Online Ordering system

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System Application Overview

Introduction

Computers have become the order of the business when it comes to accessing information in the 21st century. It is evident that this 21st era is controlled by technological advancements making it very difficult for any organization to thrive without embracing technology. The World Wide Web can be seen as the main contributing factor when it comes to the creation of the continuous access to the global databases. Technology has also provided a mechanism through which enterprises can share information internally or externally.

Nowadays most of the fast food restaurants and those offering take away food services are keen when it comes to ensuring faster preparation and quick delivery of orders in addition to giving rich partaking experience to the customers (Chuck, 2007). In the recent past most of the delivery orders were made via phone calls but then this method posted many challenges due to it inconvenienced many customers who needed to have the physical copy of the menu, it lacked the visual confirmation that the placement of the order was correct and also it forced the restaurants to have their employees answering phone calls and recording orders by the customers.

I am proposing an online ordering system that will provide a mechanism for ordering food online and it can be used in any supply industry. The system can also be used in most of the cafeterias in the colleges or hospitals (O’brien & Marakas, 2011*)*. The main merit of this system is that it will help simplify the ordering process for both the restaurant and the customers. It will have an ordering webpage that when a customer visits, the customer will view an interactive and an updated menu that displays complete options of food and the prices dynamically adjusts according to the selected food option (Chuck, 2007). After a customer makes an order, the item selected will be added to the order list of the customer where the customer can view the list several times before logging out. With this there is an instant visual verification of what a customer has selected and this ensures that the items in the order list are exactly the items the customers needed.

The online ordering system also lightens the kind of loads the restaurants have to deal with since the entire ordering process is automated. As the orders are placed on the webpage, they are also entered into the database where they can be retrieved at any time. Within the online ordering system, all the items in the order are also displayable together with their various options and the delivery specifications and this is very concise and presented in an easy to read format (O’brien & Marakas, 2011*)*. With this kind of system, the employees in the restaurants can quickly go through the orders as they are made giving them time to produce the required items with less delay and confusion.

**Statement of the problem**

There are several challenges that the present systems most so the manual paperwork that will post a big challenge that can hinder the realization of efficiency and satisfaction of customers in the restaurants. The kind of ordering that the customers are facing does not please them as they are forced to stand in long lines that are so annoying and this is experienced mostly during peak hours. Even after standing in line for long periods and have placed their orders, customers are still forced to wait for their orders to be made. In the food industry the restaurants fail to realize efficiencies that can be due to the application of new technology in their day to day running of the businesses (O’brien & Marakas, 2011*)*. The problem with the current systems is that the customers are not in a good position to see the kind of ingredients that were used to prepare the food they are in need of or will be ordering. And some of the systems only allow the customers to pay for the orders online before they even confirm their orders. So this proposed system will benefit both the restaurants and the customers.  
**Requirement Specification**

**Objectives and Goals of the system**

**General objectives/goals**

1. To ensure increased efficiency and improved customer services through better use of technology in the day to day running of the food delivery industries.
2. To ensure competitive advantage in the food service sector.

**Specific objectives/goals**

1. To allow customers to place orders on custom meals missing in the menu.
2. To enable customers know the ingredients before ordering food.
3. To enable customers to visually confirm that they placed correct orders
4. To help reduce food wastage in the restaurants
5. To help ensure efficiency of the restaurant staffs
6. To increase service speed, sales bundles and satisfaction of the customers.

**System justification**

1. To ensure increased efficiency by reducing time taken in purchasing and do away with paper work by insisting on online transactions
2. To lower food wastage in the restaurant while maintaining efficiency of the staffs in the restaurant as the staffs will know the type of food the customers want in advance
3. To help achieve competitive advantage by ensuring that the daily operations in the restaurants are automated thus ensuring increase in the volume of sales
4. To achieve increase in customer satisfaction, this system will help speed up the food delivery process.
5. To ensure reduction in time wastage, this system will help do away with long queues.

**Assumptions of the proposed system**

The online ordering system will simplify and improve the efficiency of the ordering process for the restaurant users and the customers, it will be top ensure reduced paper work in the restaurants and assure data accuracy and security when placing orders. The customers will be in a good position of viewing the product menus together with their ingredients and visually confirm the orders before placing the orders.

**Limitations of the proposed system**

* It requires internet connection and the users must also be computer literate.
* The targeted customers must be adults who can access computer systems meaning the young people will be forced to physically go to the restaurant to buy the food items or they will have to order with the help of an adult.
* The system will only be convenient to people in a small geographical location possibly around the restaurant meaning the system can be able to serve a limited area.

**Feasibility study**

This provides an evaluation and analysis of potential deliverables of the proposed system based on serious investigation and research aims at backing up the process of decision making. It assesses the technical, economical and technical advantages of the system (Justice, & Kreigsmann, 1979). The study will be used to recommend the development of the system.

