MET CS682

Development Process & Risk Analysis

Assignment 2

Author: Fariborz Norouzi

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Contents

1. Introduction

This document represents assignment2, which it is beginning to plan systems analysis and design for an app called *TripForYou* introduced in Assignment 1.

In the part one, I evaluated each of Waterfall, Rapid Application Development (RAD) with 3-8 iterations and Agile Processes in terms of how suitable they would be for this particular project.
Then I determined a combination of waterfall and RAD processes where those are most appropriate for this project and I explained why these would work best.

In the second part, I identified five risks for a new app called TripForYou and I selected two risks from these items and provided detail description of risk, categorization and how dealing with those risks.

2. Part One. Selection of a Suitable Development Process

2.1 Evaluate Waterfall Process (See Appendix A for more detail)

The Waterfall Process is a non-iterative step-by-step single sequence software development model which process on just one direction of flows that can be divided into different phases include: Planning, Requirements Analysis, Design, Implementation, Testing and system. (Tong, 2016)
There are some advantages and disadvantages by using waterfall model for *TripforYou* application according to the assumptions presented.
Advantages of using Waterfall process for developing *TripforYou* application are:

- The waterfall model produces well documentation where it is so important subject for IT teams to modify application by relying requirement documents.
- The waterfall model is a good choice for small and mid-size project (Pogrebnoy,. Yatskevich, 2017) which they are clear at the start project like *TripforYou* app that has similar functionality same many other small or mid-size on line travel services.
- This approach is a proper solution for distributed team with offshore location, because half of the team according to the assumption is distributed.

Disadvantages of using Waterfall process for developing *TripforYou* application are:

- The waterfall model usually uses successfully for small or trivial project where all requirements are clearly known and they change rarely over the life cycle of the project. (Tong, 2016) But in this particular project, during the life cycle some features may change frequently.
- The one of the original issues of waterfall approach is it comes up with requirements which is the result of data gathering, not end user necessity.
- In waterfall approach it is very difficult to go back on stages of project and change something was wrong, because for modifying project should start very beginning phase of project again. (Pogrebnoy. Yatskevich. 2017)
- It is not proper model for randomly change requirement like UI in *TripforYou* in order to better-fit customer use so that they spend minimum amount of time in the application while planning a trip.
- This method is not suitable for project like *TripforYou*, which need to demonstrate intermediate version to stakeholder because they need to make sure project is processing on the right direction.
- Member of team idling or time wasting is other issues of waterfall model, because it is a sequential process and if each phase is not completed, then next phase does not allow to start.

2.2 Evaluate Rapid Application Development (RAD) (See Appendix B for more detail)

"Rapid application development (RAD) describes a method of software development, which heavily emphasizes rapid prototyping and iterative delivery."(Powell, 2016) In other word, RAD is based on waterfal model with several times iteration. A project manager with work manages RAD teams individually and they demonstrate screen mockups or prototypes to product owner. There are a numbers of benefites to using RAD method and usually the advantages of using this method outweight the disadvantages.(Powell, 2016)

Advantages of using RAD process for developing *TripforYou* application are:

- RAD process focus on most important features by spiliting of process,
- RAD process focus on meeting end user requirements (Mone, 2015)
- RAD methodology quickly identifies any issues and resolve error immidiately, then it is suitable for frequently change during the life cycle of *TripforYou* application. Foe instance it can be easily added dashboard features or social media components to application. (thakur, 2016)

- Multi task assign to each member within the iteration of RAD method could be reasonable way to prevent team members idling. (James, 2012)
- less structured manner (Thakur, 2016)
- By considering initial delivery is to be in four months then it can be concluded RAD model is proper chosing model when time is more important than cost. (Mone, 2015)

Disadvantages of using RAD process for developing *TripforYou* application are:

- Early versions of RAD process usually are incomplete systems
- Useful for larger projects (Thakur, 2016)
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2.3 Evaluate Agile Process (See Appendix C for more detail)

Agile Software Development is a time boxed, iterative and face to face approach, where describes which requirements evolve through the communication and collaboration effort of self-organizing cross-functional teams. Agile method is combination of iterative and incremental model. (Abu Bakar, 2014) Team members in Agile Development Process are self-managing with focus on team communication and they demonstrate only completed works.

Advantages of using Agile process for developing *TripforYou* application are:

- Flexibility and speed are key advantages of agile process. For instance, short cycle in Scrum where it is 2 – 4 weeks sprint for first version or prototype is a benefit of using this method. (Braude & Polnar, 2017)
- Focus current priority is other important benefit of using Agile methodology.
- Self-organizing cross-functional teams and team trust can cause of motivated teams.

