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QUEUING MANAGEMENT SYSTEM IN MANUEL S. ENVERGA UNIVERSITY FOUNDATION CANDELARIA INC.

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Abstract: Queue management in schools is becoming more and more important for improving the general student experience and making administrative tasks run more smoothly. This abstract shows everything you need to know about the Queuing Management System in Manuel S Enverga University Foundation Candelaria, Inc. In order to improve user satisfaction, shorten wait times, streamline the queuing process, and boost productivity, this study examines the use and impact of queueing management systems in educational institutions. By digitiizing the queuing process, these systems offer several benefits. Students can join virtual queues, eliminating the need to physically wait in line, which saves them time and enhances their satisfaction with administrative processes. Instead of focusing their efforts on staffing lines, faculty and administrative personnel can handle queues more effectively and help students. The technique also improves data accuracy and offers insightful information about queue patterns, which aids in the decision-making process for schools looking to improve services. Delivering a fully functional and flexible Queue Management System that greatly improves the effectiveness of queue management across multiple lines and apps on campus is the primary objective of this study.

Keywords: Queing, Management, system

Introduction

Waiting in long lines has become a common source of frustration for many people in today's fast-paced world, where time is of the key. The growing needs of modern society have made it more important to find efficient ways to cut down on long lines and improve the overall customer experience for example have you ever been in a situation where you

had to stand and wait for a long time the kind in which you start to feel hungry but are unable to leave your line because you are concerned that someone will pass you on their way to the front of the queue. These are just some of the many reasons why the user doesn't like having to wait in extremely long lines. In recent years, the increasing demands of modern society have led to the development of technology that is intended to simplify various aspects of daily life. One of the areas that have been greatly influenced by technology is the educational sector. With the aim of improving the quality of education, schools are increasingly adopting technology-based solutions to manage their day-to-day operations. One such solution is the queue tracking management system.

The queue tracking management system is a tool designed to manage queues and lines, and it has become an essential tool in various service-oriented industries, including the educational sector. In a school setting, queue tracking management systems are used to manage the flow of students, faculty, and other individuals in a much more effective way. The purpose of this thesis is to examine the use of queue tracking management systems in schools and the impact they have on the overall school experience.

Traditional queuing systems in schools are often inefficient and time-consuming, leading to long wait times. The use of queue tracking management systems provides an alternative solution that addresses these challenges by digitizing the queuing process and making it more organized and efficient. The system tracks the flow of individuals in a queue, providing real-time information on wait times, service status, and other relevant details. This helps manage the flow of people in a more organized way, making the school run more smoothly and making the school experience better for everyone.

Background of the Problem

In today's educational schools the queuing is still using a traditional method involving physical lines and waiting processes is used for various services, including Registrar, Cashier and administrative offices. Manuel S. Enverga University Foundation Candelaria Inc. are still using the same process which is the manually queuing system. For this manual way to work well, both students and staff must work together and follow the rules. But because the system is manually, sometimes there are long wait times, schedule delays, and traffic jams in high- traffic areas, which means that school staff must keep an eye on things at all times. Schools have been thinking more and more about digital alternatives to the usual way of waiting in lines by hand. The first automated queue systems were used in the late 20th century, mostly in banks and other companies that focus on customer service. The rapid evolution of technology has resulted in advanced systems that use mobile devices, the web, and sophisticated algorithms to handle queues more efficiently.

Automated queuing solutions have gained fame in educational settings due to the disadvantages connected to manual systems, such as delays, inefficiency, and possible

health risks. The widespread access to smartphones and the internet has allowed schools to explore digital solutions that easily integrate into existing processes. These solutions can take the form of smartphone apps, web-based platforms, or standalone kiosks, allowing students to virtually join queues and receive real-time updates on wait times. By removing the need for students to physically stand in line the educational institutions can ease overcrowding, reduce stress levels, and promote a more orderly environment. This change will not only help the students, but it will also free up teachers and administrative staff from having to manage real lines. This will let them focus on more important tasks. Additionally, automated queuing systems support a safer and more hygienic environment, especially during public health crises like the COVID-19 pandemic.

As schools continue to adopt automated queuing systems, these solutions will likely become a key element of the modern educational experience. By incorporating technology and innovation, schools can create a more efficient and satisfying atmosphere for students, staff, and the wider community.

Statement of the problem

In the context of managing queues and wait times at Manuel S. Enverga University Foundation Candelaria, Inc. (MSEUFCI), there are significant challenges that need to be addressed through the development of an effective Queue Management System (QMS). Traditional queue management techniques used by educational institutions frequently result in errors and inefficiencies due to manual processes, a lack of real-time communication, and fragmented data. The installation of a comprehensive Queue Management System is essential to resolving these problems and improving the MSEUFCI queue management experience.

Problem Statement

The current state of the queueing management system has a number of significant issues that make it difficult to organize and execute process successfully. These issues include:

1. **Manual Procedures:** The reliance on manual queuing processes, including registration, tracking, and communication, results in errors, delays, and increased administrative burden.
2. **Communication Gaps:** Inadequate communication channels and real-time collaboration tools hinder effective coordination among school administrators, students, faculty, and stakeholders, leading to misunderstandings and operational disruptions.
3. **Data Fragmentation:** Queue-related data is often scattered across various platforms and systems, creating data fragmentation. This fragmentation complicates decision-making processes and contributes to data inaccuracies.
4. **Limited Scalability:** Traditional queuing methods struggle to adapt to the evolving and diverse needs of educational institutions like MSEUFCI, especially when dealing with complex and varied demands.

Objectives of the Queue Management System:

The primary goals of implementing the Queue Management System at MSEUFCI are as follows:

1. **Automation:** Implement automation in queue management processes, including queueing and service tracking, to reduce manual efforts and enhance operational efficiency.
2. **Unified Communication:** Establish a centralized, real-time communication system that facilitates seamless collaboration among school administrators, students, faculty, and other stakeholders.
3. **Data Integration:** Develop a system that integrates and consolidates queue related data, providing a comprehensive and accurate understanding of relevant information for informed decision-making.
4. **Scalability:** Design the Queue Management System to be flexible and scalable, capable of adapting to the diverse requirements of MSEUFCI and accommodating future growth.

