**QUEUE MANAGEMENT SYSTEM**

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1. **INTRODUCTION**

In Our Generation wherein almost all people using new technology, it gives a good life to make it easy of what we do. And to use new technology it makes our time fast. Time management can help to prevent waste of time.

Time is very important to us, so to make it worth it we need to have automatic system. A system to provide our time faster and easy. As we observe in our campus society during the examination pay there’s a lot of students who did not take their exam in exact time due to slow manage processing in accounting area. And also it makes our time wasting waiting for so long lane. Fact of the Human condition that waiting causes frustration and annoyance.

As we search about the problem that we want to solve. According to Austria.L., published December 5, 2015 “Problems regarding waiting line in quick service has been one of the main concerns of industries and scholars nowadays”. It is because people today demand the speed quick service.

Waiting for how many hours is already considered as waste of time specially, to those students who will need to attend their classes in the morning. The employees and customers who have a transaction in our campus they also experience. Sometimes some students get angry or misunderstanding in other because of unorganized lane.

Manage expectations; lines to keep students, Employees and Customers happily in go. To give people a sense of control and make very easy and fulfilling as possible, to show that you respect and value them as a students, employees, and customers. A system solution is used to make the waiting experience better for students, employees, and customers.

1. **LITERATURE REVIEW**

* According to Adan.I., and Resing.J., written March 26,2015 the Queue model with exponential inter arrival times with mean, exponential service times with mean and parallel identical servers. Customers are served in order of arrival and they supposed that the occupation rate per serve is smaller than one.
* According to Upton.E., and Halfacree.G., first published 2012 the Raspberry Pi is better suited for projects that don’t require any a huge amount of processing power and will benefit from the lighter weight/smaller size. This includes projects such as robotics, remote control planes/cars and embedded projects.  To just name a few examples it would make for a great robot brain, touchscreen car dashboard, motion sensing camera and much more.
* According to Upton.E., and Halfacree.G., first published 2012 the HDMI (High Definition Multimedia Interface) connector, the only port found on the bottom of the Pi (see Figure 1-3). Unlike the analogue composite connection, the HDMI port provides a high-speed digital connection for pixel-perfect pictures on both computer monitors and high-definition TV sets. Using the HDMI port, a Pi can display images at the Full HD 1920x1080 resolution of most modern HDTV sets. At this resolution, significantly more detail is available on the screen.
* According to W.Durfee., The Arduino microcontroller is an easy to use yet powerful single board computer that has gained considerable traction in the hobby and professional market. The Arduino is open-source, which means hardware is reasonably priced and development software is free. The Arduino project was started in Italy to develop low cost hardware for interaction design
* According to ZF Friedrichshafen.AG., 2011 Our rocker switches are used in a large number of applications ranging from household appliances and power tools to industrial machines and plant equipment. Cherry rocker switches are the perfect choice for economical, compact switching, in current ratings of up to 20 amperes. They are available in a wide variety of shapes and colors, in lighted and non-lighted designs, and with different switch characteristics, electrical ratings and protection classes.
* According to Phillip Burgess (adafruit Learning System 2016) Add a mini printer to any microcontroller project with this very cute thermal printer. Also known as receipt printers, they’re what you see at the ATM or grocery store. Now you can embed a little printer of your own into an enclosure. This printer is ideal for interfacing with a microcontroller, you simply need a 3.3V to 5V TTL serial output from your microcontroller to print text, barcodes, bitmap graphics, even a QR code!

**THE 5 QUEUE SYSTEM**

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| Q Calling System | Description: E:\Program Files\Microsoft Office\MEDIA\OFFICE14\Bullets\BD21301_.gif |  |  | Description: E:\Program Files\Microsoft Office\MEDIA\OFFICE14\Bullets\BD21301_.gif |
| Q-Nomy’s Queue Management system |  | Description: E:\Program Files\Microsoft Office\MEDIA\OFFICE14\Bullets\BD21301_.gif |  | Description: E:\Program Files\Microsoft Office\MEDIA\OFFICE14\Bullets\BD21301_.gif |
| Restaurant Queue Management System | Description: E:\Program Files\Microsoft Office\MEDIA\OFFICE14\Bullets\BD21301_.gif | Description: E:\Program Files\Microsoft Office\MEDIA\OFFICE14\Bullets\BD21301_.gif | Description: E:\Program Files\Microsoft Office\MEDIA\OFFICE14\Bullets\BD21301_.gif |  |
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1. **STATEMENT OF THE PURPOSE**