1. Technical feasibility; this is mainly focused on getting understanding of the technical resources that are currently used in the organization and how they can be applied in the restaurants. It tends to evaluate the hardware and the software and how they can meet the needs of the proposed system. The system project will be considered technically feasible if its technical internal capability can support the requirements of the system.
2. Operational Feasibility; this measures how the system will be able to support the customers and those providing the services in the operation phase. It mainly depends on the available human resources for the development of the project. It also involves predicting if the system will perform as expected when it is developed.
3. Economic Feasibility; this assesses the positive benefits that the system should provide if implemented on the organization (Justice, & Kreigsmann, 1979). It mainly involves costs and benefit analysis and it helps evaluate the effectiveness of the system to be developed.

**System Model**

The structure of the online ordering system can be separated into three major logical mechanisms. The first component is required to give some kind of menu management that can allow the restaurant to exercise some control on what the customers can order. The web ordering system is the second one and it provides the functionality that allows the customers to make orders as they specify the required specifications. The final logical component i.e. the order retrieval system that can be used by the restaurant to maintain the track of the orders that the customers have placed , in that it ensures retrieval and displaying of order information as well as allowing updating of the orders processed.



**Functional Requirements**

From the system model above, it is evident that each of the constituents essentially gives a layer of separation between the user and the database. What motivates the separation is dual, for instance, it allow the end user to interact freely with the ordering system via a rich interface and this ensures that the users enjoys using the system, most so for the non-technical visitors of such sites as they will account for most of the users of the system. The isolation layer also provide a protective mechanisms that ensure integrity of the database as it will prevent the users from trying any action that the system is not meant to deal with. Due to this pattern of design, it is vital to compute the kind of functions that will be offered to the users. The functions are grouped in components and are analyzed below.

1. **A web ordering system**

The users of the web ordering scheme i.e. the customers of the restaurant need the following functionality:

* Create a user account.
* Manage individual account.
* Log in to the system.
* Navigate freely on the restaurant’s menu.
* Select items from the restaurant’s menu.
* Ability to customize the options for any selected item.
* Ability to add other items in their current order.
* Possibility of reviewing the current order.
* Ability to remove an item or all the items from the current order.
* Providing a delivery and payment particulars.
* Confirm and place an order.
* Receive a confirmation via an order number.

Since the main aim of this system is to ensure that the order placing process is very simple for the customers, the functionality that is provided via the web ordering system should always be restricted to that which can help accomplish the intended tasks. All the functions listed above, apart from creation of account and management of the account will always be used provided a customer places an order.

1. **Menu management System**

Menu management system will only be available to the employees of the restaurant and it will allow them to manage the menu that the users can access in the online ordering system. With the help of a graphical user interface, the menu management system provides the following affordances to the users i.e. the employees of the restaurant:

* Add a new vendor, update the menu, and do away with a vendor to and from the menu.
* Add a new food category to the menu or delete a food category from the menu.
* Add a new option, update or delete a given food option from the menu.
* Add a new food item, update the current food item to the menu or delete a food item from the menu.
* Update the evasion options for any given food.
* Update charge for any given food item
* Update additional features for any food.

The functionality that this component provides will be the things that the restaurant user will be able to note since they will be required to peruse through the menu before they can resolve to make orders. After configuring everything in the beginning, this component will not be used most of the time since the updates for the menu do not take place frequently.

**Order Retrieval system**

Of all the three components, this system has the simplest functionalities. Just like the menu management system, order retrieval system is devised to be used by the employees of the restaurant only and it provides the following uses;

* Retrieval of new orders from the restaurant’s database.
* Helps display the orders in a form that is easy to read and in a graphical way.
* It helps mark an order as processed and takes it out of the list of still active orders.

**Interface Specifications for the user**

Each of the components of the system will present unique interfaces as described below;