Benefits

The successful implementation of the Queue Management System at MSEUFCI promises several benefits:

1. **Reduced Wait Times:** The Queueing Management System cuts down on the time individuals spend waiting in line, leading to a more pleasant and efficient experience for both students and staff.
2. **Enhanced Student Satisfaction:** Shorter wait times and improved organization in queues lead to satisfied students and a more positive school experience.
3. **Increased Staff Efficiency:** With a streamlined way to handle queues, school staff can spend more time assisting students and less time managing lines, boosting overall efficiency.
4. **Data Accuracy:** The system improves the accuracy of data collection and reduces the likelihood of errors in queue management.
5. **Informed Decision-Making:** Integrated data provides valuable insights into queue patterns and trends, helping administrators make informed decisions about resource allocation and service improvements.
6. **Improved Visitor Experience:** Visitors, including potential students and their families, benefit from a more organized and efficient school environment, leaving a positive impression.

Main and Specific Objectives

The main objective of this research is to develop a comprehensive and efficient Queue Tracking Management System that will optimize the queuing process, reduce waiting time, enhance customer satisfaction, and increase productivity at MSEUFCI. The system will enable users to manage queues and appointments efficiently, generate reports on queue management, monitor queue progress in real-time, save and view the records of Que, and provide a user-friendly interface for both staff and students. The end goal of this project is to deliver a fully functional and scalable Queue Tracking Management System that will significantly improve the efficiency of queue management across various lines and uses in campus.

Specific Objectives

1. To evaluate the current traditional queuing system in use in the selected school and figure out where it's not working well and what's causing delays. This goal will involve analyzing the school's current queuing system, including the processes and technology used, the types of services and tasks that require waiting in line, and how waiting in line affects student satisfaction and involvement. Through this evaluation, the goal is to find out where the current system is lacking and what causes inefficiency, delays, and dissatisfaction among individuals and students.

2. To look at the most important parts and functions of queue tracking management systems and judge how well they might work to fix the problems with the current queueing system. This goal will require research and analysis of the features and functions of queue tracking management systems, such

as the hardware and software components, the user interface, and the ability to manage and analyze data. The goal of this review is to figure
out how well a queue tracking and management system might be able to fix the problems that have been found with the current system and make waiting in line better for everyone.
3. To figure out how the queue tracking management system affects school operations, such as wait times, service delivery, and the satisfaction of staff and students. This goal will involve figuring out how the queue tracking and management system affects school operations, such as the length of wait times, the quality of service, and the satisfaction of both staff and students. The goal of this evaluation is to figure out how well the system fixes the problems with the current way of waiting in line and improves the school experience as a whole.
4. To find ways that the school's queue tracking and management system could be improved and to make suggestions for further development and use. This goal is to find out where the queue tracking management system at the chosen school could be improved, such as if it needs more features, more training or technical support, or better data management and analysis. With this information, the goal is to make suggestions for further development and use of the system, including the possibility of expanding it to other schools or educational institutions.

Overall, the goals of this study are to give a thorough and detailed analysis of how queue tracking management systems are used in schools and to offer insights and suggestions for schools that are thinking about using such systems. Through these goals, the thesis aims to add to the growing body of research on technology-based solutions in the education sector and give valuable information to schools that want to improve their operations and make the school experience better for all of their stakeholders.

Significance of the study

The Queuing management system (QMS) is a system that streamline the queuing process and runs the task more smoothly. The following are the target beneficiaries of the QMS.

1. School Administrators: The study can assist school administrators in determining how to increase the efficiency of their queuing system in order to enhance the overall quality of the educational experience for students. The study can assist school administrators in streamlining their processes, reducing the amount of time students have to wait, and increasing student satisfaction by pointing out areas in which things aren't working properly and offering suggestions for how to improve the issues.

Teachers and Staff: The study may benefit faculty members and staff members in managing lines and lineups in a manner that is more effective and well-organized. Teachers and other staff members can spend less time monitoring lines and more time providing students and other stakeholders with quality service if they have access to a system that keeps track of those lines.

3. Students and Parents: Students and parents both stand to gain from the findings of this study, which have the potential to cut down on wait times and make it easier to access school services. Students and parents are able to more efficiently arrange their time and avoid wasting time waiting in lines because real-time updates on wait times and service status are provided.

4. Researchers: The research may make a significant contribution to the increasing amount of research on technology-based solutions in the field of education. This study has the potential to provide significant insights and recommendations for the continuation of research and development in this field by analyzing the adoption and effectiveness of queue tracking management systems in schools.

5. Future Researchers: The findings and suggestions offered by this study can be used by researchers in the future to expand upon the work they have already accomplished. They can contribute to the analysis of the study by comparing how well queue tracking management systems operate in various kinds of schools or educational institutions, or by investigating how these systems will affect student satisfaction and school performance in the near future.

Scope and Limitations

Scope

The goal of the school's queue tracking and management system is to make the school's administrative processes run more smoothly by giving them a streamlined way to handle lines or queues. Students and staff should be able to easily join a line or queue for different school services and see where they are in real time.

1. **Queue creation and management**: The system should allow school administrators to create queues for various services, like student registration, payment, counseling, and health services for students. The system should also let them manage the lines, such as by setting the number of people who can be in a line and the level of priority.
2. **Queue joining and tracking**: The system should also display the number of people in line. Students and staff can join the line using the system's web or mobile app, which lets them see where they are in the line. This feature eliminates the need for physical line ups and saves time for students and staff.
3. **Notification and alerts**: With this feature, the system can let students and other individuals know when it's their turn to get service or when they're getting close to the front of the line. The system can send alerts by email, text message, or other way. This feature helps students and other individuals to stay informed about their queue status and reduces the need for them to wait in the queue
4. **User management**: Administrators at the school can use this functionality to manage user accounts, including the creation of new accounts, password resets, and user role and permission management. By preventing illegal access to the system, this feature helps in protecting the security and privacy of user data.
5. **Security and privacy**: The security and privacy of user data, including personal data and queue status, is ensured by this feature. The system should implement secure methods for data storage and transport. This function aids in preserving user information confidentiality and preventing unauthorized access to sensitive data.
6. **Queue reporting and analytics:** This feature enables the system to generate comprehensive reports that provide insights into the waiting time and processing time of each queue. School administrators can access these reports to analyze queue performance, identify bottlenecks, and make informed decisions for improving overall
efficiency. By capturing and analyzing such data, the system empowers administrators to optimize queue management

strategies and enhance the overall user experience.

