

Research Project
Testing A Restaurant Automation System

1. Research Project Description

Consider the following Software Requirements Specifications (SRS) document for a new restaurant automation system. It clarifies all customer's needs for the new developed system. You work in the QA department of an international company and you are assigned to test this system.

1. Develop your Test Document by applying the systematic test methodology you studied to identify the independent testable features of this system.
2. Derive the supportive models that can help you model the system specifications if needed.
3. Identify the test case specifications of each independent testable feature, where all clues, preconditions and postconditions should be clarified and included.
4. Determine the test cases required to validate this system by applying the appropriate testing technique(s) you find optimum, based on the test case specifications you identified to ensure efficient functionality. *Hint: A test case should include its 3 main parts.*
5. Determine the different system testing techniques you find essential for the nature of this system and identify the associated test cases required to apply them to the system.
6. Suggest the optimum security architecture of this system and recommend the main security testing techniques that should be considered to secure this system.

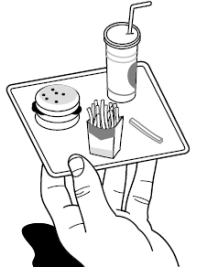
2. Research Project Instructions

The form of the research test document should follow the following regulations:

- Write using Microsoft Word.
- Use Times New Roman, Arial, or Calibri font.
- 12 Font size for text and 14 Bold for the titles.
- Single space between the lines.
- Page margins are 2.5 cm from top, bottom, right and left.
- The first page should be a cover page with your name and ID.
- The number of pages should not be less than 10 pages.
- English language formulation should be correct.
- Clarity of texts and figures. No Camera-scanned images.
- Upload the report as a word document version.
- Plagiarism/Cheating check will be applied on all submitted reports. Accordingly, both copying from another student, or copying directly from internet sources without using your own words is considered plagiarism and causes the rejection of the report.

Pizzaro Restaurant

Restaurant Automation -User Requirements



Our restaurant needs a computerized system to help restaurant personnel coordinate their activities and improve their services, and for the management to track business growth and create future strategies / plans.

Requirements Description:

We are privately-owned restaurant, that is considered as medium-sized establishments. Typical problems our restaurant personnel are facing include:

- Coordination of their work activities
- Anticipating and handling periods of low/high patron traffic
- Recognizing trends early enough to take advantage of bestsellers or abandon the flops
- Lowering operating costs, and increasing efficiency/productivity and profits

Our restaurant is still operated using pen and paper methods, with little or no automation (see Figure 1). Patrons enter the facility to be greeted by a host, who often has a “dry erase” diagram of the tables, maintained on a blackboard. The host can see the status of the tables based on whether or not they or someone else physically updates the diagram. Once seated a waiter tends to the costumers by jotting down the orders onto a piece of carbon paper and delivers it to the kitchen for proper food preparation. The waiter then must periodically check back to find out when the meal is ready. When the food is done, the piece of carbon paper is saved for proper record keeping by the management. This “old fashion” system works but yields a large amount of tab receipts, wastes a lot of time and is simply out-of-date. In old fashion systems, waiters have to carry pads around to take orders, always have a working pen and be sure to keep each bill organized and “synchronized” with the proper table.

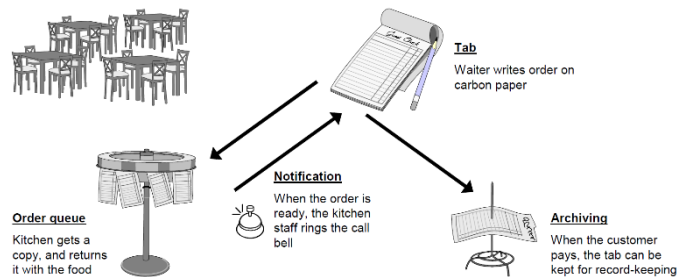


Figure 1: Old-fashioned restaurant operation.

Another issue is record maintenance. In the old system, when everything is done by paper, the management is responsible to keep all information saved and organized, which is no easy task. Everyday tabs are collected, data needs to be organized and employees need to get paid. This requires a great deal of time and attention from the managers. We need a system that computerizes restaurant operation so that all information pertaining to patron’s orders and staff activity will be conveniently shared and stored over the restaurant’s intranet. Hosts will be able to view table status with a click of a button. The wait staff will be able to enter the patron’s orders quickly and efficiently and then have it electronically delivered to the kitchen. The kitchen staff will be able to view the incoming orders and notify the proper wait staff when the food is ready. Bus boys will be able to view real-time floor status allowing them to know which tables are clean, dirty, or occupied. Most importantly, all of the restaurant information is organized and saved in the system database for the management viewing and archival. The analysis will consist of by-the-day and by-the-hour breakdowns of:

- Revenue and revenue percentage per menu item
- Menu item popularity
- Personnel efficiency
- Average turnaround time (how long patrons spend in the restaurant)
- Average preparation time (time from when the order is placed to when it is ready)

There is no more abundance of papers and long hours of punching numbers. All data is automatically collected and processed allowing management to focus on analyzing the data rather than calculating it.