1. **Web ordering System;** the users here will be able to interact with the system via a sequence of simple forms. Every food category will have its form that give a drop down menu that allows the choosing of any specific item from the category that should also be added to the order, it will also have checkboxes and radio buttons that allows a user to select the options they want to include. The process of adding an item to the order will just be accomplished by a single click of the button. The users select the category of food items they want to order and this dictates the form that is displayed to them, and they navigate through the menu bar and this approach will made familiar to the users. The process of requesting for delivery i.e. providing the delivery and even payments particulars will also accomplished in the same way. The user will be served with a form which he must fill and the form contains the drop down and some text boxes that the user must attend to before making an order and receive a confirmation number of the order they place. The drop down and the text boxes help simplify the ordering process and ensure security of the data in the database.
2. **The Menu Management System;** users interact with this system the same way in the web ordering system. The users are supposed to navigate to find vendor, category or even the specific food item the vendor wishes to modify and after they make a selection, they are served with a form that contain all the fields with details of the item they selected which they are free to modify or remove at their own will. The form also allows addition of other fields and some values. However, unlike the web ordering system, most inputs in the menu management system are freeform as there is no specified number of fields and values that can be added. Since most of the inputs will be done, by restaurant employee, the input sanitation will be ensured as the user here is not expected to be malicious when using the system.
3. **Order Retrieval System;** the user-interaction here will be very easy as this application will automatically fetch new orders from database in regular intervals and ensure it displays the order numbers, delivery time on the left hand side of this application. To view the details of any order, the users will just click the order number which will give the details of the order on the right hand side in an easy to read form. The structure will be constantly expanded or collapsed to ensure it displays only the desired data. Once any order is processed, the user will just click a button labeled processed in order to remove the item from the list containing active orders (O’brien & Marakas, 2011*)*.

**Non-functional Requirements**

Since the design pattern of this online Ordering System is more like the standard for any web application, the non-functional requirements of this system seem to be very straightforward. The application will be compiled to HTML and JavaScript and backend using PHP. I would also recommend free XAMPP distribution for the system. A PostgreSQL server will have to be installed on the host system as the data of this application are stored in a PostgreSQL database.

The server hard drive will be any computer that can run both the web servers and the database server and be able to handle any traffic in the system. For the restaurant that does not expect the web traffic, a personal computer may be recommended.

A non-functional condition specifies some of the conditions to be applied when assessing the operations of the system, than just displaying the specific operations of the system. The non-functionality necessities include;

* There should be enough network bandwidth
* There should be back-up system to ensure data backup
* Maintainability of the system i.e. the system should be easy to maintain
* The system should response faster
* Usability by the target users
* The system should be easy to expand and upgrade
* It should be safety to use.

**System or Application Design**

**Software requirements**

* Operating system should be windows 7
* Technology ;PHP
* Database ;MySQL
* Tool ;Dreamweaver
* Antivirus software for security purposes
* Backup plus data recovery software

**Hardware requirements**

* Processor; Intel dual core and above
* Speed of the processor; 1GHZ and above
* RAM; 1GB and above
* Printer for producing the reports
* Power supply should constant
* External storage device like a 2GB flash drive and above

**ANALYSIS AND DESIGN OF THE APPLICATION**

To develop any computerized system, there is need to analyze the process that will be digitized critically so that a correct system results. And a system that operates as per the user specifications and helps the users to understand the functionalities of the system fully. The analysis part of developing a system specifies the objectives of the system and the kinds of restrictions the developers must adhere to. Analysis helps transform the major inputs of any system into the structured specifications.

**Context diagram**

The context diagram is a brief structure depicting the kind of environment where a software system can be found and it also assists in communicating anything that lies outside the boundary of the system.

MANAGER

MEAL DELIVERER

CUSTOMER

ADMIN

View Request Delivery

Create user/Edit/Delete Confirm Delivery

New customer Create food category/Delete/Edit

Place order

Order confirmation view

View products

**Data flow diagram**

Data flow diagram is a two-dimensional diagram explaining data processing and transfer of data in the system. It has a graphical depiction that identifies each and every source of data and how such data interacts with other data sources in order to accomplish a certain goal.

The administrator module has the following functionalities;

* Creating usernames and passwords
* Viewing/deleting/editing user accounts

Access/delete/edit/add

ADMIN

Create username and password

Login

Login db

View

Accept/deny Request

Save

Retrieve

Retrieve Validate

The customer module provides the following functionalities;

* Viewing product lists
* Register
* Placing orders

Retrieve

Get product list & details

Product db

Login

CUSTOMER

Order Placement

Login db

Registration

Order db

Request

Request View

Request Place order

Accept/deny Receipt

Retrieve Validate

Request Feedback Submit Confirmation

Save

Confirmation

The manager module provides the following functionalities;

* Creating product categories together with functionalities
* Editing/deleting product categories and particulars
* Viewing and managing orders and sales reports

Accept/deny Request/Edit/Delete

Login

MANAGER

Create product categories & descriptions

Login db

Manage orders i.e. view sales report, change status of products

Product db

Order db

Request View

Retrieve Validate Access/update View Store Retrieve

Save Retrieve

The meal deliverer module gives the following functionalities;

* Viewing pending orders and delivery data
* Confirming order deliveries

Request

MEAL DELIVERER

Get pending orders and customer particulars

Login

Delivery confirmation

Login db

Order db

**View**

Request Accept/deny Modify/edit View

Retrieve Validate Save Retrieve

**Testing and Quality assurance**

**Testing in system development life cycle**

After all the design changes are depleted, it is advisable to test the resulting system but then the test must just be planned for early enough to ensure that the system is ready for the market and the intended users. Final tests that can be done are usability testing, verification/ requirements testing with acceptance testing being the last test.

