Software Project Management

Lab 4 Risks, Activities, and Tasks

Graphical Password Strategy

A picture is worth a thousand words

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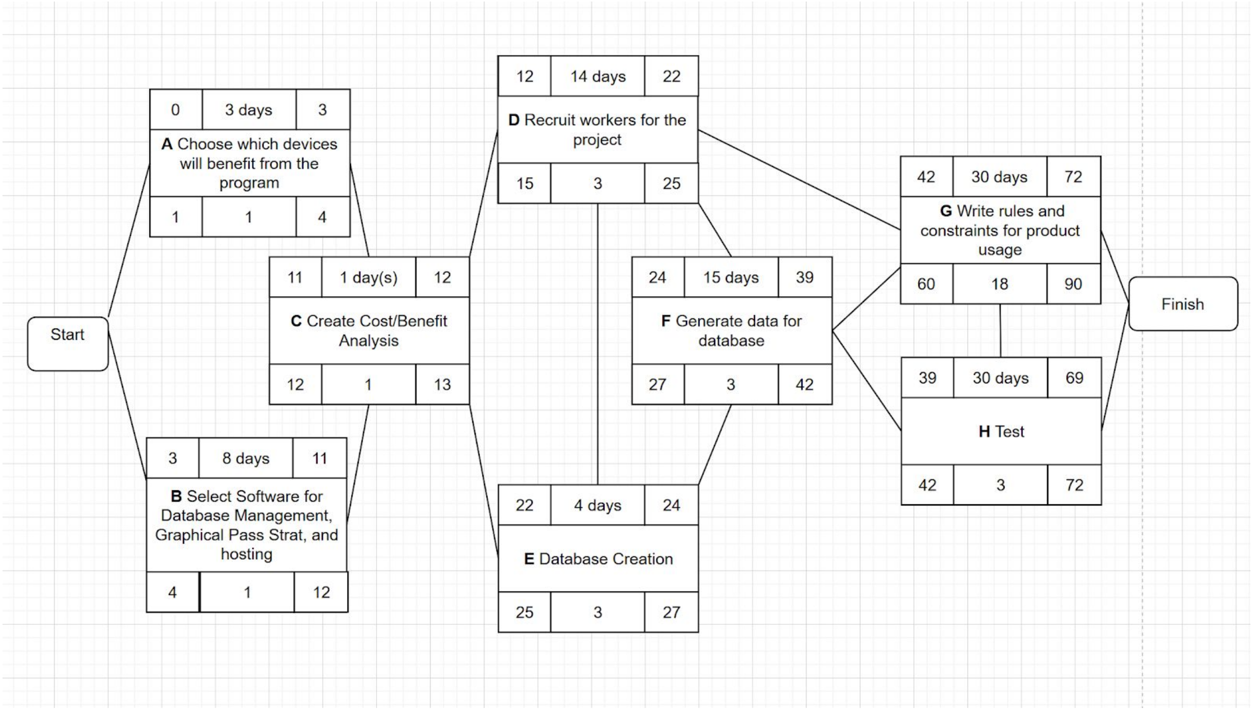
Contents

Activity Diagram

A: Product will be released for all smartphones and desktop computers
B: Software that will be used is as described in our previous proposal submission
C: Analysis required to provide a sense of security that product creation will net a profit before an investment should be made to hire and build.
D: Many tasks with many different required skill sets. Finding skilled workers will take time
E: Create Database with AWS
F: Generate data for database
H: Test product with generated data and record metadata that is found
G: Use metadata and generated data to complete rules and constraints for product usage

G and H take a long time because this product is being developed for the first time for our needs. To ensure that our cost estimates are accurate, we need to run tests to ensure reliability of our software product before making it available.


Start
0 | 3 days | 3
A Choose which devices will benefit from the program
1 | 1 | 4
3 | 8 days | 11
B Select Software for Database Management, Graphical Pass Strat, and hosting
4 | 1 | 12
11 | 1 day(s) | 12
C Create Cost/Benefit Analysis
12 | 1 | 13
12 | 14 days | 22
D Recruit workers for the project
15 | 3 | 25
22 | 4 days | 24
E Database Creation
25 | 3 | 27
24 | 15 days | 39
F Generate data for database
27 | 3 | 42
42 | 30 days | 72
G Write rules and constraints for product usage
60 | 18 | 90
39 | 30 days | 69
H Test
42 | 3 | 72
Finish

Risk Assessment

The following risks are based upon the activity diagram section.

A. The customer may not necessarily appreciate the compatible devices for this project. The trouble with different devices is the time of development will vary due to programming languages and the corresponding skills of developers. The countermeasure for this is to open beta test the platform across some selected platforms to determine some statistics about what user group to target. This will allow for some cost estimations as to where the developer time is better spent.

