

Understing Behealty development process & Risk

The purpose of this document is to give you practice exploring development processes and identifying risks when embarking on beHealthy system.



January 25, 2024

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1/8/2024

MET CS 682 ASSSIGNMENT 2

Mahim Choudhury

1. USE THIS TEMPLATE: Please respond by using this Word template, leaving the headings and the gray text unchanged—but exclude the *hints* section (at the end) from your solution.
2. OBSERVE LIMITS: Observe the page and paragraph limitations; however, you may include as many appendices—additional to the required Appendix 1—as you wish. All appendices should be referred to in the main text.
3. USE ChatGPT **but only for Question 1.1.1**. We would like you to answer this question using chatGPT where possible because we feel that this is the way such writing will be created going forward. We want you to practice good use of AI generation, including your verification, re-prompting, editing, and improvement.
4. Document your chatGPT interaction as in Appendix 1 (use Document Map to facilitate navigation). You are also encouraged to do outside research to support your response but use the *References* section as indicated and observe plagiarism rules carefully, including the citation of sources, the use of quotes, and acknowledgement of modifications of external sources.
5. NAME YOUR FILE: Include your last name in the file name of the assignment. (Example: SmithMichael\_CS682Assignment1.docx)

Hints are provided at the end of this document. We will provide feedback comments and will use our best judgement in terms of the evaluation criteria listed.

The Scenario for this assignment is as follows: *BeHealthy* specializes in providing healthy nutrition and food delivery for corporations, specifically targeting small businesses and startups.

The following project characteristics apply—every one of them should influence your response:

1. The CEO believes that *BeHealthy* must prioritize user experience and integrate with social media, but investors want health and safety features to be the top priority, partially to avoid liability exposure—at least for the initial development.
2. Your initial team consists of one experienced systems analyst, a subject area expert, and one developer experienced with programming of this type of system. Five additional developers and two QA personnel are usually needed for this type of project to be delivered in the timeframe of the initial release based on your previous experience of working on similar projects.
3. The initial team reside in time zones with substantial difference. The experienced developer is very talented; however, they have a history of avoiding overtime, even at critical times.
4. To keep costs low, the CEO would like to hire as many offshore developers and QA staff as possible, even though they would probably be in very different time zones, potentially with deep cultural differences. To some degree, allow for pandemics, war, sanctions, and unrest to impact the offshore development team.
5. You are to assume the timeframe of the initial release and or iterations depending on your process selection

# Process

## 1.1 Comparison of Processes

### Waterfall Strength

Considering the project characteristics for BeHealthy, one significant strength of the Waterfall development process lies in its ability to facilitate clear communication and negotiation among stakeholders with conflicting priorities. The structured approach of Waterfall, with distinct phases and detailed documentation, provides a platform for aligning the priorities of the CEO and investors. This strength becomes crucial in a scenario where the CEO emphasizes user experience and social media integration, while investors prioritize health and safety features to mitigate liability exposure.

The comprehensive requirement analysis phase in Waterfall allows for detailed discussions and negotiations between stakeholders. By having a well-defined roadmap, the project team can systematically address conflicting priorities, ensuring that critical aspects related to health and safety are addressed in the initial stages, in line with investor concerns. The sequential nature of Waterfall enables the team to negotiate and make informed decisions on prioritization, fostering a collaborative environment for navigating the challenges posed by differing stakeholder expectations.

### Waterfall Weakness

Waterfall development has many weaknesses that can have demoralizing effects when choosing it for any project. One of the key disadvantages is that the design must

be completely specified before programming begins and that a long time elapses between the completion of the system proposal in the analysis phase and the delivery of the system (usually many months or years)[1]. In the context of Behealty, this can be bitterly true especially since the the CEO and investors have different requirement priorities. It will take longer to align both parties and decide on the best route to go with before the system proposal is made ready. Even after that, things may change in the meantime, i.e. change of business needs, change of CEO, etc. and thus the long time gap between the analysis and the delivery of the system could cause a massive disruption to the development of beHalthy system.

### RAD Strength

Rapid Application Development iterative cycles enable the development team to deliver functional prototypes rapidly, facilitating early user testing and feedback incorporation. This approach ensures that evolving requirements and stakeholder preferences can be accommodated efficiently, enhancing the overall responsiveness of the development process to the dynamic needs of BeHealthy. This agility is particularly advantageous in a project characterized by conflicting priorities between the CEO's emphasis on user experience and social media integration and investors' focus on health and safety features. Once version 1 is implemented, work begins on version 2. Additional analysis is performed based on the previously identified requirements and combined with new ideas and issues that arose from the users’ experience with version 1. Version 2 then is designed and implemented and work immediately begins on the next version [1]. For beHealthy, at the end of version 1, both stakeholders can adjust their priorities based on user experience of the version 1 and decide how to proceed with version 2 in the next iteration phase.

