Wrangling: Raw data can be collected in several different formats.

Data Analysis: This is the step of importing cleaned and collected data into analytics tools.

Drawing Conclusions and Making Predictions: After adequate analysis, conclusions can be drawn from the data, which is an appropriate predictive measure.

Data coding of the research

This is a method for dealing with transport support data coding designed for research and values are speared with multiple choices and as below I have mentioned few samples. The highest number is given in strict agreement. Those who strongly disagree are given the lowest value.

Rank	5	4	3	2	1
Parameter	Strongly agree	Agree	Neutral	Disagree	Strongly disagree

Table 2 data coding

This is the information coding used to evaluate the research-based Likert questionnaires. For the highly agreed ad highest number value provided to the highly disagreement, the highest number value is provided.

Questionnaires results and discussions

Data visualization

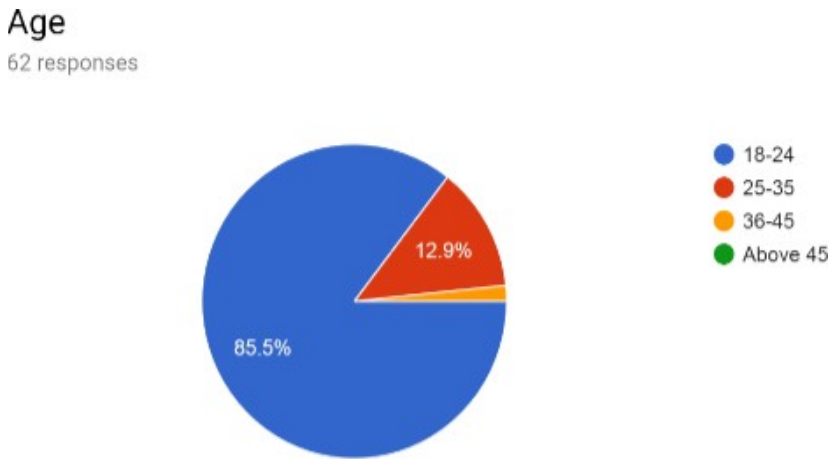


Figure 2 age visualization

Time Slot	18-24	25-35	36-45	Above
9:30 AM – 11:00 AM	2	10	0	0
11:00 AM – 12:30 PM	3	15	1	0
2:00 PM – 3:30 PM	1	10	0	0
3:00 PM – 4:30 PM	1	22	0	0

4:00 PM – 5:30 PM	1	6	0	0

Table 3 age stats

This scenario will be tested different age groups how will affect Dependently in the Smart parking system So we can say that most of the drivers involved in the exploration are young or old.

According to the outline above the 18-24 age group had the greatest number of members of the chart it's an 85.5% of total. There were above members to explore after that age. So, I can say that most of the drivers involved in the exploration are young.

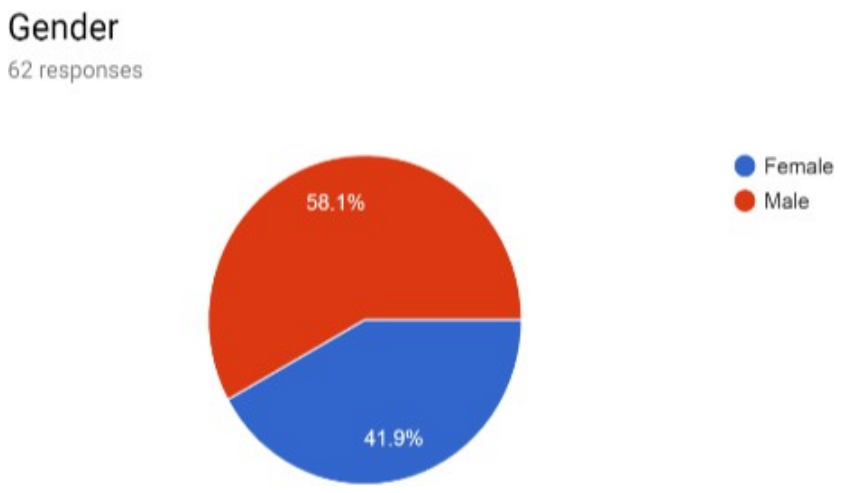


Figure 3 gender visualization

Time Slot	Male	Female
9:30 AM – 11:00 AM	5	6
11:00 AM – 12:30 PM	7	8
2:00 PM – 3:30 PM	10	3
3:00 PM – 4:30 PM	6	4
4:00 PM – 5:30 PM	8	5

Table 4 gender stats

This scenario will be tested different Gender groups how will affect Dependently in the research So we can say that most of the drivers involved in the exploration are Male or Female.