Disadvantages of using Agile process for developing *TripforYou* application are:

- Lack of documentation is a key disadvantage of Agile methodology (Abu Bakar, 2014)
- According to the assumption, due some of the development team are offshore location, then pair programming, face-to-face communication & collaboration and close interactions with end-users are so hard for Agile approach.

2.4 Selecttion of *a* suitable development process for *TripforYou* application

The Tripforyou application will develop using combination of Waterfall and Rapid Application Development - Phased (RAD _ Phased) with three iterations processes to deliver the required functional of application. In fact, RAD _ Phased follows Waterfall process in the each iteration. The Waterfall process is appropriate method for developing first version of application, because it produces well documentation where it is so important subject for IT teams to modify application by relying requirement documents. Project manager is responsible for recruitment six qualified programmer according the project requirements before starting project. It is a good choice for building first version of *TripforYou* application with priority of the most important features in one month. Then after test and confirmation, start next version and iteration of this procedure until finish final version at the end of the four months. For first version of app we focous on reserve hotel rooms, cancel booking rooms and on line payment for booking hotel rooms. These functional system requirements are explicit and clear where there are lot of similar applications, which have already been implemented. Also half of team members are offshore location, then waterfall would be suitable process for developing first version because clear requirements and well geared to offshore members are characterestics of waterfall process. RAD - Phased process has chosen for the rest of the project due the waterfall approach is hard to go back on project and change. Agile model is not suitable for this project due distributed team. RAD - Phased has been preferred than RAD - prototyping in this particular project because each iteration of RAD - Phased can deliver an applicable version of software where is valuable for end user and stakeholders while prototype is not executable. The second version, more focus on VR technology and making Virtual Tour that it will complete approximately after two months. This section is a good opportunity for keeping motivation in team members, for instance project manager can give promotion to two main programmers to team leaders after releasing first version of application. All eight members divided to two team works where all of them work with project manager. One leader manage four co-located members and other one will direct and control offshore members. Project manager could assign multi task to each member in order to prevent team members idling. For instance all team members should have experience for analysis, coding and testing program. System should be integrated to gather and all functions work correctly at the final iteration of RAD - Phased methodology with a one month period. Integration with other

systems like Tableu to making dashboard inorder to visualization data report for using end user side and admin side is other important add features in final version. Also integrated system with social network by adding some component like visible share buttons. (Woodrow, 2012)

3. Part Two. Risk Analysis

3.1 Identyfing Five Risk of Project

- Since the project is on a very tight deadline (four Months) with less than needed number of developers, there is a possibility of it not finishing on time resulting in additional costs and loss of future business

- Since application requires backwards compatibility with flash, this may result in limitations of platforms, which it can use.

- Offshore development team does not have enough experienced developers, which may result in the project deliverable being lower in quality.

- Since the customer requirements may change within SDLC, where influence the *TripforYou* application, this may result in uncontrollable budget and time to modify software application.

- Insufficient testing team time to check and validate operational all features on all types of browser, OS and different kinds of devices such as desktop computer, laptop, mobile phone and wearables VR technology. (WALLMÜLLER' 2013)

3.2 First Selected Risk - Risk of Offshore Development Projects

3.2.1 Description of the Risk

Offshoring means that a vital organizational function is taking place in another part of the world. It should note that many of the risks involving offshoring critical functions. (DeHondt, Nezlek.2010). One of the common risks in this field is, Offshore development team does not have enough experienced developers, which may result in the project deliverable being lower in quality.

Prioritizing Offshore Development Projects Risk

No.	Title	**Estimated likelihood of occurring** (L: 1-10 with 1 lowest likelihood)	**Estimated impact** (I: 1-10 with 1 lowest impact)	**Estimated cost of managing** (M: 1-10 with 1 lowest cost)	**Priority number (<u>lowest number handled first</u>)** (11-L) *(11-I)*M
1	Offshore Risks	6	9	8	5*2*8=80

Table 1: Managing the Cost & Schedule Risk of Offshore Development Projects (Westney, 2001)

3.2.2 Risk Classification

Offshore Development Projects risk is type of **Organizational Risks** because working with Offshore that are potentially beyond reach introduces a number of other challenges that they are result of people's actions.

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3.2.3 Dealing with the Risk

We can manage the "Offshore developer" risk by **conquest**: It is good to ask for their resumes or at least for brief profiles of them and to talk to prospective team members before engaging them.