### RAD Weakness

Since customer feedback is an essential part of Rapid Application Development’s iterative phased approach, it can be big weakness too when customer feedback isn’t always readily available. If the client is unavailable at the time of critical decision-making or unable to make a timely decision, the quality and speed of product development may be affected [2]. For Behealthy, imagine after one or two iterations, the customer or the stakeholders were not available to provide their feedback, it will significantly delay the development flow of the entire system. It will create various uncertainty and lack of motivation amongst the requirements analysts, program management, and the developers. Eventually, this could potentially undermine the reliability and trustworthiness of the BeHealthy platform, particularly in an industry where precision and adherence to health standards are paramount.

### Agile Strength

One of the key strengths of agile is the short delivery timeframe. making them beneficial for BeHealthy's initial release or iterations. With Agile, BeHealthy can break down the project into smaller, manageable iterations called sprints, typically ranging from one to four weeks. Each sprint results in a potentially shippable product increment, allowing BeHealthy to release functional features to users early and often. This iterative delivery model aligns well with the need for rapid feedback and validation, enabling BeHealthy to adjust its course based on user input and changing market needs. It focuses on the clean delivery of individual pieces or parts of the software and not on the entire application [3]. This allows one to easily gauge and commit to a timeframe in which they can provide a functional system to the stakeholders leveraging the agile’s continuous delivery practice.

### Agile Weakness

One weakness of Agile methodology in the context of beHealthy project would be the potential difficulty coordinating and managing offshore development teams.It get’s even more difficult when they reside in different parts of the world with different time zone and cultural background. Agile methodologies heavily rely on communication, collaboration, and transparency within cross-functional teams. However, when offshore development teams are involved, challenges such as language barriers, cultural differences, and varying work practices may hinder effective collaboration and coordination. Given agile development methodologies requiring co-location of the development team, this seems to be a very unrealistic assumption [1]. Therefore, in the context of beHealthy, it could be big weakness when it comes to deciding which development process to pick.

## A1.1 (ChatGPT re Comparison of Processes)

Prompt: for the following development process, provide one strength relative to this project I described earlier. Focus on what you consider the most important strength of the development process specific to the characteristics of the given scenario. Notice the difference in requirement priorities between the CEO and the investors and other characteristics I mentioned earlier.

Response:

Considering the project characteristics outlined for BeHealthy, the Waterfall development process demonstrates several strengths that align with the unique challenges and priorities presented. The clarity and structure inherent in Waterfall provide a well-defined framework for addressing conflicting stakeholder priorities. Given the CEO's emphasis on user experience and social media integration, along with investor concerns about health and safety features, Waterfall's phased approach allows for comprehensive requirement analysis and negotiation between stakeholders. This ensures that critical features related to health and safety are meticulously addressed in the initial stages, aligning with investor priorities to mitigate liability exposure.

Moreover, the Waterfall model is well-suited to the challenges posed by the initial team's geographical dispersion and the potential inclusion of offshore developers. Its sequential nature allows for effective coordination among team members across different time zones, facilitating collaboration during distinct phases. Additionally, the detailed documentation characteristic of Waterfall supports the incorporation of offshore developers, despite potential cultural differences and external disruptions such as pandemics or geopolitical issues. While acknowledging the need for flexibility in the face of external challenges, Waterfall's strengths in communication, negotiation, and structured development make it a suitable choice for navigating the complexities inherent in BeHealthy's project characteristics.

## 1.2 Project Methodology and Roadmap

Rapid Application Development (Phased)