Software testing entails executing the developed system with the main aim being error detection. It involves actions executed in order to evaluate the capabilities of a system to check whether it meets the intended specifications. Testing proves to be an integral part of system development that is done at almost every part of the process of system development. It is done for several reasons like:

1. **Quality improvement**

Since computers and software constitute the most important applications, the results of the errors can be very dangerous. Testing can ensure that the system conform to the specifications of the system.

1. **Validation and verification**

Validation ensures that the system built is the correct one and it works according to the requirements and specifications of the users while verification on the other hand ensures that the system was built correctly in that the system was designed and built as per the blue prints.

1. **Reliability estimation**

Reliability of any system is related to aspects like structure and the amount of tests of passed through.

Development testing entails all the testing practices that the developers perform. They include;

* Unit testing whereby the developers tests the smallest units of the system they are developing with the aid of the associated data for control, use procedures, and operating methods with the aim of finding their fit for purpose when the system is executed in an organization.
* Component testing also called program testing; this entails testing numerous integrated units during system development to detect some errors in the program and ascertain that the system performs as expected. Component testing is possible in isolation in that it can be effected without having to include the whole system and this purely depend on the kind of model chosen for the application.
* System testing involves testing all the components of a system when they are integrated together. It just means testing the whole system after its development is complete and it aims at evaluating the compliance of the system with the specified requirements. It falls under the black box testing thus it does not need the knowledge of the inner design of logic.
* Acceptance testing; a test that is done in order to determine if all the requirements of any specifications are actually met and that the system can meet all the specifications of the user. It is what determines whether the users will accept or deny the system.

**System quality assurance**

Quality Assurance is a means of curbing defects in the final systems so that problems do not arise when the system has been executed. It entails developing the whole software by adhering to some strict rules that will ensure that errors do not arise thus it is important in ensuring that the system is bug free. Quality Assurance also helps increase confidence of the customers and credibility of the company thus ensuring profitability and competitive advantage.

Some of the software quality assurance methods that I will embrace in an attempt to ensure quality in my application are:

1. Functionality; this help identify all the functional requirements of the system. These requirements are the main features of the products and it helps explain what the system should accomplish and how it achieves it.
2. Usability; it includes capturing, looking and stating the requirements taking into consideration interface issues of the user. For instance, accessibility, consistency and interface aesthetic existing within the user interface.
3. Reliability; this includes aspects like availability, recoverability, and accuracy for instance the ability of the system to recover in case of any shut down failure.
4. Performance; involves issues to do with throughput of information, response time of the system that relates to usability, startup time and recovery time.
5. Supportability; this describes all the requirements that help support the system to be developed. It entails things like adaptability, testability, compatibility, maintainability, configurability, compatibility, instability, scalability, localizability.

**Test and Quality Assurance Plan**

An Online Ordering system is an application that is expected to simply the process of ordering food in the food supply industries. Customers will be viewing the webpage to see the kind of products that are offered by a given food and at a certain price that it is offered at. Test plan shows all the testing schedule and approach for the whole project that am going to develop. The aim of this document is to describe the plan that will be used to test an online ordering system and it has the following objectives:

1. Identify information of the system and its software components that need to be tested i.e. scope of the test components
2. Description of the recommended test requirements
3. The objects to be tested
4. The methodologies of the test to be carried out
5. Give the assumptions of the test plan among other objectives.

**Unit test plan**

Scope of Test components

This test plan will be used for unit test, system test and user acceptance test for the online ordering system. For the unit testing, the plan will be done to determine the quality of the functions of the system i.e. the specific functions of the system.

System testing will handle different areas that will be checked on the whole system with the aim of tracking and recorded errors to be corrected. While the user acceptance testing aims at finding out the performance of the system according to the users specifications so that the stakeholders can record some issues about the system functionalities.

It is possible to assume that unit testing automatically provides a serious black box testing on the system that did extensively test the source code and all the module interfaces. This test plan will handle all the requirement specifications of users in order to ascertain that the system operates according to what the users expects.

Summary of the components being tested

The test aims at understanding the functionalities of the three components of an online ordering system. The components are; the web ordering system that allows the customers to perform certain functionalities like creating a use account, managing individual accounts, possibility of logging into the account and navigate freely so that they can easily pick different items from the restaurant’s menu, and perform some other transactions with a lot of ease. It will also test the performance of the menu management system with the ability of the restaurants employees to perform transactions that are related to the operations of the menu management system an the online retrieval system whereby the users can easily access and confirm orders visually before they actually make orders.