According to the outline above the Male group had the greatest number of members of the chart it's a 58.1% of total.

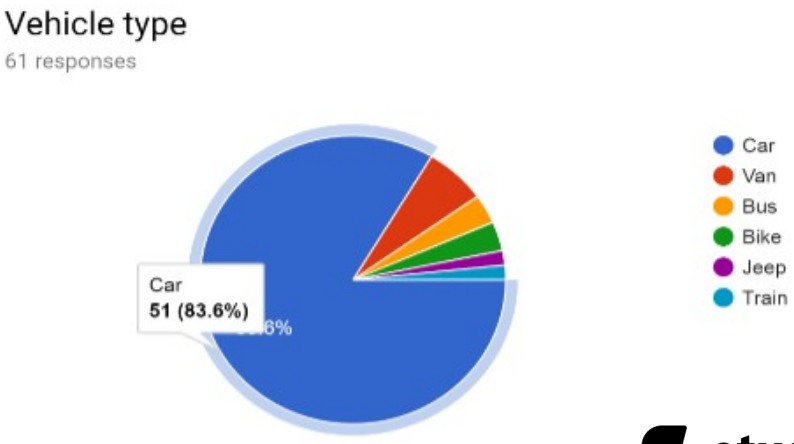


Figure 4 vehicle visualization

Time Slot	Car	van	Bus	Bike	Jeep	Train
9:30 AM – 11:00 AM	13	1	0	1	0	0
11:00 AM – 12:30 PM	22	0	1	0	1	0
2:00 PM – 3:30 PM	11	1	1	0	0	1
3:00 PM – 4:30 PM	4	1	0	1	0	0
4:00 PM – 5:30 PM	1	1	1	0	0	0

Table 5 vehicle stats

This scenario will be tested different Vehicle type groups how will affected dependently in the research, so that most of the drivers involved in the exploration are different type Vehicles. According to the outline above the Car Users are the greatest number of members, they are 83.6% other 16.4 %. The smallest part is a Train.

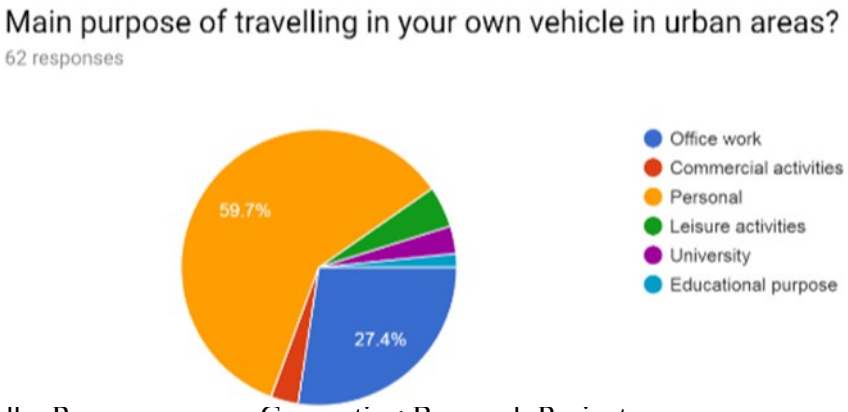


Figure 5 Travel purpose

Time Slot	office	commercial	personal	Luster	university	education
9:30 AM – 11:00 AM	7	4	1	0	1	0
11:00 AM – 12:30 PM	6	6	0	1	0	0
2:00 PM – 3:30 PM	4	4	0	0	0	0
3:00 PM – 4:30 PM	5	3	0	1	0	1
4:00 PM – 5:30 PM	8	2	1	1	0	0

Table 6 Travel purpose stats

This scenario will be tested different Travel purposes how will affected dependently in the research So we can say that most of the drivers involved in the explorations. According to the outline above the personal things number of members of the chart it’s a 59.7% of total. Other office work vehicle users are 27.4% of chart. So, I can say that most of the drivers involved in the exploration are personal things.