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Iteration** | **Phase** | **Objective** | **Duration** | **Notes** |
| 1 | Analysis | Gather detailed requirements and features for version 1 | 2 weeks | Systems Analyst, Subject Area Expert |
| Development | Write code for core features for version 1(i.e. User friendly interface, some social media connection) | 4 weeks | Developer(s) |
| Implementation | Build a runnable version of the system v1 | 1 week | Developer(s) |
| Testing | Test various functionalities of system v1 and provide feedback | 1 week | QA, Stakeholders, customers, Systems Analyst, Subject Area Expert |
| **Iteration** | **Phase** | **Objective** | **Duration** | **Notes** |
| 2 | Analysis | Adjust version 1’s detailed requirements and features for version 2 based on feedback | 2 weeks | Systems Analyst, Subject Area Expert |
| Development | Write new code or adjust V1 code for version 2 (i.e. implement AES 256 bit encoding for secure data transfer, etc.) | 4 weeks | Developer(s) |
| Implementation | Build a runnable version of the system v2 | 1 week | Developer(s) |
| Testing | Test various functionalities of system v2 and provide feedback | 1 week | QA, Stakeholders, customers, Systems Analyst, Subject Area Expert |
| **Iteration** | **Phase** | **Objective** | **Duration** | **Notes** |
| 3 | Analysis | Adjust version 2’s detailed requirements and features for version 3 based on feedback | 2 weeks | Systems Analyst, Subject Area Expert |
| Development | Write new code or adjust V2 code for version 3 ( i.e. Refine interface, social media interactions, security features, etc.) | 4 weeks | Developer(s) |
| Implementation | Build a runnable version of the system v3 | 1 week | Developer(s) |
| Testing | Test various functionalities of system v3 and provide feedback | 1 week | QA, Stakeholders, customers, Systems Analyst, Subject Area Expert |

## 1.3 Explanation of Process

The RAD Phased approach enables rapid prototyping and iterative development, allowing the project team to respond promptly to changing requirements and stakeholder preferences. This flexibility ensures that BeHealthy can adapt to evolving market demands and stakeholder priorities effectively. It is also worth noting that RAD takes good advantage of both waterfall and agile methodologies. This makes it a great choice considering the complexity of behealthy’s characteristics. The iterative nature of RAD Phased allows for the rapid delivery of functional prototypes, facilitating early user testing and feedback incorporation. This strength is particularly advantageous for BeHealthy, as it enables the project team to validate design assumptions, gather user feedback, and adjust priorities accordingly. The use of waterfall methodologies within each phase of RAD allows the system to be developed by an offshore team from various time zones to avoid any disruptions due to war, pandemic, etc. The well-versed documentation from during the analysis phase allows room for even unskilled labor to follow instruction and do their job. Since the team has an experienced skilled developer on board with them, it helps to get a good estimation of timeframe albeit there will be some unknown requirements. Other characteristics of the project where there was conflict of initial requirements between the CEO and the investors can also be resolved with iterative actions. Th e analysis phase identifys the overall system

concept, and the project team, users, and system sponsor then categorize the requirements into

a series of versions [1]. Different versions or prototypes will allow the stakeholders and/or customers to provide feedback which in terms can help removing the initial conflicts. Regarding mitigating the weakness mentioned in section 1.1.4, the team can proactively engage stakeholders and establish clear and frequent communication channels in between the development and implementation weeks. It will allow continuous short feedback to the developers. This approach ensures developers remain on course, mitigating the risk of incomplete feedback if stakeholders or customers are unavailable at the end of each iteration.

# Risk Analysis

## 2.1 Five Risks

### Stakeholder Unavailability

* Underlying Risk Cause: Busy schedules or unavailability of key stakeholders during critical decision-making points.
* Risk: Stakeholders or clients may not be available for timely feedback or decision-making.
* Potential impact: Delays in decision-making, stalled progress in the SDLC process, and increased project duration.

### Offshore Team Communication

* Underlying Risk Cause: Difference in time zones and cultural nuances may hinder effective communication.
* Risk: Miscommunication or delayed communication with offshore team members mayhappen.
* Potential impact: Delayed project timelines, misunderstandings in requirements, and decreased productivity due to communication barriers.

### Lack Of Experienced Developers

* Underlying Risk Cause: Single experienced developer may not have enough experience developing similar projects in the past.
* Risk: Lack of previous experience may cause wrong estimation of project deliverables, cost, and resources.
* Potential impact: Going over budget, design failures due to lack of experience, delayed prototype delivery.

### Scope Creep

* Underlying Risk Cause: Evolving requirements and stakeholder expectations during the iterative development process.
* Risk: Uncontrolled expansion of project scope beyond initial specifications may happen.
* Potential Impact: Increased development time and costs, resource allocation challenges, and potential conflicts over project priorities

### Initial Requirements Conflicts

* Underlying Risk Cause: Misalignment of priorities between the CEO, who prioritizes user experience and social media integration, and investors, who prioritize health and safety features.
* Risk: Conflicting requirements may lead to difficulties in defining the scope and priorities for each RAD iteration, causing delays and impacting resource allocation.
* Potential Impact: Iterative cycles may be disrupted, leading to rework, schedule delays, and increased project costs due to frequent adjustments and realignments of priorities.