People nowadays are demanding of faster transaction or services. The purpose of this project is to design and develop a queue system in our campus and organize the waiting line in accounting/registrar. The following objectives are:

1. To study the terminologies and data about queuing
2. To reduce the flow of human traffic and long queues.
3. To promote the use of this system
4. To test and evaluate the system
5. **THEORETICAL FRAMEWORK**

**QUEUEING THEORY**

Wikipedia defines queuing theory as, “. the mathematical study of waiting lines (or queues)” [5]. These theories allows for the mathematical analysis of several related processes, including entering the queue, waiting in the queue and exiting the queue. Wikipedia continues to state that, “The theory permits the derivation and calculation of several performance measures including the average waiting time in the queue or the system, the expected number waiting or receiving service and the probability of encountering the system in certain states, such as empty, full, having an available server or having to wait a certain time to be served”

**QUEUING MODEL**

“In queuing theory, a queuing model is used to approximate a real queuing situation or system, so the queuing behavior can be analyzed mathematically. Queuing models allow a number of useful steady state performance measures to be determined, including: the average number in the queue, or the system, the average time spent in the queue, or the system, the statistical distribution of those numbers or times, the probability the queue is full, or empty, and the probability of finding the system in a particular state

**SOFTWARE DEVELOPMENT LIFE CYCLE**

SDLC, Software Development Life Cycle is a process used by software industry to design, develop and test high quality software’s. The SDLC aims to produce high quality software that meets or exceeds customer expectations, reaches completion within times and cost estimates.

SDLC is a process followed for a software project, within a software organization. It consists of a detailed plan describing how to develop, maintain, replace and alter or enhance specific software. The life cycle defines a methodology for improving the quality of software and the overall development process.

**WATERFALL MODEL**

The Waterfall Model was first Process Model to be introduced. It is also referred to as a linear-sequential life cycle model. It is very simple to understand and use. In a waterfall model, each phase must be completed before the next phase can begin and there is no overlapping in the phases.

Maintenance

Deployment of system

Integration and Testing

Implementation

System Design

Requirement Gathering and analysis

1. **SIGNIFICANCE OF THE STUDY**

**Users/Costumer**

Prefer the faster and yet effective Queue System in restaurants, companies, schools and etc. People can adjust to their schedules or on their time while waiting mostly in lines. They can do other stuffs while waiting because they knew that if they are going to be next or they are still too far from the counter.

**The Olivarez College**

This study will benefit the school for them to be organized and yet formal when there is prestigious events in a school.

**Paranaque City**

Cities can be progressive if the companies that they have are using a better queue system. It can be a culture for the people living in a city with a queue system so that they are aware and they can plan for their schedules every day in every company.

1. **Operational Definition of Terms**

**Arduino** - is an easy to use yet powerful single board computer that has gained considerable traction in the hobby and professional market.

**Arrival Rate** – The average number of arriving per time period

**Linux** – it is the type of operating system of Raspberry Pi 3 b model

**Monitor** – it is the hardware we were going to use for visual system

**Multiple-Channel Queuing system** – it is a type of system we were going to use which the service system with one waiting line but with several servers.

Programming -

**Queue** – to define a waiting line

**Service Rate** – The average number of costumers that can be served per time period

**Single-Phase System** – it is a type of system we were going to use in which the customer receives service from only one station and then exits the system

Switch

**Ticket** – this serves as the waiting number of a costumer for them to see if they are next or they are going to wait for a while.

**USB Cable** – this cable will connect the Arduino and raspberry pi.

**Visual System** – it is the type of system which we are going to use a monitor to see if what number is next.

**Virtual queuing** – It is the type of queue management which is a visual type of system

**FIFO** – First In, First Out

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