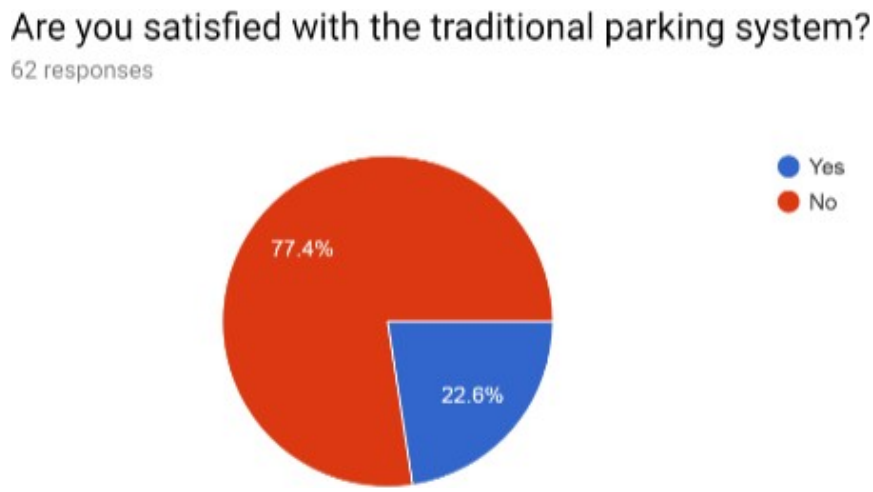


Figure 6 Satisfy of the traditional system

Time Slot	Yes	No
9:30 AM – 11:00 AM	8	4
11:00 AM – 12:30 PM	15	1
2:00 PM – 3:30 PM	9	5
3:00 PM – 4:30 PM	6	0
4:00 PM – 5:30 PM	10	3

Table 7 satisfaction

This scenario will be tested different parking system method how will affected dependently in the research so that most of the drivers involved in the exploration are traditional or new. According to the outline above the new system like group had the greatest number of members of the chart. It's a 77.4% of total. So, I can say that most of the drivers involved in new parking system and less are like to traditional system it's about 22.6%.

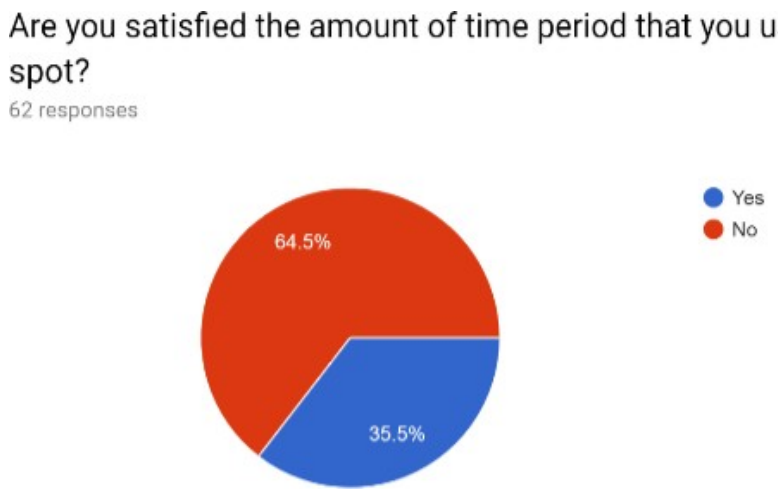


Figure 7 Time used to find a spot

Time Slot	Yes	No
9:30 AM – 11:00 AM	2	5
11:00 AM – 12:30 PM	5	1
2:00 PM – 3:30 PM	2	3
3:00 PM – 4:30 PM	0	1
4:00 PM – 5:30 PM	1	2

Table 8 Time used stats

This scenario will be tested different time period satisfaction groups how will affected dependently in the research so we can say that most of the drivers involved in the exploration are satisfaction or not satisfaction.

According to the outline above the not satisfaction group had the greatest number of members of the chart it's a 64.5% of total. Others are 35.5% are satisfaction of time period that free parking.

Hypothesis testing

In this section, the aim is to prove the hypothesis whether it is positive or negative, and this will be done through my research questions, and here all my variables are covered and highlighted, and as in my dependent variables and independent variables, the data collected from the questioners is shown here.