Complete the chart below with risk titles from above.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Risk No. | Title | Estimated Likelihood of occurrence (L: 1-10) | Estimated impact (I: 1-10) | Estimated cost of managing (M: 1-10) | Priority number (Handled in order lowest to highest)((11 – L)\*(11 – I)\*M) |
| 1 | Stakeholder Unavailability | 7 | 8 | 7 | 4\*3\*7=84 |
| 2 | Offshore Team Communication | 7 | 6 | 5 | 4\*5\*5= 100 |
| 3 | Lack Of Experienced Developers | 7 | 8 | 8 | 4\*3\*8= 96 |
| 4 | Scope Creep | 5 | 6 | 8 | 6\*5\*8=240 |
| 5 | Initial Requirements Conflicts | 9 | 7 | 7 | 2\*4\*7= 56 |

## 2.2 Selected Risk

5 = Initial Requirements Conflicts

### 2.2.1 Likelihood

The likelihood of occurrence for the risk of Initial Requirements Conflicts is high due to the inherent differences in priorities between the CEO and investors at the onset of the project. Research suggests that conflicting stakeholder interests are common in project initiation phases, especially in projects with multiple stakeholders and diverse objectives [4]. Furthermore, studies have shown that misaligned expectations and unclear requirements contribute significantly to project failure rates, highlighting the importance of addressing conflicts early in the project lifecycle [5]. Working on a project involves different types of people who all have different opinions and preferences which makes this risk very common in most projects.

### 2.2.2 Impact

The concrete impacts of this risk on the project are significant. It can lead to project delays, increased costs, and compromised quality if not addressed effectively. Conflicting requirements can result in rework, scope creep, and stakeholder dissatisfaction, ultimately jeopardizing the success of the project [5]. Research indicates that projects experiencing scope changes and requirements volatility are more likely to exceed budget and schedule constraints, highlighting the critical role of effective requirement management in project success [6]. Additionally, unresolved conflicts may erode stakeholder trust and undermine project team morale, further exacerbating project risks and challenges [7]. Therefore, the potential impact of Initial Requirements Conflicts underscores the importance of proactive risk management and stakeholder engagement throughout the project lifecycle.

### 2.2.3 Risk Type

The risk of Initial Requirements Conflicts is primarily organizational. It stems from differences in stakeholder priorities, communication gaps, and divergent objectives between the CEO and investors.

### 2.2.4 Risk Management

To mitigate the risk of Initial Requirements Conflicts, a proactive approach is essential. In my opinion, risk avoidance is preferred over conquest to prevent potential disruptions to the project timeline and budget. In the context behealthy, the initial conflict in requirements between the CEO's prioritization of user experience and social media integration, and the investors' emphasis on health and safety features, presents a significant risk that requires careful consideration in terms of risk management strategies. Especially, when the system involves people’s health, offshored unskilled workers, and budget concern, it is safe to avoid conflicting requirements instead of conquest where risk mitigating could get costly and time consuming. Conquest involves negotiation, compromise, and extensive communication efforts, which may not always lead to satisfactory outcomes. By avoiding this risk altogether, the project team can prevent these negative consequences from occurring. To manage the risk of initial conflicts in requirements by avoidance, the project team can implement proactive measures aimed at preventing or mitigating the occurrence of conflicts. One approach is to conduct thorough stakeholder analysis and engagement early in the project lifecycle to identify and address potential sources of conflict [8]. By involving key stakeholders, including the CEO and investors, in collaborative requirements elicitation and prioritization sessions, the team can foster a shared understanding of project objectives and priorities [9]. Early analysis and stakeholder engagement help identify potential sources of conflict or other risks, allowing the project team to make informed decisions about how to address them. For Behealty, after through analysis, the stakeholders can decide to either completely avoid this risk or go with one concrete requirements in the early stage.

# References other than chatGPT

[1] Whitten, B. (2007). Systems analysis & design methods. (7th ed.). New York, NY: McGraw-Hill Irwin.

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[3] Brush, Kate. (November 2022). “Agile software development”. [https://www.techtarget.com/searchsoftwarequality/definition/agile-software-development](https://www.techtarget.com/searchsoftwarequality/definition/agile-software-development%20) .Accessed [January 25th, 2024].

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# Evaluation

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