B. The first risk associated with the project is the selection of our database provider. Initially this could be hosted on a single service and called upon from any remote API needing to query information. While this works in testing, if this service goes down, the entirety of our user base will lose access to their devices or content. A countermeasure for this problem will require more costs associated but less risk. Uploading this data to a cloud service with regular backups is the most ideal scenario to ensure that there is no loss or corruption of user data. If there is too much demand on the server, the responses and speed of querying will become slow. Using a cloud service will ensure that we can distribute the load over multiple querying services.

C. Another large risk associated with this project is associated with finding appropriately skilled workers to complete tasks. This project places a heavy priority on reliability, availability and most importantly, security. The system must be built in a way that it is available all day every day and in a way that user data can be stored safely with the use of an appropriate hashing function and reliably to ensure that users can always access their information and only their information. Since this password strategy is to be released on multiple platforms including IOS and Android and on multiple devices from Apple, Microsoft, Google, etc it is vital that the hired team has a diverse skill set that can cover all of these platforms. As of right now, the team consists of 3 members with a diverse skill set in IOS, Android and the ability to build appropriate APIs for the job and the entire team has knowledge in SQL however there is still a lack of understanding of how to use AWS to meet the associated cloud computing requirements. This is a growing field with a lot of considerations that need to be taken into account in order to ensure data security because as of 2019 that is the most major concern businesses, organizations, and individuals have about using the cloud. The real issue then is setting up the right set of hiring restrictions that give enough of a margin to train the new employee based on the values of our company, while still hiring an individual with proficient enough knowledge of cloud systems management that they can complete the required tasks with little to no guided instruction spare a few questions here and there.

A countermeasure that can be put into place to effectively hire a fourth member for the team is to host a meeting amongst the existing members of the team with the intention of critically deliberating what strengths and weaknesses the team currently has and then writing the job requirements to fill the gap of the team's current weaknesses while simultaneously complementing the strengths of the team. In order to ensure that the team remains impartial during the meeting, it could be beneficial to have a third party sit in on this meeting. The tasks of hosting this critical meeting, finding a fourth member for the meeting, and the training of the new hire were all considerations that were not made in the previous submission but will likely have little to no effect on the delivery time of the overall project. This is due to the large float period between tasks G and H in our activity diagram which were purposely given that large float period in order to accommodate changes like this.

D. There is also a risk associated with database corruption. If the designed database was to get corrupted, a large number of users would lose their information or in the worst case scenario, since in cloud computing all of the information is available from anywhere within the network, there might be a data leak. This data leak or data corruption can be caused in 2 main ways: The first is if the database gets the same query requested from two remote locations at the same time resulting in a deadlock, race conditions, or an overwrite, and the second is if the database accepts incorrect data. In this sense, the database must ensure that algorithms are in place to handle race conditions and the database must be designed in a way that it is robust enough to not accept incorrect data.

Some countermeasures that can be put in place to mitigate these risks are to make sure the database and the cloud that the database is a part of are both distributed. The cloud will be distributed since Amazon's IaaS AWS is being used so the next step is to ensure that the database is distributed so that it can initiate fault recovery in the worst case scenarios.

A countermeasure that can be used to handle race conditions, deadlocks, and data overwrites are acknowledgement flags and a First-come-first-serve (FCFS) algorithm. This will ensure database security and reliability by making sure that there are no "ties" within the system. If two requests come in at the same time, they will be loaded into a queue and the queue will be processed one at the same time. Realistically, it would make more sense to send an error message to both requesting users informing them of the situation because if two people in two distinct locations are requesting the same data from a Graphical Password Strategy then it could be possible that one of these users is a hacker. In this case, an error message will allow the authenticated user to take the necessary precautions to protect their data.

A countermeasure that can be used to ensure that the database does not accept incorrect data and as a result has as little of a hackable surface as possible is to set rules and guidelines in place to only accept requests of a certain format. Any queries that do not meet these guidelines should be prompted to try again and send data back to the service provider that informs them of the error and what caused it. This data can then be used to train the model further so that the system can become even more robust and potentially handle the error without throwing an error down the line. In order to set these rules and guidelines in the first place, Test data should be used so that the password strategy can be trained on potential types of incorrect data before it is ever launched.

E. A more personal risk associated with our team in particular may be overwork. Since this project is being handled by a team of individuals that were contracted to do the work, many of the individuals on the team are also preoccupied with multiple other projects from multiple different organizations and as a result their productivity may struggle. Furthermore, since team members may be working for extended periods of time to hit their goal of delivering three functionality points in a day, there may be a loss of motivation to perform optimal work. This will worsen if there is a potentially slow day where less than three functionality points are delivered even if it follows a very productive day where more than three functionality points were delivered.

   In order to mitigate the risk of overwork, the team could propose to each of the organizations they are working with to hold a share in the completion of this project. This way the sub project is of importance to all organizations associated with any of the team's current members and the team is able to shift their priorities solely to the task at hand. Unfortunately, this still leaves the issue of poor productivity.