Quality Goals

The quality goals for this test plan is determine that the system will be reliable and that the users will trust it for the transactions they make, efficiency of the system with the main aim being ensuring that the system helps the users i.e. the customers to save some resources when they order items online and have them delivered to them. Under efficiency also, the employees of the restaurant too should be able to benefit the restaurants by ensuring that they accomplish different transactions with few resources so that the organizations can realize competitive advantage. The test plan also aims at ascertaining that the online ordering system provide accurate services as per the users specifications and that the system is easy to use in terms of the ability of the stakeholders adapting to its operations easily.

Testing Objects

The specific test cases for the online ordering system include the data and database testing mainly based upon ensuring integrity of the online ordering system such that the functionalities of the system can be confirmed and that the quality goals can be realized with a lot of ease. The tests that need to be set include, the ability of the system to perform all the requirements specified and that the system is reliable, accurate, easy to use and efficient.

Assumptions of this test plan

All errors in the system during testing will be logged as serious errors will result to an abnormal shutdown of the application. And this will force the developers to get back to the drawing board on how to make the system as appropriate as possible.

A system error message will be displayed that describes the nature of the error resulting from the operating system. And these errors will be contained in the database meant for retaining errors.

Requirements to Test

The test requirements help identify the target items that should be used for testing. The list below represents the items that will be put under test. This involves giving proper descriptions of what need to be tested and developing clear procedures to be used in carrying out the test. The tests that need to perform for the online ordering system include unit testing, system testing and user accepting testing.

Testing methodologies

The methodologies explain the types of tests and the environments where they are supposed to be performed. The tests here are;

1. Unit test

The main aim here is to determine whether the customers can easily access the webpage of any restaurant and perform transactions with a lot of ease. Will the system accommodate concurrent access to its database since it provides a platform three different users, i.e. the admin, employees and the customers? Will it be possible for updates to be effected in the system without inconveniencing other users who may be located in different places? The test aims at ensuring that the system can allow correct retrieval of any transactions performed by the users.

1. System testing

Describes the functional requirements of the whole system and tests whether they are working according to the specifications of the users. For instance

* Verify ability of the systems to permit user logins after they have created user accounts with a lot ease in the use cases,
* Verify that the customers can actually manage their accounts
* Confirm that the admins can easily maintain different data they have in the systems
* Verify that the customers can make orders and confirm them visually verify them before making their final verdict on purchasing any product
* Verify the view of products offered by the restaurants

The online ordering system is expected to display the products that the restaurant offers to the customers.

The system is expected to interface with menu management system, Order retrieval system and the web ordering system and it will be operating on the restaurant server.

The buyer component of the online ordering system will be available on the personal computers of various user provided they can support windows and above.

1. User Acceptance testing

A user acceptance test entails an official evaluation of the whole system that the user performs before buying the system.

The main approach to be used here will be user interface testing and it is expected to provide the following;

Verification of the ease of the user navigating freely through the system as they see various products they might be interested in.

The test aims at confirming that the system navigation conforms to the Graphical User interface standards.

The system is expected to be easy to use and the users to easily adopt to it i.e. the customers and the employees will find the system easy to use.

The desktop interface for the user will be windows 7 and above with the online ordering system being appropriate for all the users.

All the characteristics of the Online Ordering system will contain some built-in user manual to help users understand how to use the system.

Testing Environment

For the test to be effective, the system will be installed on computers running windows 7 and above of Operating system, backup system for recovery purposes. The hardware requirement for the test includes a computer having an Intel dual core and above of processor, the speed of the processor will be 1GHZ and above with at least 1GB RAM.

Testers

Testers of the Online Ordering system will constitute a team of three experts who ensure that the all the components of the system are working as per the specifications. Their responsibilities will be; execute the actual tests, not down results of the tests, help recover from any error and document any defect in the systems.

SDLC phase

Testing of the system will take place at the testing phase of the software Development Life Cycle.

Error Reporting and tracking

Rational ClearQuest system will be used to report and track each and every error.

Completion Criteria

For all the transactions, they are supposed to run to a completion without any failure. The application, database, and the system as a whole should just get to a known desirable state without any disruptions.

Sign-offs

The implementer of the system that is the administrators at the target restaurant will have the final authority to ascertain that the tests are effective and can be exited.

Detailed project schedule

The test activities depend much on the development iterations. The table below shows the test schedule for the Online Ordering system describing the effort, the start date and the final date for every contents of the test planned.

|  |  |  |  |
| --- | --- | --- | --- |
| Milestone Task | Effort | Start Date | End Date |
| 1. **Unit test**   Test planning  Test Design  Test Development  Test Execution  Test evaluation | TBD |  |  |
| 1. **System test**   Test planning  Test Design  Test Development  Test Execution  Test evaluation |  |  |  |
| 1. **User Acceptance Test**   Test planning  Test Design  Test Development  Test Execution  Test evaluation |  |  |  |

**Quality Assurance Plan**

Quality Assurance Plan outlines the strategies and the ways a project deploys to ensure the project is managed properly, and that it deployed accordingly. It also ensures that deliverables of the system are of acceptable quality and this is why it is done before delivering the system to the final users.