Variables Discussions

Here it will be discussed about the variables independent and dependent and according to that data collected and visualized pie charts will be shown with the satisfaction level of the drivers and how they feel about the systems if implemented to collect these requirements set of questionnaires were created and distributed out of the data collected below shown pie charts.

Payment process

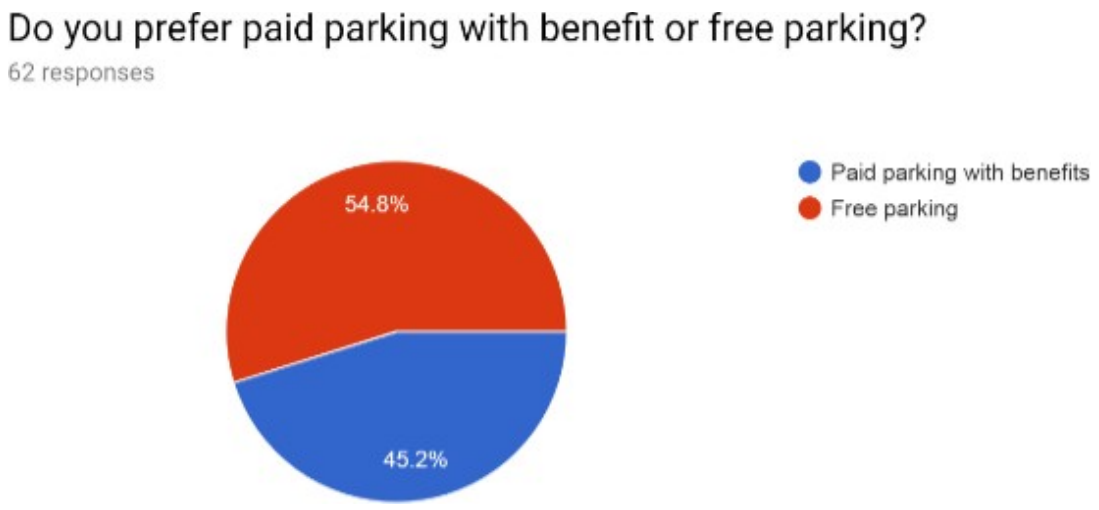


Figure 8 payment H1

Time Slot	Paid parking	Free parking
9:30 AM – 11:00 AM	6	7
11:00 AM – 12:30 PM	5	8
2:00 PM – 3:30 PM	6	6
3:00 PM – 4:30 PM	8	2
4:00 PM – 5:30 PM	3	5

Table 9 payment stats

This scenario will be tested different Payment groups how will affect Dependently in the research So we can say that most of the drivers involved in the exploration are Paid parking or Free parking. According to the outline above the Free parking group had the most amazing members of the chart it's a 54.8% of total. So, I can say that less of the drivers like to paid parking method.