3.3 Second Selected Risk - Deadline

3.3.1 Description of the Risk

Since the project is on a very tight deadline with less than needed number of developers, there is a possibility of it not finishing on time resulting in additional costs and loss of future business. (Braude & Polnar, 2017)

Prioritizing Deadlines Risk

No.	Title	**Estimated likelihood of occurring** (L: 1-10 with 1 lowest likelihood)	**Estimated impact** (I: 1-10 with 1 lowest impact)	**Estimated cost of managing** (M: 1-10 with 1 lowest cost)	**Priority number (<u>lowest number handled first</u>)** (11-L) *(11-I)*M
1	Deadlines	8	9	8	3*2*8=48

Table 2: Managing the Cost & Schedule Risk of Projects Deadlines (Braude, Polnar. 2017)

3.3.2 Risk Classification

Deadlines risk is type of **Organizational Risks** because factors that lead to this risk is result of people's actions.

3.3.3 Dealing with the Risk

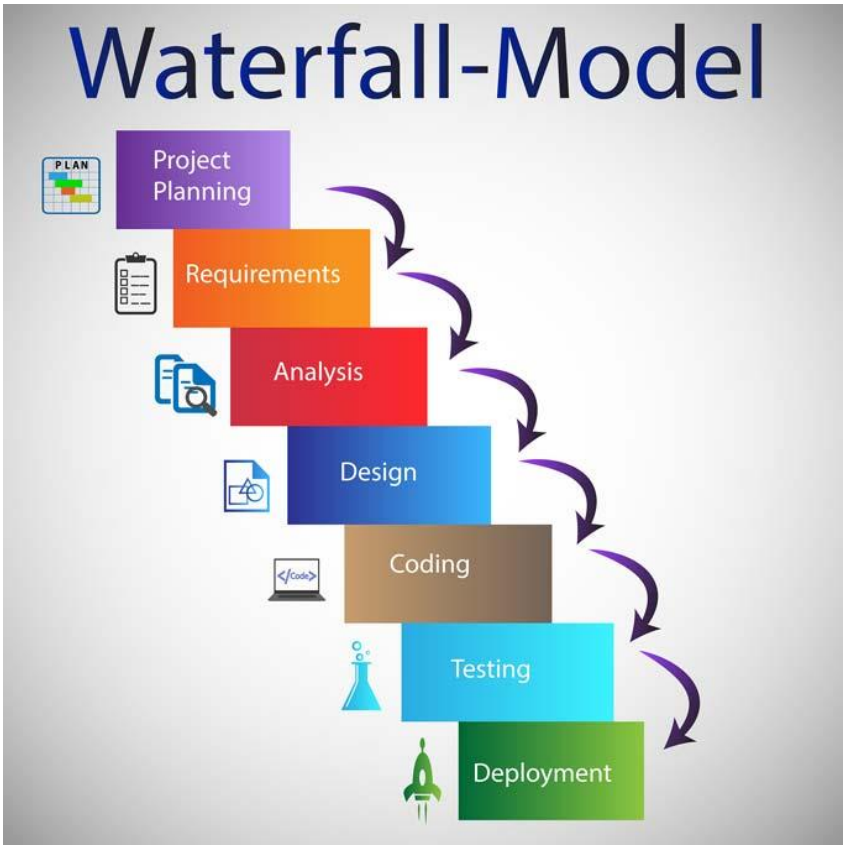
We can manage the "Deadlines" risk by **conquest**:
Since the deadline is not movable, use time boxing to insure completing most important features with quality in mind, moving non-essential features to the next sprint. This will also help residual risk; keep pushing features to the next sprint. (Braude & Polnar, 2017)

4. Appendices:

4.1 Appendix A

Waterfall Process

The Waterfall Process is a non-iterative step-by-step single sequence software development model which process on just one direction of flows that can be divided into different phases include: Planning, Requirements Analysis, Design, Implementation, Testing and system. (Tong, 2016)



Picture 1, Waterfall Model, Source: https://www.outsource2india.com/software/mobile-applications/project-methodologies.asp

As you can see on picture 1, The waterfall model is a linear sequential (non-iterative) which progress flows in one direction through the phases of project planing, requirements, Analysis, Design, coding, testing and deployment. “Waterfall methodology results in a project schedule with 20-40% of the time invested for four phases, 30-40% of the time to coding and the rest dedicated to testing and implementation” (Tong, 2016) Waterfall applies to natural planners and it produces detailed documentation of processes. (Pogrebnoy, Yatskevich. 2017). Some characteristics of waterfall approach are:

- Plan-driven development
- Secured cost and time variables
- Clear expectations of a product’s functionality
- Project management is easier due to ready specifications (Pogrebnoy, Yatskevich, 2017)

There are some advantages and disadvantages by using waterfall model for *TripforYou* application according to the assumptions presented.