Limitations:

1. Reduces wait Time in all cases: The system cannot always shorten wait times in all cases. Some services may be in high demand, so they may need more services, which could make wait times longer. For example during peak registration periods the system might help keep lines moving but it can't always get rid of waiting completely.

2. Guarantee system uptime: Even though the system can offer high availability, it can't promise to be up 100% of the time. There could be downtime if the network fails, there are bugs in the software, or there are problems with the hardware. For example, if the system's network goes down, students and staff might not be able to use it and might have to use a backup system instead.

3. **Replace manual processes entirely:** Even though the system can help automate and streamline processes, it can't take the place of manual processes entirely. Schools still need to have backup systems and processes in place in case a system goes down or other problems arise.

Review of Related Conceptual Literature

Introduction

In our fast-paced business era, it's crucial for businesses to manage queues effectively and keep customers smiling. Businesses are always searching for fresh approaches to enhance their line systems so folks aren't left hanging for ages. This piece shares a smart new way to solve these challenges. The aim is to create a solution that's speedy, solid, and can adjust to different situations like in shopping centers, banks, or medical centers. The write-up digs into how this fresh system functions, its practical use in real-life scenarios, and its pros and cons.

Expert Queuing System Using Statistical Analysis and Fuzzy Logic Technique

In today's world, many businesses need to have good line management and great customer service. Companies are always looking for a new ways to improve their management in queuing systems so they can offer better and much reliable services to cut down on the time that they have to wait. This piece talks about a creative way to deal with these problems. With this the goal is to make a solution that is fast, strong, and flexible for dealing with lines in shopping, banking, healthcare, and other areas. Overall, the article looks at the proposed system's the theory, methods and real uses of it in queuing, as well as its pros and cons. Their que management system uses advanced analytics and smart algorithms to make customers happier and make operations run more smoothly in different service settings.

Introduction

Ever considered a scenario where people no longer have to endure long lines at institutions like schools or clinics? Queue Management Systems (QMS) can make this scenario a reality. They are designed to oversee queues in various venues, minimize waiting periods, and ensure efficient service delivery. In the user-friendly guide called "What is Queue Management?", one will find out how QMS operates, the equipment it employs, and how it communicates. The guide also highlights new advancements like queuing virtually via a mobile device or utilizing self-service kiosks. It presents evidence from expert studies showing how QMS has improved service delivery and increased customer satisfaction.

What is Queuing Management System

It is a system that helps the service companies like school, clinic and any other establishment that has a que because it keep track of their customers que and cut down on the time they have to wait. To make sure customers have a smooth experience, the system is made up of different parts, such as hardware, software, and communication networks. QMS helps service providers give the best service possible by reducing wait times, improving service quality, and making customers happier overall. Based on this article with the title what is Que Management? Several studies have shown how QMS affects how services are delivered and how happy customers are. For example, QMS helps service providers keep track of and handle customer lines. This means that customers wait less and get better service. QMS also gives service providers real-time data and analytics, which help them find service bottlenecks and make their processes run more smoothly. Also, QMS has changed over time, and there are now different kinds of QMS like virtual queueing, mobile queueing, and self-service stations. Each type of QMS has its own features and benefits that make it good for a certain type of service setting. For example, virtual queuing works well in service settings with long wait times, while self-service kiosks work best in service settings with a lot of people.

Introduction

This article takes a closer look at different kinds of queues and how they are managed. The spotlight is on a unique model that uses text messages to keep patients informed helping to reduce wait times and make booking appointments from afar easier. The suggested solution is a handy Android app that allows patients to schedule appointments and find their way to the nearest hospital. The piece draws a line between well-organized, predictable queues and less orderly, unpredictable ones, and looks at various ways to handle queues, like physical barriers, signs, and automatic queue measuring systems. The proposed system comes with lots of benefits, like being user-friendly, reachable from anywhere with a mobile network, working with any mobile phone that can handle text messages, saving time, and being budget-friendly, all without the need for an internet connection or a dedicated computer link.

Survey on Patient Queue Management System

In an effort to improve patient experience and reduce waiting times in healthcare settings, the article (A Survey on Patient Queue Management System) investigates various queue types and queue management systems, focusing on a model that sends SMS notifications to patients. It looks at different types of queues and ways to handle them. It focuses on an idea that sends SMS messages to patients in medical facilities to cut down on wait times and make it easier for them to schedule appointments from afar. The proposed solution is an Android app that lets patients make appointments and get directions to the nearby hospital. The literature study makes a distinction between structured, predictable queues and unorganized less predictable queues. It also looks at different ways to handle queues, such as physical barriers, signs and signals, and automated queue measuring systems. The suggested system has many benefits, such as being easy to use, accessible from anywhere with a GSM network, compatible with any GSM phone that supports SMS, saving time without needing internet access or a dedicated computer connection, being cost-effective, mobile, and confirming that commands were carried out. In

conclusion, you need to know a lot about queue systems to make a good patient wait management system. The system uses SMS services and an Android app to let patients make appointments, get reminders, and find their way to the hospital. Even though the current methods for managing lines have been helpful, there is still room for improvement to make the system run more smoothly.