Parking polices

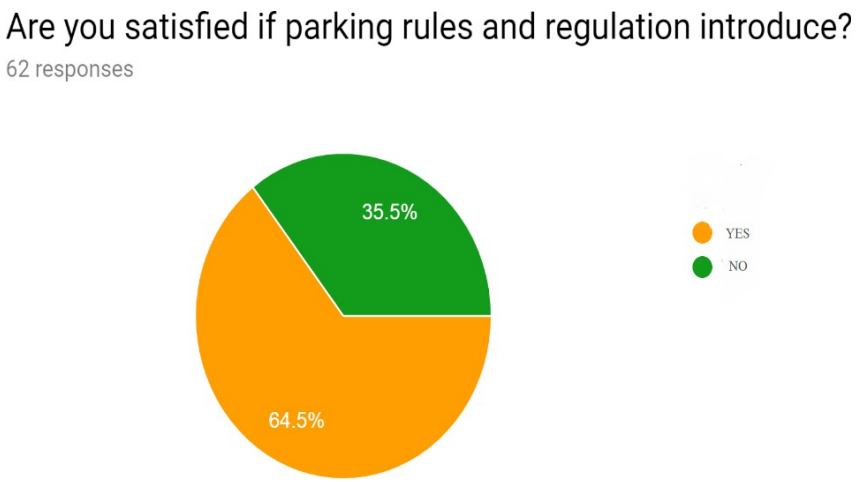


Figure 9 parking polices H2

Time Slot	Yes	No

9:30 AM – 11:00 AM	8	4
11:00 AM – 12:30 PM	15	1
2:00 PM – 3:30 PM	9	5
3:00 PM – 4:30 PM	6	0
4:00 PM – 5:30 PM	10	3

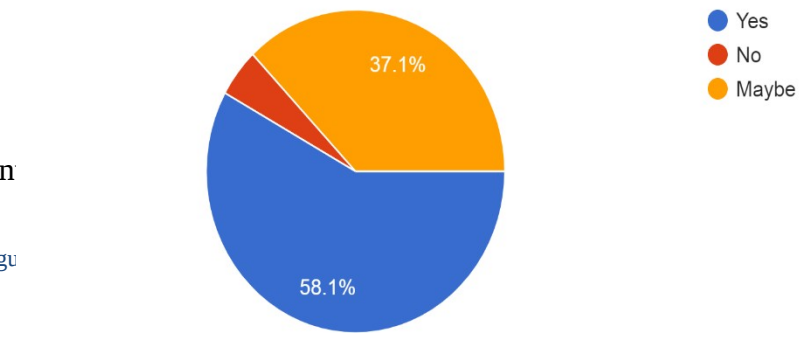
Table 10 Stats parking policies

This scenario will be tested different parking rules and regulations method how will affected dependently in the Smart parking system so we can say that most of the drivers involved in the exploration are traditional or new.

According to the outline above the new system like group had the greatest number of members of the chart. It’s a 64,5% of total. So, I can say that most of the drivers okay in new rules and regulations in the parking system and less are like to traditional system without rules and regulations it’s about 35.5%.

Parking information management system

An



Figu

Time Slot	Yes	No
9:30 AM – 11:00 AM	7	6
11:00 AM – 12:30 PM	8	6
2:00 PM – 3:30 PM	6	6
3:00 PM – 4:30 PM	8	2
4:00 PM – 5:30 PM	3	5

Table 11 Management stats

This scenario will be tested different parking system information management how will affected dependently in the Smart parking system so we can say that most of the drivers involved in the exploration are Information system satisfaction.

According to the outline above the new system like group had the greatest number of members of the chart. It's a 58.1% of total. So, I can say that most of the drivers involved in new information parking system and less are like to traditional system it's about less.

Technology requirement of the parking system

Figure 11 Mobile app technology H4

Time Slot	Yes	No	Maybe
9:30 AM – 11:00 AM	7	4	1
11:00 AM – 12:30 PM	6	6	0
2:00 PM – 3:30 PM	4	7	0
3:00 PM – 4:30 PM	5	4	2
4:00 PM – 5:30 PM	8	3	1

Table 12 Mobile app stats

Secondary Method

Online data Collection

Online records is facts that is gathered with the aid of the internet. In recent times, this method has end up popular due to the fact the internet offers a massive pool of each free and paid lookup sources that can be without difficulty accessed with the click of a button. While this approach simplifies the facts gathering process, the researcher should take care to rely solely on real sites when amassing information. In some way, the internet is a virtual aggregation for all different sources of secondary research data.

Data Gather from Libraries

Research substances can also be accessed through public and private libraries. Think of a library as an information storehouse that consists of an aggregation of essential data that can serve as legitimate statistics in distinctive lookup contexts. Typically, researchers donate countless copies of dissertations to public and personal libraries; especially in cases of academic research. Also, enterprise directories, newsletters, annual reviews and other similar archives that can serve as research data, are gathered and stored in libraries, in both gentle and difficult copies. I think that this method I can use for my research also.

Data gathering form institute of learning

Educational facilities like urban council, provincial council, and Municipal councils are additionally a wonderful supply of secondary data in this research. This is because a lot of lookup is carried out in educational institutions greater than in other sectors.

It is particularly less difficult to achieve lookup statistics from educational institutions due to the fact these institutions are dedicated to solving troubles and expanding the physique of

knowledge. You can effortlessly request lookup materials from academic facilities for the cause of a literature review.

Secondary research strategies can also be classified into qualitative and quantitative data series methods. Quantitative records gathering strategies include on-line questionnaires and surveys, reports about tendencies plus data about exclusive areas of a commercial enterprise or industry.

Qualitative research strategies consist of relying on preceding interviews and information gathered thru center of attention corporations which helps an organization to understand the wishes of its clients and layout to fulfill these needs. It additionally helps organizations to measure the stage of worker delight with organizational policies.