Advantages of using Waterfall process:

- The waterfall model produces well documentation where it is so important subject for IT teams to modify application by relying requirement documents.
- The waterfall model is a good choice for small and mid-size project which they are clear at the start project
- This approach is a proper solution for distributed team with offshore location,
- Waterfall is simple and easy to understand and use.

Disadvantages of using Waterfall process:

- The waterfall model usually uses successfully for small or trivial project where all requirements are clear and they change rarely over the life cycle of the project. (Tong, 2016) However, in this particular project, during the life cycle some features may change frequently.
- The one of the original issues of waterfall approach is it comes up with requirements which is the result of data gathering, not end user necessity.
- In waterfall approach it is very difficult to go back on stages of project and change something was wrong, because for modifying project should start very beginning phase of project again. (Pogrebnoy, Yatskevich, ,2017)
- It is not proper model for randomly change requirement like UI in *TripforYou* in order to better-fit customer use so that they spend minimum amount of time in the application while planning a trip.
- This method is not suitable for project like *TripforYou*, which need to demonstrate intermediate version to stakeholder because they need to make sure project is processing on the right direction.
- Member of team idling or time wasting is other issues of waterfall model, because it is a sequential process and if each phase is not completed, then next phase does not allow to start.

4.2 Appendix B

Rapid application development (RAD) Process

"Rapid application development (RAD) describes a method of software development, which heavily emphasizes rapid prototyping and iterative delivery."(Powell, 2016) In other word, RAD is based on waterfal model with several times iteration. A project manager with work manages RAD teams individually and they demonstrate screen

mockups or prototypes to product owner. There are a numbers of benefites to using RAD method and usually the advantages of using this method outweight the disadvantages.(Powell, 2016). RAD is less structure approach (Thakur, 2016) because it divided to smaller project where deliver individually. “The major characteristic of the RAD model is that it focuses on the reuse of code, processes, templates, and tools.” (Thakur, 2016).

Some Characterestics of Rapid application development (RAD) are: (Powell, 2016)

- Measurable Progress
- Quickly Generate Productive Code
- Compartmentalization of System Components
- Rapid, Constant User Feedback
- Early Systems Integration
- Simple Adaptability

Advantages of using RAD process:

- RAD process focus on most important features by spiliting of process,
- RAD process focus on meeting end user requirements (Mone, 2015)
- RAD methodology quickly identifies any issues and resolve error immidiately, then it is suitable for frequently change during the life cycle of *TripforYou* application. Foe instance it can be easily added dashboard features or social media components to application.(Thakur, 2016)
- Deliverables are easier to transfer as high-level abstractions, scripts, and intermediate codes are used.
- Encourages user involvement (Thakur, 2016)
- Multi task assign to each member within the iteration of RAD method could be reasonable way to prevent team members idling. (James, 2012)
- By considering initial delivery is to be in four months then it can be concluded RAD model is proper chosing model when time is more important than cost. (Mone, 2015)

Disadvantages of using RAD process:

- Early versions of RAD process usually are incomplete systems
- Requires Modular Systems
- Difficulty Within Large-Scale Projects
- Demands Frequent User Interfacing
- Depends Upon Skilled Developers

4.2 AppendixC

Agile Process

Agile Software Development is a time boxed, iterative and face to face approach, where describes which requirements evolve through the communication and collaboration effort of self-organizing cross-functional teams. Agile method is combination of iterative and incremental model. (Abu Bakar, 2014) Team members in Agile Development Process are self-managing with focus on team communication and they demonstrate only completed works.

Some Characterestics of Rapid Agile process are: (Powell, 2016)

- Individuals and interactions
- Working software
- Customer collaboration
- Responding to change and welcome changing requirements
- Focus highest priority to satisfy the customer
- face-to-face conversation
- Simplicity
- Pair Programming
- Focus on Good Design
- Self-organizing teams
- adjusts team behavior accordingly
- promote sustainable development
- Build projects around motivated individuals

Advantages of using Agile process for developing *TripforYou* application are:

- Flexibility and speed are key advantages of agile process. For instance, short cycle in Scrum where it is 2 – 4 weeks sprint for first version or prototype is a benefit of using this method. (Braude, Polnar. 2017)
- Focus current priority is other important benefit of using Agile methodology.
- Self-organizing cross-functional teams and team trust can cause of motivated teams.

Disadvantages of using Agile process for developing *TripforYou* application are:

- Lack of documentation is a key disadvantage of Agile methodology
- According to the assumption, due some of the development team are offshore location, then pair programming, face-to-face communication & collaboration and close interactions with end-users are so hard for Agile approach.

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