Statement of Requirements

By using a touch screen the restaurant staff can quickly and efficiently log in and complete the desired task. When a waiter logs in, they are greeted with a floor status screen in which their assigned tables are coloured in. Their tables are coloured according to status; green is open, yellow is occupied, red is dirty (see Figure 2). At this point a waiter can select a table to view its tab. Once a table is selected, the staff can choose from several options. If they select to add an item to the table's tab, they are presented with various categories of food items offered. Here they can select the appropriate category and then find the desired item. For example, if a patron ordered a Caesar salad, the waiter would login, select the table, and choose "Add Item." They would then select the "Soups/Salads" from the category list, and then select the desired salad from the items presented. They are then returned to that table's screen where they can choose to perform another task or logout. This saves the waiter from walking back and forth to the kitchen to deliver and check up on food orders. Orders placed by wait-staff using the computer terminals on the restaurant floor are displayed to the kitchen staff through a queue, i.e., on a first-in, first-out basis.

The supported employee roles are: *Host*, *Waiter*, *Cook*, *Busboy*, and *Manager*. Some of the direct links between some of the staff include: Host ↔ Waiter, Waiter ↔ Cook, and Busboy ↔ Host. Every user account in the system should have its own privileges. All the role-personalized home screens for each employee will be refreshed automatically when needed (when a table is marked ready; a table's order is prepared; a host assigns a waiter to a table; etc.). The Manager should have administrative power over employee profiles: the

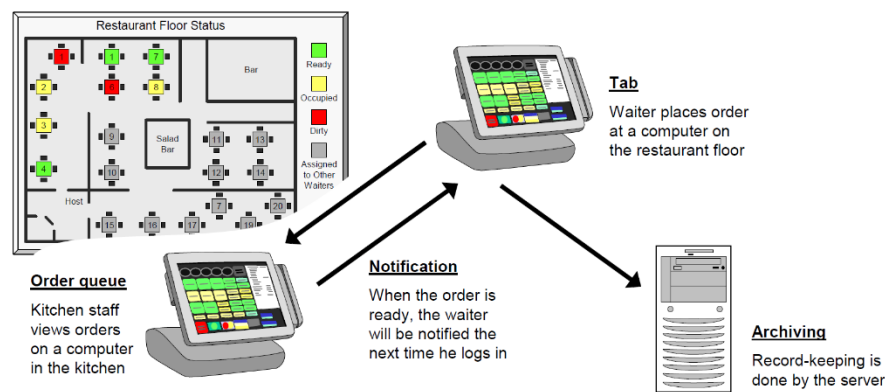


Figure 2: Restaurant automation facilitates staff coordination and record keeping.

ability to create and modify profiles, track employee activities, and authorize restricted waiter activities. If the employee is a waiter, his/her profile also contains information about the tables for which he/she is responsible. From this profile, the individual tabs for those tables can be accessed. The manager should also have ability to manage other aspects of restaurant operations, such as inventory tracking and sale analysis. There is an important choice of the type of computer terminals used by the waiters. All other personnel are either stationary, e.g., kitchen staff and hosts, or can access information at stationary terminals, e.g., busboys. If the waiters are required to use stationary terminals, they must memorize or jot down a specific table's order and then find an open computer, login and enter the information into the system. At this point everything else is done electronically. Another option is to have the waiters provided with handheld devices, which will be connected wirelessly to the rest of the system, eliminating the use of carbon paper. There are certain advantages of stationary computer terminals over handheld devices:

- (i) a small number of fixed terminals can be time-shared by multiple personnel, so this solution may be cheaper and easier to maintain;
- (ii) they are fixed, so they cannot be lost or damaged in handling.

Thus, in the first instantiation we will assume fixed terminals for the entire staff. Throughout the restaurant there will be needed computer terminals for the staff to login. The system should require each user to login, complete their task and logout. Because this will require frequent logins and logouts, it may appear as an unnecessary overhead. With a limited number of terminals, staff will not be able to remain logged in because other employees need to use the computers. Logging in and out events can be exploited to trigger data updates and reorganization, as well as for delivering user specific notifications of environment changes, such as to announce that the food is done or that a table needs to be cleaned. The only users who will be constantly logged in are the kitchen staff and the host. They will be the only people using those terminals and therefore will not require frequent logouts.

Another design issue is that of how users identify themselves with the system. The considerable options are a touch screen, a card reader, or a typical keyboard. A touch screen allows users to carry less and use the system quickly and efficiently, although they need to memorize their login information. Another option is swipe cards, which would work by having the management assign each employee a swipe card. To make this system useful, a card reader would be needed to accompany every computer station, as illustrated in Figure 2. To make new cards for employees, the management would also need a card writer, as well as blank, non-programmed cards. The staff at many restaurants is constantly changing and this ongoing employee turnaround may lead to a considerable waste in time and money for making new cards. Our final option is to use a typical keyboard system. This would work the same as a touch screen but a keyboard would take up more space and be potentially slower. A touch screen serves the same purpose as a keyboard and allows for a smaller computer station. This is selected as the working solution. Having to login frequently is annoying, particularly for cooks working with food. If you decide to have open access, then you may argue that certain restaurant areas are physically secure, so electronic security is less of a concern. The final interface issue is specifying the floor plan of the restaurant and the table arrangement. Ideally, this feature should be included with the system to allow managers to alter the floor plan by moving, adding and removing tables. Make every effort to reduce the number of clicks/keystrokes in the system interaction, while not compromising functionality and security.

Best Wishes,
Dr. Sherin Moussa