The purpose of an Online ordering System Quality Assurance Plan is to distinctively specify exactly how system quality Assurance will be accomplished before recommending the system to final users. System Quality Assurance officers will ensure that maintenance of the system is done appropriately so that the performance of the system can improve. By this, the quality of the system will be improved thus the products from the system will be appealing to both the employees and the customers who will visit the webpage. The table below shows the main SQA activities that will be performed together with the standardized means of performing the activities.

|  |  |
| --- | --- |
| **ONLINE ORDERING SYSTEM QUALITY ASSURANCE PLAN** | |
| **Quality Assurance** | **Detailed Description for project** |
| 1. Documentation Standards | The document used here will be obtained during the maintenance of the software. The document will describe how the system will be inspected to ensure accuracy, and clear procedure for checking the document. |
| 1. Design Standards | Here the quality assurance task will include;   * Ensure adherence to system design standards in that the correct design are followed and the results from the design are recorded. * The process will be evaluated and audited. |
| 1. Coding and Comments standards | SQA will ensure that the coding of the system presented followed the laid down standards. All the comments in the coding shall conform to the standards so that the quality of the system can be validated. |
| 1. Testing Standards | Three levels of tests shall be conducted i.e. unit testing, system testing and user acceptance test shall be conducted. Unit and system testing shall be conducted informally by the provider of the system while user acceptance test will be done by the provider as well but it will have to be witnessed by the users. Any discrepancy in the formal test will have to be recorded in the nonconformance form so that correction measures can be taken. |
| 1. Requirements Review | During the software requirements phase, SQA will ensure that the quality requirements specifications are adhered to and are complete, can be tested and are expressed in a proper manner and that it can function accordingly. |
| 1. Design Reviews | The design shall be reviewed on each component of the system so that the resulting system will meet the required standards. |
| 1. Code Reviews | The coding at the development stage for the system shall be reviewed to ensure consistency and conformation to the standards. |
| 1. Quality Assurance Measures or Metrics | Formal testing will performed as per the formal test requirements by following the procedures accordingly with the aim of ensuring that the functional, interface and performance requirements of the system are met. |
| 1. Quality Assurance Management (Ownership) | All the components shall be tested as per the plans that the final product that the user get will satisfy them in terms of usage. |
| 1. Problem Reporting and Correcting Actions | Any error in the system will be recorded and reported to the standard adherence team so that they can be corrected and present a changed system to the users. |
| 1. Risk Management | The project developer shall identify all the risks that can cause failure to the system and any risks that will be found will be controlled by software before commencing on implementation of the system. Safety assurance program will be conducted to ensure that all the requirements are adhered to. |
| 1. Record Collection and Retention | During Quality Assurance, all the outcomes of the tests shall be recorded and kept for future reference so that better systems shall be developed. |
| 1. Testing to be performed | Unit testing, system testing and user acceptance testing will be performed. |

**Development Strategies**

1. Physical Architecture
2. Development Strategies
3. Benchmarking
4. Outsourcing vs. in sourcing
5. Support and Maintenance

**Physical architecture**

A hierarchical description of resources that comprise a system

Goal: provides resources for every function in the functional architecture

Required for each stage of the life cycle (just as requirements and functional architecture)

Top layers consist of system level components

Lower layers consist of Configuration items

Hardware, Software, People, Places, Vehicles, Documents

**Generic physical architecture**

A description of the partitioned elements of the physical architecture.

Does not provide and performance characteristics or requirements to the physical resources Instantiated physical architecture

A generic physical architecture with performance characteristics for each resource has been added generally much more descriptive and specific

Overall Goal: assign resources to functionalities

Decompose the physical resources

Map resources to corresponding functionalities

One-to-one and onto desired

Decomposing Physical Resources

1. Brainstorm about generic architecture

2. Instantiate potential resources within generic arch

3. Select a number of feasible instantiated architectures (potential integrations)

Outsourcing- contracting outside suppliers for acquisition of materials or service.

1. The design, development, and production of component
2. Production and distribution of components
3. Providing a service

Goal of outsourcing

Efficiency: in a larger market you have a larger pool to choose from cheaper.

**7 system development life cycle (SDLC) phase**

 Preliminary Analysis or Systems Planning for an Online Ordering System

* 1.1 Define mission, objectives, and purpose for system

When you are creating an online ordering system, the purpose is to create a system that is fast, easy to use and that will allow you to place an order in a quick and easy fashion without giving the system much thought.

Objectives:

1. Create a glitch free easy to use system.
2. Make the system user friendly for all users.
3. Sleek and elegant interface and no complexities of use.