Summary of hypothesis testing

I explain why you should use statistical hypothesis testing and help navigate basic terminology. Hypothesis testing is a key procedure to draw conclusions about the population based on a random sample. These conclusions include estimation of population properties such as mean, differences between means, proportions and relationships between variables

As the shades for the first theory indicate, the diagram presented here speaks of the relationship between the procedure for installing the vehicle departure place and the satisfaction of the driver with them has a generally positive effect.

As indicated in the study of colors for the second theory, the graph presented by me talks about the relationship between data leaving the vehicle, management and performance of drivers about them, has a completely positive effect.

As indicated in the study of color theory for the third theory, the diagram that I presented speaks of the relationship between the settings for leaving the vehicle departure place and the driver's performance on them has a completely positive effect.

As indicated in the division of shades for theory tree, the outline that I presented speaks of the relationship between the vehicle innovations used leaving space and the satisfaction of the driver with them, in principle, there is no positive effect. Therefore, progress made at stopping places does not build drivers' satisfaction. Therefore, the theory "There is a positive relationship between the progress provided by the avid vehicle pairing platform and driver performance" was rejected.

Chapter Five Conclusion

Parking has been and currently something that affects everybody in the society from street dwellers, day to day drivers as well as traffic officers. The monitoring methods have proved to be faulty and therefore a need for new or refreshed system has become necessary not only for now, but also for the future. This study has found that using the planned improved methodologies there will be a number of benefits from increased incomes to improved security as well as customer satisfaction.

The proper engagement between management bodies and other stakeholders, as well as the advanced control systems using simple yet reliable technologies will drive monitoring stresses out of our way By deploying systems which are more effective than the existing ones, vehicles violating rules will be easily detected through the automatic detection of parked vehicles as well as the social responsibility. With more obstacles coming from conflicts with aggressive customers and changes in weather conditions, it is necessary that the authorities introduce better but simple methods to attract more people to obey the rules. The use of sensor networks as well as higher fines will not only drive stresses out of operators' employees, but also will force people to remain orderly.

Recommendations

Smart parking causes probably the most concerning issue on driving in urban regions, discovering empty parking spots and controlling unlawful parking1). At the point when conveyed as a system, smart parking thus decreases the car emissions in urban focuses by decreasing the requirement for individuals to unnecessarily circle city squares looking for parking. It likewise allows urban communities to deliberately deal with their parking supply. Smart parking systems generally obtain data about accessible parking spots in a commercial area and procedure accessible positions for vehicles. It includes utilizing sensors, real-time information accumulation and cell phone- empowered payment systems that user able to seat parking in approach or very correctly anticipate where users will probably discover a spot.

Normally, the utilization of advanced mobile phones is so regular for the people groups with having the internet. Thus, this proposed application named “Park Easily” as Android Web App (mobile app) that helped residents as well as drivers for other cities or visitors for finding the parking spots. In the “Park Easily” App, clients can enter the zones location of a spot where they needed to reach or the stopping place in a specific area in the urban city, or spots from which they achieve his or her goal by traveling. And the flow chart of the procedure is appeared in figure 24. It gives the simple parking spots by utilizing this strategy that enable individuals to save parking ahead of time or all around precisely anticipate where they will probably discover a spot. At the point when conveyed as a system, smart parking decreases the discharge of fuel wastage by diminishing unnecessarily hovers in city hinder for looking through stopping. By utilizing this application, different clients close-by will see that spot opportunity on the cell phones or Pcs, with leaving time of the first driver, if that they search the region.

The application can extend to urban communities across the country and travel data about time-table, hold up, mishaps and furthermore the state of the traffic of the course and give different navigation of parking. The ordinary flow chart of the utilizing procedure of smart parking framework is appeared in the figure 24. This proposed method of utilizing android application presents a framework that will be recognize the accessibility of the vehicle parking and demonstrates the drive where the vehicle parking spots are accessible.