Introduction

Handling customer lines or queue often known as queue management is a big deal when it comes to making customer experiences better keeping customers happy, and making sure they come back. This article discuss on how long waits can make customers see things in a negative light leading to less happiness and possibly losing business. And that's why it is so important to manage the queues well in order to cut down on wait times and make staff more productive and efficient, and make the customer experience better. The writing also points out that it's key to include things like keeping an eye on queues in real-time, letting the customers know what's going on and making the queues better in queue management systems.

Queue Management

The current "Queue Management" article defines and highlights the significance of queue management in service centers. It describes queue management as the process of managing customer queues or waiting lines, a crucial element for enhancing customer
experience, satisfaction, and retention. The article emphasizes the negative perception that customers have of lengthy wait periods, which leads to lower satisfaction and the risk of losing business. Therefore, effective queue management is essential for minimizing wait times, boosting staff productivity and efficiency, and enhancing the customer experience. It's also emphasizes the significance of incorporating important features such as real-time queue monitoring, data analytics, customer notifications, and queue optimization into queue management systems. And lastly its illustrates that in today's fast paced world, queue management systems are no longer a luxury but a necessity. In its conclusion, the article gives a brief but useful summary of how important queue management is and why service centers need to use effective queue management systems to make customers happier and improve their business's overall performance.

Review of Related Research and Studies

Introduction

People know that the concept of queues has had a big impact on improving service delivery and making patients' experiences better in many fields, including healthcare. Waiting lines or queues are a common part of our daily lives. They can be found in banks, hospitals, transportation hubs, and service centers, among other places. The negative effects of long wait times, like unhappy customers and inefficient operations, make it important for these businesses to handle their lines well. Queueing theory is especially useful in healthcare settings because it helps find places where people are waiting too long and makes the best use of resources. High patient volumes lead to longer wait times and less patient satisfaction. Healthcare workers and researchers can use the theory of
queues to look at service processes, find bottlenecks, and suggest ways to improve patient flow and shorten wait times. This method will lead to better service delivery and a better experience for patients in the long run.

An Analysis on Patients' Queuing System at Muhammad Abdullahi Wase Specialist Hospital, kano

Abstract

Hospital congestion poses a significant challenge, leading to long queues and delays in service delivery, adversely impacting patients. This study aims to minimize patient waiting times by comparing the performance of single-server and multi-server models at the Pediatrics Department of Muhammad Abdullahi Wase Specialist Hospital Kano (MAWSHK). Primary data was collected through direct observation
and analyzed using goodness-of-fit tests to determine the best data distribution. Performance indicators, including utilization factor, average queue and system size, and average waiting times, were computed and compared for both models. Results suggest that the multi-server model, specifically the G/G/4 model, outperforms the single-server model by minimizing patient waiting times.

Findings

The analysis conducted at the Pediatrics Department of Muhammad Abdullahi Wase Specialist Hospital in Kano revealed important findings regarding the queuing system. The study found that the arrival times of patients and service durations at the department follow a general distribution, allowing for flexibility in modeling. When
comparing different server configurations, it was observed that increasing the number of servers led to significant improvements in performance indicators such as average queue size, average system size, average waiting time in the queue, and average waiting time in the system. The utilization factor, representing the percentage of time servers were busy, decreased as the number of servers increased, indicating better resource utilization. Notably, the multi-server configuration demonstrated a considerable reduction in patient waiting times compared to the single-server configuration, addressing congestion and improving patient experience. However, it is essential to consider the cost implications of implementing additional servers to achieve a balance between service delivery improvement and cost-effectiveness. These findings emphasize the potential of queuing theory and multi-server configurations in optimizing patient flow and supporting decision making at the Pediatrics Department of the hospital.

Recommendations

Based on the findings of the study, the following recommendations are put forth to enhance the queuing system at the Pediatrics Department of Muhammad Abdullahi Wase Specialist Hospital in Kano: Firstly, it is advised to consider the implementation of a multi server configuration, as it has demonstrated the potential to reduce patient waiting times and mitigate congestion. It is crucial to conduct a comprehensive cost-effectiveness analysis to assess the financial viability of adding more servers. Additionally, optimizing server allocation based on the analysis of patient arrival patterns and demand fluctuations can help ensure efficient resource utilization. Continuous monitoring and evaluation of the
queuing system, including tracking key performance indicators and soliciting feedback from both patients and staff, will aid in identifying areas for improvement. Lastly, fostering a culture of continuous improvement and providing adequate training to staff members involved in the queuing

process will enhance operational efficiency and contribute to improved service delivery. By implementing these recommendations, the Pediatrics Department can enhance its queuing system and improve the overall patient experience.

Conclusion

In conclusion, the analysis conducted at the Pediatrics Department of a hospital in Kano provided valuable insights into the performance of the queuing system. The study revealed that the arrival times of patients and service durations followed a general distribution, enabling greater flexibility in modeling. Comparison of different server configurations demonstrated that increasing the number of servers yielded substantial improvements in key performance indicators, including average queue size, system size, waiting time in the queue, and waiting time in the system. These findings underscore the effectiveness of a multi-server configuration, particularly one with multiple servers, in reducing patient waiting times and mitigating congestion challenges. Implementing such a configuration can significantly enhance the overall efficiency of the queuing system and improve the patient experience. The study's contributions to queuing theory application within healthcare settings can inform decision-making processes and guide improvements in service delivery in similar departments or healthcare facilities.

Introduction

Patient satisfaction plays a crucial role in the delivery of healthcare services, especially in emergency departments where prompt and efficient care is essential. However, extended waiting times and chaotic systems can result in patient dissatisfaction and frustration. To tackle these challenges, the implementation of queue management systems (QMS) has emerged as a promising solution. By leveraging technology and streamlined processes, QMS aims to improve patient flow and enhance the overall experience within emergency departments.