* 1.2 Develop detailed problem statement

Statement: The mission of any website or ordering system is to ensure that the product that the customer wants and orders gets to them without any problems. Also it is important to make sure that there are going to be encryption and protection measures in place to protect the data of the customers who are purchasing through the system.

* 1.3 Describe current state

Currently most of the processing happens old school, most customers are calling and are placing orders over the phone and this is something that takes a lot of time and also requires a lot of labor to pull off.

* 1.4 Identify benefits for new system

With a new online system, you are creating a virtual environment that can operate 24-7-365 and that will make sure that everyone who is working in it is a machine. That means that there will not be problems with people being tired. It is possible to greatly reduce the amount of labor that is going into the production as well as the time that is required to get the job done.

* 1.5 Identify scope, risks, and constraints

Since this is the first online ordering system for the company, the scope is large because this will be a change for the entire company. The only real risk is that the encryption will not be high enough and data will be stolen or that employees may not know how to use it properly. What that means is that it is mission critical to get the buy in of the whole company on the new system. There are really no constraints once it is up it is going to be the new go to model for the company.

* 1.6 Feasibility study

The new system is going to be very feasible. We tested this by creating an online ordering terminal that was available only in a specific area and that meant that customers who were in Chicago were able to use the online ordering interface, they and only they were able to see what the new look and the new feel was like and they were very happy with the results. It is easy to understand why as well considering how much faster and easier it is to have access to the new features and speed.

* 1.7 Analyze formal system request

When there is a formal request that is made in the future by the company, it will be necessary to make sure that the process will be approved by the engineers. New features need to be approved by the engineering team and need to also show that they add real value to the product before they are added to the development slate.

* 1.8 Receive approval to go to next phase

When there is approval that happens from the engineering team that the new features are going to be added in, they will then be tested by a testing team and then worked into a local area to test before being rolled out nationally.

 System Analysis and Requirements Definition

* 2.1 Requirements gathering

The first thing that will happen to make sure that it is possible to have access to all of the requirements will be to talk to the management and to determine what it is that they are looking for. After understanding what is necessary, it will be important to design a solution that has all of these features and that is robust as well as easy to use for all who are involved.

* 2.2 Conduct interviews

Conducting interviews with management is the best way to make sure that you understand all of the details that they are looking for. There may be additional industry specific pieces of equipment and new details that need to be considered from a standalone general online ordering system.

* 2.3 Surveys

Surveys are also important to look at the current procedure and to determine what the issues are that are being had right now and to find new ways to deal with all of those issues as quickly and easily as possible.

* 2.4 Document observations

It is also important to spend time with the current team who is handling ordering and see the way that they are interfacing with the customers and determine how other measures might be taken in the future to see how everything interfaces and how they are currently dealing with issues.

* 2.5 Sampling

It is important to do sampling of the way that customers are feeling about the current system. Sometimes one of the things that they really like is having the ability to pick up the phone and speak to a person and for that reason it is very important to make sure that the human element is not being forgotten. There still needs to be a way for a person to press a button and get to a human.

* 2.6 Review of artifacts

The artifacts of the process need to be reviewed, there needs to be a very thorough understanding of what the process is currently as well as what else is out there currently for many of the other competitors to determine what they want to do in the future.

* 2.7 Build business, data, process, and object models

Part of the most important part of this process is looking at the ways that things communicate and making sure that it is possible to have access to the best options as well as the best data models. Since the old system was the phone it is not possible to look at the old way and the new way, instead it is important to look at the other software interfaces out there and the structure and see the way that they are working to create the best possible interface.

* 2.8 Conduct requirements reviews

The next step in the process is to make sure that we are looking at all of the requirements that are outlined in the process and then analyzing all of the components into a great strategy that will ensure that all of the requirements are met for business.

* 2.9 Generate system requirements specification document

The document needs to explain what all of the steps of the process are because when it comes to creating an online ordering system that means that it has to work with the existing CRM as well as interface with the email system and all of the other responses that are necessary to make sure that people are able to communicate with customers and that they are able to also have access to an email automation program and a survey interface rather than just the online processing piece.

 System Design

* 3.1 Develop physical model

When it comes to the physical model, system is going to be composed of three cloud servers that will exist on the Amazon environment. The servers will be divided into search server, interface server, and database. The database will be SQL Server 2012 to ensure that all of the customer’s information is protected.

* 3.2 Design user interface

The user interface is going to be built on Ruby on Rails since it is one of the most flexible and nimble current interface solutions. The system is so nimble that it is possible to use it for anything and to apply any necessary branding to the look and feel of the interface all with the same code.