In this system, a camera is utilized with a sensor to take photographs to demonstrate the inhabitant of vehicle leaves. The camera can distinguish the nearness of numerous vehicles without a moments delay. Likewise, the camera can be effectively move to distinguish distinctive vehicle parking garages. By having this picture, the specific vehicle leaves empty can be known and after that the prepared data was utilized to control a driver to an accessible vehicle leave instead of sitting around idly to discover the space (2). The camera distinguishes the empty spaces of leaving and appeared on the screen with green circles are put on the empty vehicle parks. Green circle enables clients with the goal that clients to adapt either a vehicle is parked in a vacant space or not on the off chance that there is a vehicle on the spot, at that point the green circle won't be seen. (3) The proposed framework has been created in both programming and equipment stage as demonstrated the working procedure of this system. Either uses are at shopping at shopping complex, hotel, airport or any commercial places it doesn't make any differences made for the parking by utilizing this android application (APP). This method will manage effectively from application and gives defecation answer for parking. It gives dependable data about the use of parking spots.[CITATION DrF16 \l 1033]

Creating keen parking arrangements inside a city require institutionalized information and administration; mobile phone combination; hardware and software revolution; partnership between varied stakeholders alike as, urban cities transportation experts, owners of parking facilities, clients and program developers. These specialized arrangements and stakeholder are similar information structures and improvement bunches fundamental to building a smart hone enabled, multimodal, completely racially mixed transportation arrangement a reality. Essentially, the specialized scientific supporter and multi-stakeholder unity exertion behind advancement of a smart parking emulsion makes a platform towards full transportation system integration. The smart parking can really change of urban landscapes, creating them more manageable to individuals as opposed to vehicles with the approach of smart parking and mobility options to private vehicles, better utilization of existing parking will drive diminished interest for the urban cities parking spot surplus and for external parking. Urban communities can further quicken this framework by refreshing construction laws and land use arrangements to reflect diminished requirement for parking, a move which drives down structure costs and supports, progressively differed improvement choices. At last, urban spaces can wind up greener, cleaner, progressively

minimal, and all the more characteristically walk-able, bicycle capable and useful by a multimodal transportation framework.