Effect of Queue Management System on Patient Satisfaction in Emergency Department: a Randomized Controlled Trial

Abstract

This randomized controlled trial assessed the influence of a queue management system (QMS) on patient satisfaction within emergency departments. A comparison was conducted between an intervention group utilizing a QMS and a control group subject to the conventional waiting process. The results demonstrated that patients in the QMS group exhibited significantly higher satisfaction levels. This improvement was attributed to reduced waiting times, enhanced communication, and improved organization within the department. Additionally, patients in the QMS group perceived the staff as more knowledgeable, friendly, and efficient. The findings suggest that healthcare facilities should consider implementing a QMS to increase patient satisfaction by reducing wait times, facilitating communication, and optimizing the overall waiting area. Adequate training and education for staff members are vital to ensure a seamless integration of the QMS into existing practices. In conclusion, the implementation of a queue management
system in emergency departments can significantly enhance patient satisfaction, leading to improved healthcare experiences and outcomes.

Findings

The study revealed that the introduction of a queue management system in emergency departments had a significant positive impact on patient satisfaction. Patients who experienced the QMS reported shorter wait times, improved communication with staff, and a more organized waiting area. Moreover, they perceived the staff as more knowledgeable, friendly, and efficient in delivering care. Also, the study's results show that a queue management system not only makes patients satisfied, but also enhances the perception of staff competence and overall service efficiency. These good results show how QMS has the ability to change the way patients feel in emergency rooms for the better.

Recommendations

Based on the findings, it is recommended that healthcare facilities and emergency departments consider adopting a queue management system to enhance patient satisfaction. The implementation of a Queuing Management system can help reduce waiting times, facilitate better communication between staff and patients, and improve overall organization in the waiting area. Providing comprehensive training and education to the staff is crucial for a successful integration of the QMS into existing processes.

Conclusion

In conclusion, the introduction of a queue management system in emergency departments can significantly enhance patient satisfaction. The findings of this study underscore the importance of considering patient satisfaction in healthcare settings and highlight the potential benefits of implementing a QMS. By reducing wait times, improving communication, and optimizing the waiting area, a QMS can contribute to a better overall patient experience and potentially improve healthcare outcomes. Healthcare facilities should consider the implementation of QMS as part of their efforts to enhance patient satisfaction and ensure efficient service delivery.

Introduction

Reducing lines and wait times in hospital pharmacies is important for making patients pleased and making healthcare work better generally. This study, which was done by (Henry C. in 2014), looks into why people have to wait so long in a Nigerian hospital drugstore and suggests ways to fix the problem. By looking at things like staffing, infrastructure, processes, and how lines are handled, the study hopes to learn how to improve the patient experience and improve pharmacy services. The study shows how important it is to find and fix the underlying problems that lead to long wait times in hospitals.

Reducing queues in a Nigerian hospital pharmacy

Abstract

The study focuses on identifying the reasons behind long wait times and low patient satisfaction in a Nigerian hospital pharmacy. It explores possible factors such as
staffing shortages, inadequate infrastructure, ineffective procedures, and inefficient queue management. The research suggests potential solutions, including the implementation of a queue management system, hiring additional pharmacy staff, providing better training, utilizing automated queue management machines, improving pharmacy layout, and promoting collaboration with other healthcare providers. The objective is to improve the efficiency and effectiveness of pharmacy services, resulting in shorter wait times and increased patient satisfaction.

Findings

The study's results show that long wait times in Nigerian hospital pharmacies are caused by a number of important things. These include not having enough staff, not having the best infrastructure, not having the best processes, and not being able to handle lines well. Insufficient staffing numbers and poor training add to delays in dispensing medications, while inadequate infrastructure and layout prevent smooth patient flow. Procedures that don't work and bad queue management make the problem worse, leading to longer wait times and less happiness among patients.

Recommendations

Based on the identified issues the study proposes several recommendations to reduce queues and improve pharmacy services. Among them are putting in place the queue management system to improve patient flow, hiring more personnel to handle patient demand, giving thorough training to improve accuracy and efficiency,
implementing automated queue management machines to speed up the procedure, organizing the pharmacy better, and encouraging collaboration with other healthcare providers to share knowledge and best practices.

Conclusion

In the end, this study shows how important it is to figure out why hospital pharmacies have long lines. By using the suggested solutions like getting a queue management system and increasing staffing levels and training, using technology, improving infrastructure, and encouraging collaboration, hospitals can make patients satisfied on reduce wait times, and improve pharmacy services. Furthermore, continuous monitoring and evaluation of implemented strategies are essential to ensure their effectiveness and make necessary improvements. By putting service quality and patient happiness first, hospitals can set a standard for medical centers all over the world.

Introduction

The Virtual Queue Management System (VQMS) is a new way to deal with problems like long wait times and crowded lines at service centers. This study looks at the potential of VQMS and how it affects customer happiness, how lines are managed, and how productive a company is overall. By using mobile and web platforms, VQMS changes the standard way of waiting in line by letting customers join digital lines from anywhere, so they don't have to stand in lines. This introduction sets the stage for talking about the research study's abstract, findings, suggestions, and conclusion.

The research Virtual Queue Management System

Abstract

The study are focuses on introducing the Virtual Queue Management System (VQMS) as a cutting-edge way to reduce long wait times and crowded lines at service facilities. VQMS uses mobile and web tools in order to give customers access to digital queues and real-time information on about where they are in the line and how long they will have to wait in the que. The study looks at the benefits of VQMS, like how it can make customers satisfied by making the lines seems shorter and improving the entire waiting room experience. The abstract is also talks about how easy it is to use VQMS and how it could help better handle customer time and reduce the feeling of waiting time.

Findings

The study shows that putting the VQMS into service facilities has a lot of positive effects. By using this technology based system facilities can cut wait times and line crowding by a large amount which can makes customers happier. The study shows that VQMS lets customers access queues online, get real-time information, and better manage their time, which makes it seem like they don't have to wait as long. Also, VQMS makes waiting areas look better and improves the entire customer experience, which
leads to more satisfied customers.

Recommendations

To fully utilize the potential of VQMS, service facilities are recommended to adopt the system and train their personnel in its operation. This ensures a smooth and efficient implementation process. Furthermore, the research suggests that facilities should utilize
the data collected by VQMS to make informed decisions regarding resource allocation and scheduling, enabling them to optimize operational efficiency. Regular monitoring and updating of the system are also advised to maintain its effectiveness in addressing queue management challenges.