* 3.3 Identify inputs, outputs, and processes

The input into the system will be the customer’s information, personal and payment as well as all of their preferences. The outputs of the system will include emails and savings for customers as well as all kinds of orders for them and tracking information. The system will also have analytical and customizable crystal reports that will be available for drilling down to any level of detail. The processes will include the ability to subscribe to a newsletter, special emails, and also the processing of the orders as well as information that will be sent out that will inform customers. The system will work with the current salesforce application that is being used by the company.

* 3.4 Design internal and external controls

The internal controls will be that there will be a very strict level of encryption and firewalls to protect the data of customers as well as there will be external controls.

* 3.5 Design features and functions

The features and functions are outlined above.

* 3.6 Determine application architecture

The application architecture is going to be Ruby on Rails, SQL, and also a Salesforce plug in.

* 3.7 Conduct design reviews

We will meet with the engineering team and will look at these designs and see how it is possible for them to work together. We will also look at any issues that might exist with the parts of the systems that are working. In addition, it is also important to make sure that the systems are able to work and do not have problems. We will also look at what has worked for other systems and what has not worked as well.

* 3.8 Develop final system design specification

The final design will be approved and then the structure will be passed to the engineering team to begin with the coding.

 Development

* 4.1 Develop or code all components based on design

Based on the design it will be important to design a project plan to make sure that all of the components are able to be created in order of importance.

* 4.2 Prototype components

After the components are going to be creating it is important to do regression testing to make sure that everything works together.

* 4.3 Conduct usability tests

With usability tests it is very important to make sure that the system is easy to use as well as that it will work without any kind of error message.

* 4.4 Design test for all other types of testing

Testing needs to be done by the engineering and the consulting team to make sure that everything is working. A program like Bugzilla needs as well to be used to track all of the issues to ensure that there is a workable solution as well for all of the problems that are found.

* 4.5 Unit test and fix errors

When you do a test you will want to make sure that you test the process from end to end so that there is no issue with the process.

 Integration and Testing

* 5.1 Determine conversion activities

When all of the testing has been completed it will be important to test the new system in the local area of Chicago so that it is possible to make sure that there is going to be a go live that happens a phase at a time.

* 5.2 Determine training activities

When it comes to training, it is going to be important to make sure that there is training that is going to happen a bit at a time and that the roll out will happen in one city at a time to ensure that there are no issues with the process. In addition, it is going to be important to ensure that there are trainers who are ready to train all of the customer service representative’s one step at a time in the process.

* 5.3 Conduct testing activities

After there is going to be training it is important that the trainers also do regression testing to make sure that everything is working well.

* 5.4 Fix any errors that occur during the test

If there are any kinds of issues that happen with the system, they need to be reported in an organized fashion by using a ticketing system so that they are able to submit the information to the engineering system.

* 5.5 Determine transition plan

The transition plan needs to be easy as well as smooth as possible and that means that the plan needs to include training as well as allow for there to be a city by city roll out in the USA before going to the international market.

* 5.6 Develop a back-out and recovery plan

In the event that there are issues, the staff needs to be ready to go back to the existing phone system until the errors in the new system are revised.

 Acceptance, Installation, and Deployment

* 6.1 Install any required software and hardware for production environment

It is important to install all hardware and all software to make sure that everything is ready for go live.

* 6.2 Validate that system is functioning correctly

After the install it is time to do regression testing and other testing to make sure that it is possible to have access to all of the best options and see that there are no issues.

* 6.3 Conduct stress or volume tests

What they need to do is to see as the system rolls out that there is no problem with the volume as well as with the process.

* 6.4 Perform conversions and transitions

If there are any issues that are there with the conversions and with the process it is very important to get the load moved and balanced right away.

* 6.5 Receive approval for going live

When there is approval for go live it will mean that there is a time as well as a plan.

* 6.6 Go live or perform back-out and recovery

With go live it is important to see how everything went and to see if it is necessary to back out.

* 6.7 Close out any contracts and end project

After this project it is very important to close out all of the open contracts with the client and to make sure that you have access to the end of the project.

* 6.7 Conduct a post mortem or lessons learned

After the go live it is important to sit down and to look at what went right and what went wrong so that it is possible to have a good idea of what to expect.

 Operation Support and Maintenance

* 7.1 Train all support personnel

After the go live it will be important to train the entire staff and make sure that everyone has a good idea of how to work the system in all areas.

* 7.2 Establish all information technology (IT) security infrastructure

Make sure that the process is completely outlined and that there is no confusion about the maintenance and the process of controlling the environment.

* 7.3 Transition to operations and maintenance mode

You want to make sure that you are working with the production team that will own the system after the go live. That means that it will be possible for them to be on top of everything that is going to help them.

* 7.4 Ensure that the system is meeting service level agreement (SLA) goals

Make sure that the system handles everything that the client is asking for and you will have a client that is happy for a very long time.

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