**Assignment 1**

**Description:**

A restaurant chain has reached out to your team to build a reservation system.

**Here are the details:**

* Two categories of users / customers: guest user or registered user.
* Users should be able to search for a table and reserve.
  + User doesn’t need to login to the system to reserve a table. If registered users, they can login.
  + User enters name, phone, email, date and time (date picker), and # of guests for dining and system presents available tables.
  + Tables have maximum capacity limit i.e., 2, 4, 6, or 8.
  + Different combinations are allowed, and owner accommodates the seating, for example: someone requests 8 guests and table for 8 is not available but 2 + 6, or 4+4 is available. System should combine the tables and notify owner they need to combine tables. In this case System reserves both tables.
* If a guest user i.e., not a registered user, system should prompt user to register (Optional) before finalizing the reservation.
* Registered users will have these fields:
  + Name, mailing address, billing address (checkbox if same as mailing address), Preferred Diner # (system generated), Earned points (based on $ spent i.e., $1 is 1 point), preferred payment method (cash, credit, check).
* System should track high traffic days / weekends and a hold fee is required i.e. July 4th will require valid credit card on system to reserve the table.
  + Notify user no show will have minimum $10 charge.

**Assumptions:**

If you make any assumptions to provide good user experience, please list it.

You are asked to recommend a software development process for this system.

**Answer these questions:**

1. Is the waterfall model a good choice for developing this system? Provide detailed reasoning. (5 points)

The waterfall model will provide a good foundational approach to the development of this system. There are several requirements defined that can be numbered as such:

1. System must serve two types of users: registered and guests
2. Users must be able to search and reserve tables based upon their party size. Some flexibility given to combination of different tables based upon party-size need and table availability.
3. Prompt non-registered users to register.
4. Specific defined fields should be shown to registered users.
5. System should be aware of high-traffic days and should apply holding fees when necessary.

Of these 5 requirements, further specifications as to the implication of these features are also provided, further advocating for the use of the waterfall model which defines a specific process from the start in early planning. Since the requirements can be clearly outlined and defined, a sequential model like the waterfall model is a good choice for development.

However, the waterfall process has disadvantages. As developers it is hard to tell what technologies or approaches are going to work better for the product. So, throughout the development some technologies will be used but developers might realize during a different step that there is a better or more efficient way to implement a part of the software. Since the waterfall process is not flexible. It would take more time to fix or improve the product.

1. Is iterative development leading to a single release of the system a good choice for developing this system? Provide detailed reasoning. (5 points)

Given the size and complexity of this scenario, an iterative development approach would not be a good idea. The benefit of using an iterative development is analyzing and managing the risks that arise with each iteration in the development process. This would mean that this process is better for a system that is complex. This scenario however does not call for much risk analysis since what the software needs to do is simple: have two types of users, certain features associated with each type, and ultimately allow all users to see and reserve tables. A disadvantage of using an iterative development approach is the fact that the iterations require time, money, and effort to be implemented making this approach more applicable to large-scale internal software development.

1. Is agile development with releases of small increments of software a good choice for developing this system? Provide detailed reasoning. (5 points)

Agile would give developers flexibility. During the development process once a requirement is implemented, if there is a better option, developers will re-implement the software in the next sprint with the given feedback. This way the product will be constantly and quickly updated throughout the development. Also, it would make easier to make the product scalable in case this restaurant chain grows. Since developers do not have to stick to the first determined way to design the product, when they realize that some code or implementation could be improved to help the growth, they will discuss this feedback to execute it on the next sprint.

Certain aspects of the system needs to be flexible due to the fact that (1) the restaurant chain could grow in size (number of locations and actual physical size affecting the number of tables available), and (2) the fact that a constant update has to be made to the tracking of high traffic days which is susceptible to change.

1. Discuss your first thoughts on how you will approach the solution? You should discuss in detail with reasoning. (5 points)

Our first thought on this approach was to use the waterfall development process. However, while discussing and analyzing the different options, we decided to go for the Agile development process because of its flexibility to improve the product in every sprint. To be more specific, we were trying to determine what technologies, such as database systems, programming languages, and frameworks, we wanted to use to build the software. Then, we realized that these specifications might change while we were already working on the project for many reasons. For example, if we decided to use a non-relational database and we notice that the data is well structured and that it would be better to use relational database in the middle of the development, we wanted the freedom to switch to the technology that best fits the solution. Also, there must be additional flexibility given to the software should the scalability of the system change. That is, should changes occur such as the size of the business chain, the volume of customers (and therefore users), the frequency of high traffic, or even the total amount of available tables. Therefore, we decided to use the Agile Development process.

**REQUIRED:**

Fill in this table, provide as much details possible:

| Group Member Name | What is your contribution? | Discussion Notes |
| --- | --- | --- |
| 1. Bryan Alvarez | Team discussion on each problem | We both referenced the lectures to analyze and comprehend what the different development processes involved. That way we came to an agreement on which one would work better.  We both wrote some of the answers as well as read and corrected each other’s until we came to a middle ground. |
| 1. Caleb Rogers | Team discussion on each problem | We both referenced the lectures to analyze and comprehend what the different development processes involved. That way we came to an agreement on which one would work better.  We both wrote some of the answers as well as read and corrected each other’s until we came to a middle ground. |
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**What to turn in:**

- Only soft copy uploaded on or before due date.

- No extensions.

- To get full credit provide details and diagrams (when appropriate).