Conclusion

In conclusion, the Virtual Queue Management System (VQMS) is an important system that can help a lot with queue management problems at service facilities. VQMS uses mobile and web platforms to let users access digital queues from anywhere, cutting down on wait times and line congestion. The system can makes customers more contented in que and makes it easier to manage the resources, and boosts the total productivity of the facility. To get the most out of VQMS, service centers should use it and train their staff on how to use the data it collects, and make sure it is constantly monitored and updated. Implementing VQMS could change the way people wait in lines and improve service delivery in many businesses.

Review of Related System/Software Products

A web based waiting system

In every establishment that has a queuing it's important to have good line management to keep customers satisfied. This software is an innovative cloud-based software that changes the way lines are managed by cutting wait times and making the whole customer trip better. Qwaiting is software for managing lines that is stored in the cloud. While Queue Systems are meant to shorten the time people have to wait. Their
Queuing solutions are not only to save time and money, but they also increase profits, make the environment safer, and make the experience for visitors better. The software has a good features they are using a cloud based technology which allow their customer to be able to access in web booking and specially in virtual Ques and self-check in kiosk. One of their famous line is “If your customer service is good, your buyers will be happy to wait”. The software will let all user to check in for service over the phone and wait until it's their turn to be served. The staff will get all the information they need to give each customer the best service possible. Know everything as it happens.

SEDCO

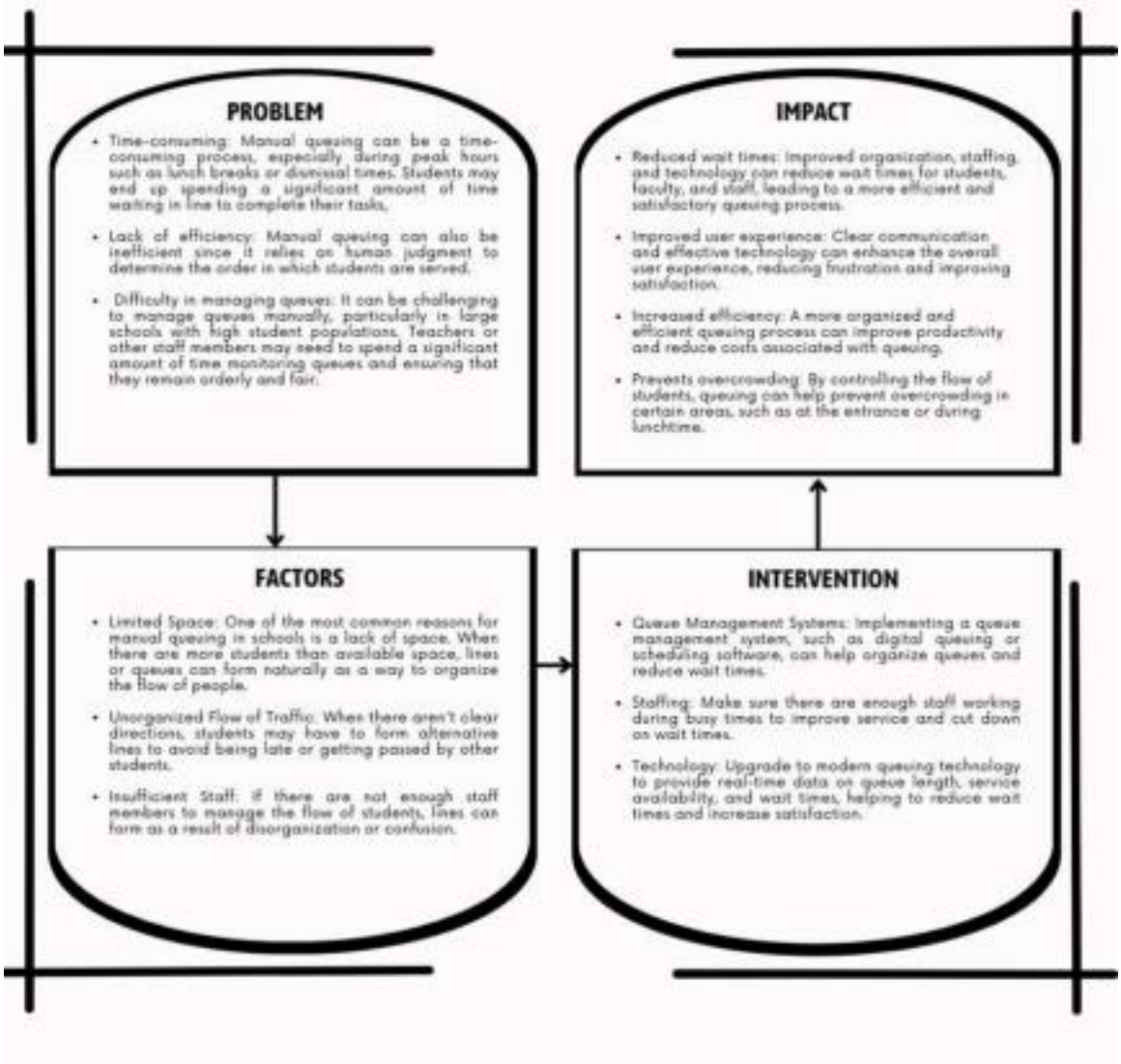
SEDCO is a well-known company that focuses on improving the flow of clients. Their system offers a wide range of products that can improve efficiency of queuing in areas like healthcare, finance, retail, and public services. Their services include virtual queueing systems that let customers join lines through different routes and self-service booths that cut down on wait times and give customers services that fit their needs. Digital displays keep people

interested by showing real-time information about the line, and mobile apps provide updates and messages about where people are in the line. SEDCO's solutions for managing lines can be used by any company or study that wants to improve customer service, reduce wait times, and increase overall satisfaction its also has a features that allow user to access Mobile Queuing, Online appointments and Ticketing Kiosk . Putting these systems together can improve how users feel and make things run more smoothly in many different areas.