   In order to mitigate the risk of poor productivity, sub goals can be set between objective deadlines to give developers a further sense of accomplishment when they complete part of a task. This motivation will allow them to complete objectives on time. Poor productivity can also be the result of not meeting a deadline and in order to mitigate this the team should adopt a formally informal work environment. This will act to alleviate the stress of time while still maintaining the importance of time in association to the task at hand. This puts the onus of time management solely on the project manager and allows developers to keep working under the blissful ignorance of a schedule. If handled appropriately, this should affect the overall completion schedule of this project by little to none.

F. An associated risk that was touched on in Risk C but not elaborated on was learning curve delays. Given the size of this semi-detached project, and the small size of the team, it will not be possible to have one individual assigned one task at all times. For the scope of this project, members will have to be assigned to teams where a single member can be a part of multiple teams and then teams will have to be assigned to a task with a team lead assigned beforehand. This means that for each created team, there will have to be at least one expert in their field as well as a potentially less experienced member working alongside them. Tasks like appropriating user requests by implementing SQL query restrictions and generating data for the database can be easily picked up by any member of the team as everyone’s expertise covers such fields however more specific tasks like IOS development, Android Development, and API development will require teams to do training amongst themselves. Although this was not reflected in the organization’s objectives, it will be heavily reflected in a team’s necessary sub objective in accomplishing the organization’s objective.

In order to handle this risk effectively, the entire organization should add another activity to its roster which includes member allocation to teams, team distribution to tasks, and then time for training each team with the necessary information needed to begin to tackle the problem. This will be a general training designed to build foundational knowledge on the required information to complete the team’s task and as a result should only take 1-3 days to complete each training depending on the size of the task at hand. For a topic like cloud computing and database distribution, it can take up to 3 days but for a simple task like helping an IOS developer understand Android development it can take as little as a single day. It will be the assigned team leader’s job to host and execute the training and it will be the responsibility of team members to attend their training. Since a single member can be a part of multiple teams, it will be the organization’s responsibility to organize a training schedule such that there are no conflicting trainings and as many training sessions can be run in tandem as possible. The total estimated additional time needed for this new task will be 7 days. A single day will be needed to create teams and distribute tasks and the remaining 6 days will be used for training. This will put the estimated delivery time of the project at 3.5 months however the risk of not including this training might take the delivery project up to 4 months or more.

Resource Allocation

Quality Assurance Team

The quality assurance team will be responsible for the following tasks and have the following roles.

- ➔ A: Choose which devices will benefit from the software
  The QA Team will handle resource allocation per which device is the best platform to target to get the biggest user base. The responsibility of the team is to determine what platform will have the highest user base which will drive the focus of the development team. For example, the team's task will be to determine whether android or IOS is the correct route and if so, which type of devices are using this application the most.

- ➔ C: Develop Cost benefit Analysis
  The QA team will create a cost benefit analysis diagram to evaluate project resources. This will include a comparison between mobile platforms, cellular platforms, and desktop platforms to determine the best payback rate to best focus the application teams time. The cost benefit analysis will also look into things like project budgeting and the requirements to begin scaling the application.

- ➔ H: Product Testing
  The QA team will be responsible for handling all product testing joint with the Data Management team and Application Development team. The QA team will provide documentation that explains passing or failing tests based on the project requirements in order to give the application team a run down on what issues exist in the program. QA will also be responsible for keeping up to date on logging the updates to the application including bug fixes and changes.

Data Management Team

The data management team handles all backend tasks like managing the user base and how their data is routed and interacts with the application. They are responsible for security and the database applications.

- ➔ E: Database Creation
  The data management team will create the database, data structures, and the system design required to ensure there will be no loss to user data. Additionally they will be responsible for the security associated with the data. For instance, only authorized users should be able to access data for a specific user account.

- ➔ F: Database Test Data
  Test cases will be required in order to validate the program for quality assurance reasons and to prove that the application is functioning properly from the Application team and Quality team's ends. The data team will be required to produce data that validate their queries for retrieval of user information. The user information will be very sensitive so the test data will be very crucial to the QA team's testing phase.

Application Team

The application team is responsible for the application development.

- ➔ B: Select Hosting software, platform for graphical password, and Data management
  The application team is familiar with their skills, strengths and weaknesses. They will be responsible for selecting development platforms that they like to work with and believe will get the app done in the most efficient amount of time.

- ➔ D: Recruit Workers for the project
  The application team will handle the recruitment phase of the project. They will determine which users are best to hire for the task given they are the ones deciding the development platforms of the project.

- ➔ G: Rules and constraints
  The application team will be responsible for writing the guidelines and terms of service regarding the use of the graphical password authentication. This will be a message communicated to the users upon their first use of the application to give an overview of what is recommended usage by the developers. It will explain best practices of the application and where it is best used such as a way to authenticate your phone. It will also explain where it is not best used such as authenticating yourself into your online banking accounts.