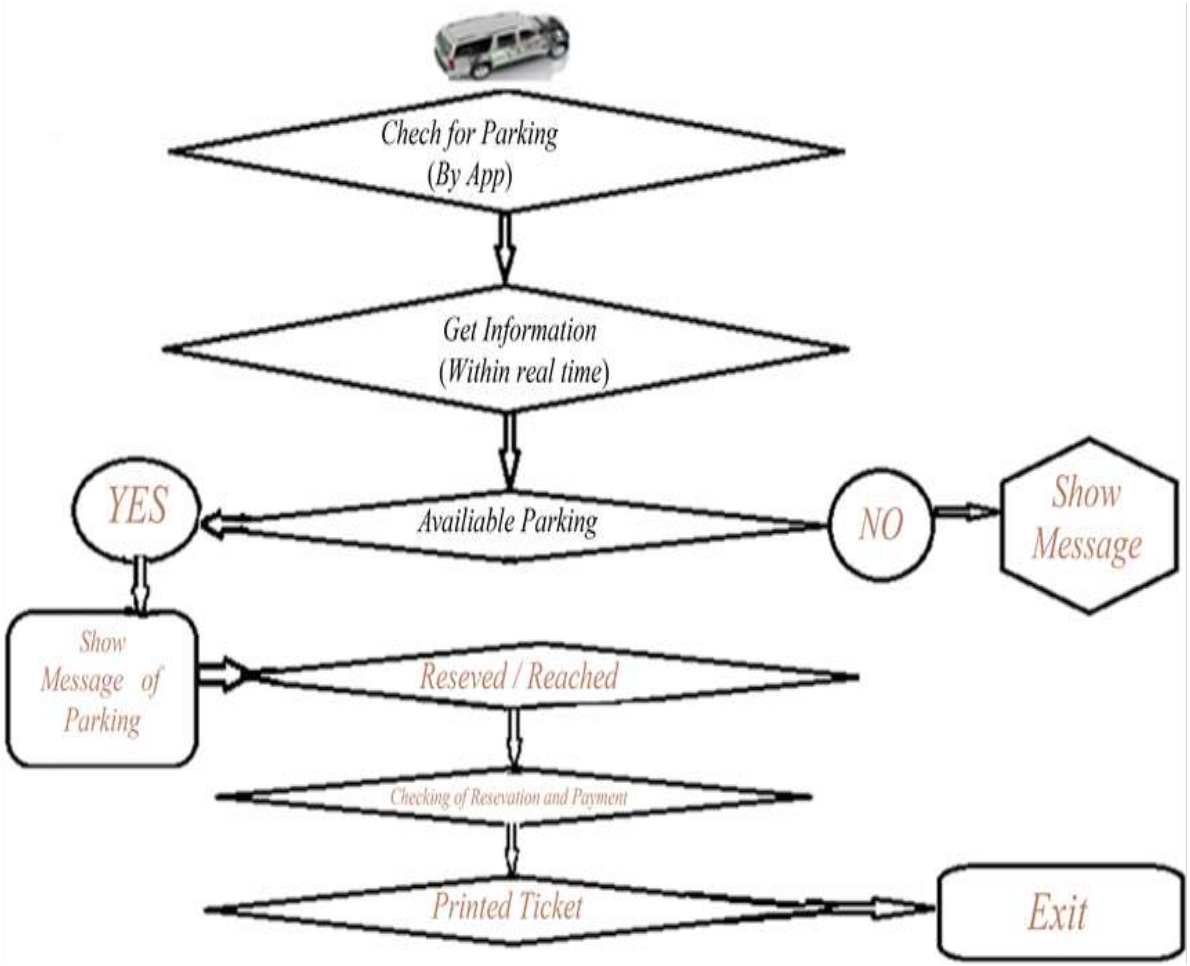


Figure 12 Flow chart of the smart parking system

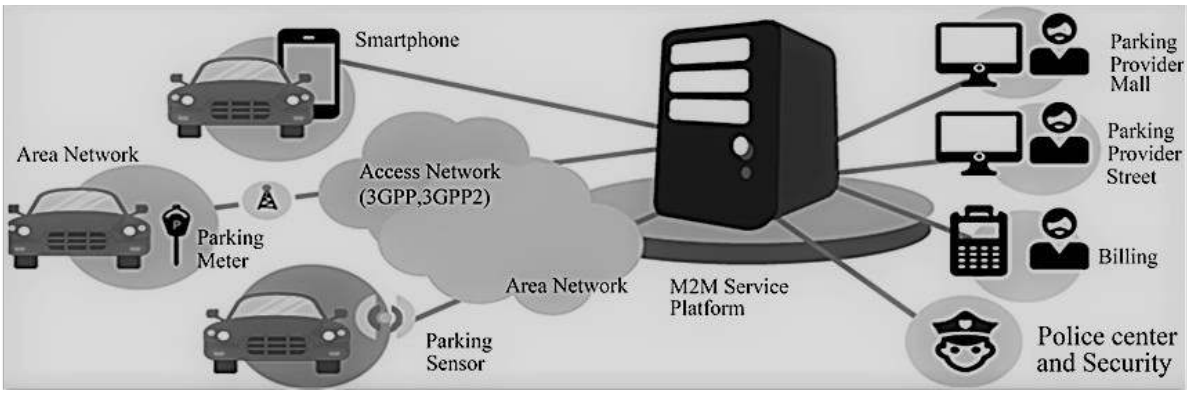


Figure 13 Parking information management structure

Recommended Mobile application

The world has encountered huge improvement in advancements of technologies. There has been the presentation of different highlights planned for facilitating the manner in which individuals can get important services. The introducing of Pcs, tablets, windows mobile and android technology has the again expedited other energizing minutes how innovation can change lives consistently there are new applications with clients. Parking must become automated and self-controlled, yet at the same time benefits when parking should be user friendly on an overcrowded day or a busy day in urban areas, it is usual to see drivers waiting in a queue that they can pay for parking. The application can be to such an extent that is accessible for even without registration. To discourage users from the payment machines, the online strategy can have rebate and this will likewise urge individuals to utilize it all the more regularly.

Advantages of proposed smart parking app

No requirement for money/ coin or bank cards when making or exchange.

Protected and helpful particularly when you have a record, as it dispenses with a large portion of the procedure.

Probability of broadening time remotely.

Dispenses with administrative work all things considered.

No compel lining reason to escape the vehicle and move back and forth the machine to buy parking time (pay at the easy and safe spot in your vehicle) No queue, no traffic and most importantly no environment pollution happen.

On the off chance that somebody is fined unintentionally (stat the parking user forgot to show the card or receipt) engaging is simple as it includes just sending the duplicate or installment to the observing office.

Below I have shown the wireframe diagrams of the mobile app. It consists of find a parking sport, payments option, notifications and track vehicle. By these options smart parking system become more user friendly with the smart parking mobile app.

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