Research Paradigm/Conceptual Framework

Having student wait in a long line at schools can be tiring and inefficient, leading to long wait times and frustration among both students and teachers. Numerous factors, such as long ques, insufficient personnel, outdated technology, and unclear communication, may worsen this issue. Utilizing a Queue Management System are one of the solution to these issues. This could mean that using digital screens and mobile apps to help the student to join and track their que can speed up the process of getting in line. In addition to clear signs and designated waiting areas, it might also need the right number of staff during busy times.

When a QMS is put in place, it can lead to important results. It can lead to shorter wait times, a better experience for participants, more efficiency, better security, and a better process for the organization. Overall, using a QMS can help fix the problems with the way schools handle lines, leading to a more organized, orderly, and pleasant environment for students, teachers, and staff.



Description of Methods or Approach
Methodology/Architecture/Fundamental Algorithm/Mathematical Models or formula

Methods Used in Developing the Software

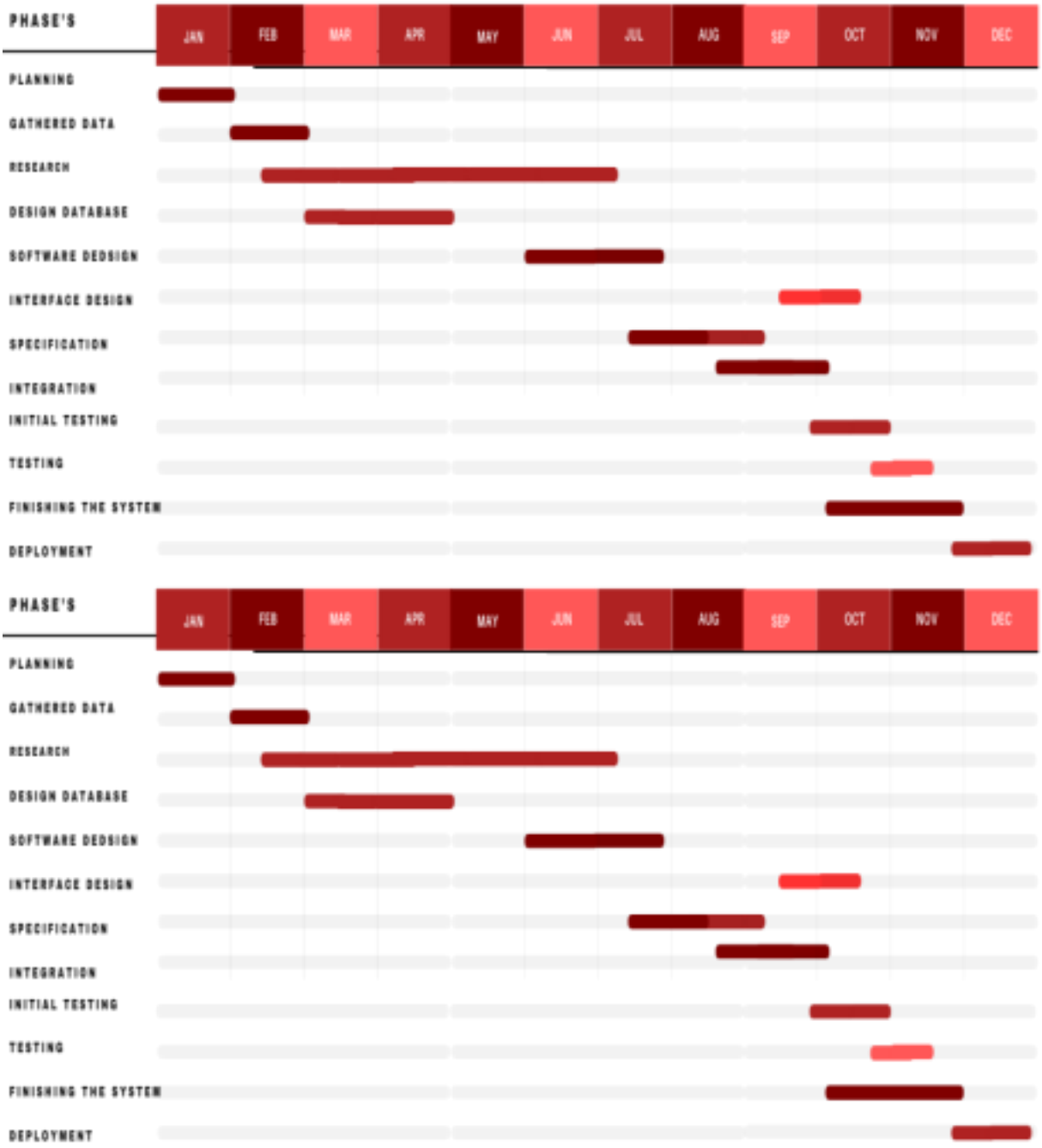
The Agile software development method will be used to make the Queuing Tracking Management System for Manuel S. Enverga University Foundation Candelaria Inc. This method is well-known for its adaptability, incremental progress, strong collaboration, and constant growth. The Scrum framework, which is a part of Agile, was chosen to handle the development process. This made sure that the system met the different needs of different schools and could change as their needs did. The User needs and experience were an important part of the development process because they helped the team stay focused on the needs of the end users. Rapid prototyping was used to make and test the user interface and user experience. This made it possible for schools to give constant feedback and made sure that the finished product was easy to use and intuitive. Testing while developing was an important part of making the software, which made it better and more

reliable overall. By writing tests before the real code, the development pair made sure that the QTMS had all the features and requirements they wanted while reducing the number of bugs that could happen.

A Continuous Integration and Deployment workflow was set up to make it easier to add new features and make changes. This method made it possible for changes to be sent out quickly and kept the system **stable** and running well. In short, the Agile method will be use in order to make a queue management system that is easy to use, efficient, and effective, and that fits the needs of educational institutions. This all-around approach will led to the development of a software solution that can speed up and manage student lines for services like registration, tuition payment, inquiring and other different transactions.

CS Thesis Workplan

These thesis workplan, presented here, outlines the systematic approach and timeline for conducting the research project and developing the system software.



Ethics Consideration

The researcher's main goal will be to answer questions about ethics. Before the study can begin, volunteers at the research site and Manuel S. Enverga University Foundation Candelaria Inc. must give their permission. Also the researcher will ensure the confidentiality and it will be made to protect the rights of those who are involved. Respondents who voluntarily take part in the study will be treated with the greatest of respect, and they have the right to stop at any time. As the researcher take care of the information, they will make sure it stays private. And won't show the results of the first round of information gathering in a way that is unfair or not true. They also guarantee to be open about how we do our study and to take the steps needed to avoid possible conflicts

of interest. Everyone will be kept informed of the status of the investigation, and the researcher will always work to stay true to the ethical standards that guide of the study.

Conclusion

The goals of the project have been met by the research and development work that went into making the Queueing System for Manuel S. Enverga University Candelaria Incorporated. Utilizing modern technology to improve and streamline the queueing process in the schools, this method is an important achievement.

1. The implementation of a Queue Tracking Management System at MSEUFCI will greatly enhance the overall user experience by providing real-time information on wait times, service availability, and allowing users to track their queue status remotely. 2. The proposed system will optimize the queuing process, reducing waiting times and increasing productivity. This will lead to a more efficient and streamlined operation within Manuel S. Enverga University Foundation Candelaria, Incorporated. 3. The Queueing System will generate reports on queue management that will help in enabling the admin to make an informed decisions based on real-time data. This data driven approach contributes to better planning and resource allocation.

4. The system's interface is designed to be simple and user friendly for both staff and students, ensuring the simplicity of use and a positive interaction with the system. Because of this, the experience is more focused on all of the user satisfaction.

Recommendations

After looking closely at the results and discoveries of the proposed system, the researcher suggests the following areas for future study that other researchers may want to look into:

1. Researchers in the future can look into adding additional features, like messages notification. in this users can be notified by this system when it's almost their turn, what the state of their queue is, and how long they predict they will have to wait. While people are waiting in line, this will keep them aware and interested, which will make the process easier and less frustrating.

2. Future researchers may consider implementing a feedback mechanism within the queueing system. This could allow students to provide feedback on their queueing experience, which can help identify areas for improvement. Additionally, the system could collect data on student satisfaction and wait times to continually optimize the queueing process.

References

[1] Qwaiting, “Qwaiting - Queue Management System to Manage Customer Flow,” Qwaiting. Available at: https://qwaiting.com/?gclid=CjwKCAjw3POhBhBQEiwAqTCuBvcpbwoHHWPJOxcE_r0Fi88y4xpqp6bollSXRt8LoIU8KOwTHNJeDxoCG6cQAvD_BwE [Online]. Accessed: Apr. 18, 2023].

[2] V. Kartashevskiy, N. Kireeva, M. Buranova, and L. Chupakhina, “Study of queuing system G/G/1 with an arbitrary distribution of time parameter system,” [Online]. Available https://ieeexplore.ieee.org/document/7357297 [Accessed Apr. 19, 2023].

[3] D. M. Salameh, “Expert Queuing System using Statistical Analysis and Fuzzy Logic Technique,” Innovative Systems Design and Engineering, Jan. 2015, Accessed: Apr. 20, 2023. [Online]. Available at: https://www.academia.edu/99709158/Expert_Queuing_System_using_Statistical_Analysis_and_Fuzzy_Logic_Technique [Accessed: Apr. 20, 2023].

[4] "What is Queue Management System?," Qminder Blog. [Online]. Available: https://www.qminder.com/blog/queue-management/what-is-queue-management system/. [Accessed: Apr. 20, 2023].

[5] Bidari, A. (2021) Effect of queue management system on patient satisfaction in emergency department a randomized controlled trial, Available at: https://www.researchgate.net/publication/354950637_Effect_of_Queue_Management_System_on_Patient_Satisfaction_in_Emergency_Department_a_Randomized_Controlled _Trial. [Accessed: Apr. 20, 2023].

[6] “Effect of Queue Management system “[Online] available at https://www.researchgate.net/publication/354950637_Effect of_Queue_Management_System_on_Patient_Satisfaction_in_Emergency_Department_a_Randomized_Controlled _Trial. [Accessed: April 20, 2023].

[7] “Queue Management,” *SEDCO*. [Online] Available at https://www.sedco.co/en/products/queue-management [Accessed Apr. 20, 2023].

[8] H. C. Ndukwe, “Reducing queues in a Nigerian hospital pharmacy,” *African Journal of …*, Jan. 2011 [Online]. Available:https://www.academia.edu/1641647/Reducing_queues_in_a_Nigerian_hospit al_pharmacy management [Accessed Apr. 21, 2023].

[9] N. Titarmare and A. Yerlekar, “A Survey on Patient Queue Management System,” *International Journal of Advanced Engineering, Management and Science*, vol. 4, no. 4, p. 229, 2018, [Online]. Available: https://www.academia.edu/36597498/A_Survey_on_Patient_Queue_Management_System. [Accessed: Apr. 21, 2023.]

[10] M. Ngugi and J. Mwai, “VIRTUAL QUEUE MANAGEMENT SYSTEM.” Available: https://www.ijssit.com/main/wp-content/uploads/2018/08/Virtual-Queue-Management System.pdf. [Accessed Apr. 21, 2023].

[11] Y. Ojirobe, A. Yahaya, and M. Abdulkarim, “AN ANALYSES ON PATIENTS’ QUEUING SYSTEM AT MUHAMMAD ABDULLAHI WASE SPECIALIST HOSPITAL, KANO,” *FUDMA JOURNAL OF SCIENCES*, vol. 5, no. 2, p. 344, 2021 [Online]. Available: https://www.academia.edu/101511831/An_Analyses_on_Patients_Queuing_System_at_Muhammad_Abdullahi_Wase_Specialist_Hospital_Kano [Accessed: April 21, 2023].

