

American International University-Bangladesh (AIUB)

Department of Computer Science

Faculty of Science & Technology (FST)

Project Title

HealthSync Hub

Submitted By

Semester: Summer_21_22		Section:	Group Number:	
SN	Student Name	Student ID	Contribution (CO3+CO4)	Individual Marks
1	Tauhid Hasan	22-46438-1		
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The project will be Evaluated for the following Course Outcomes

CO3: Select appropriate software engineering models, project management roles and their associated skills for the complex software engineering project and evaluate the sustainability of developed software, taking into consideration the societal and environmental aspects	Total Marks	
Appropriate Process Model Selection and Argumentation with Evidence	[5 Marks]	
Evidence of Argumentation regarding process model selection	[5Marks]	
Analysis the impact of societal, health, safety, legal and cultural issues	[5Marks]	
Submission, Defense, Completeness, Spelling, grammar and Organization of the Project report	[5Marks]	

Description of Student's Contribution in the Project work

<p>Student Name: Student ID: Contribution in Percentage (%): <u>Contribution in the Project:</u> ▪ Contribution Description 1 ▪ Contribution Description 2</p> <p>_____ Signature of the Student</p>
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1. OBJECTIVE:

The objective is to select an appropriate process model for the software development of the HealthSync Hub project. Through thorough analysis and evaluation, we aim to identify a hybrid methodology that integrates elements of Scrum and Kanban to effectively manage the development process, streamline workflow, and enhance productivity. The selected process model should align closely with the project's requirements, promote collaboration among team members, and ensure efficient delivery of high-quality software solutions. Additionally, we seek to assess the rationale and consistency of the chosen methodology using appropriate tools and techniques, such as expert review, comparative analysis, and prototyping. The goal is to establish a robust and adaptive software development process that enables the successful delivery of the HealthSync Hub platform while meeting stakeholder expectations and project objectives.

2. SOFTWARE DEVELOPMENT LIFE CYCLE:

The software we are developing is a comprehensive healthcare management system called HealthSync Hub. This system aims to streamline various aspects of healthcare management, including patient records, appointments, medication management, and diagnostic tests. Given the sensitive nature of healthcare data and the critical importance of accuracy, security, and reliability in healthcare software, it is crucial to select an appropriate development methodology.

After careful analysis of the nature and environment of the software, we have chosen the Agile software development methodology, specifically a hybrid model combining Scrum and Kanban practices.

Software projects inevitably change in many aspects including requirements, circumstances, and stakeholders [1], which require agility in complex domains. Based on this natural need for agility, people have invented varying agile approaches and methods to meet the need to be compatible in the market, have shorter development cycles, fewer costs, and can move and change quickly [2, 3]. Among the agile methods, Scrum and Kanban are common in the software industry [4] and they are considered the two effective agile methods that handle and manage the progress of software development [3, 5, 6]. Scrumban method, which is a Hybrid of Scrum and Kanban methods, was invented by these values and principles. The values above focus on working software, individuals and interactions, customer collaboration, and reacting to change quickly [7].

Scrum has limitations directly affecting application results, such as lack of work visibility, local optimization, large-scale implementations, and changing task priorities [8, 9, 10]. Similarly, as all other methods do, Kanban has some problems and challenges as well [11, 12]. Considering the individual limitations and challenges of each method, there are also some views that blending more than one method will yield better results than individual use. For instance, there are views that the limitations in Scrum can be mitigated by using Kanban alongside Scrum and they can complement each other [9, 13, 14, 15].

Hybrid Methodology:

a) Roles and Responsibilities:

- Scrum Master: Facilitates the development process, removes impediments, and ensures adherence to Agile principles.

- Development Team: Comprises cross-functional members responsible for designing, developing, testing, and delivering increments of the software.

b) Kanban Board Setup:

- Utilize a Kanban board to visualize the workflow and manage tasks.
- Columns on the board represent different stages of the development process, such as backlog, analysis, design, development, testing, and deployment.

c) Workflow and WIP Limits:

- Define Work in Progress (WIP) limits for each column to prevent overloading and maintain a smooth flow of work.
- Encourage the team to pull tasks from the backlog based on capacity and priority, ensuring a balanced workload.

d) Continuous Delivery:

- Emphasize continuous delivery of features and enhancements without fixed sprint cycles.
- Encourage the team to focus on delivering value incrementally and frequently, prioritizing the most valuable features for users.

e) Scrum Master and Daily Meetings:

- The Scrum Master facilitates daily stand-up meetings to synchronize the team, discuss progress, and identify any blockers or impediments.
- Daily meetings ensure transparency, alignment, and accountability among team members.

f) Backlog Management:

- Maintain a prioritized product backlog containing user stories, features, and technical tasks.
- The Product Owner collaborates with stakeholders to refine and prioritize backlog items based on user needs and business value.

g) Continuous Improvement:

- Encourage a culture of continuous improvement and learning within the team.
- Conduct regular retrospectives to reflect on the development process, identify areas for improvement, and implement changes iteratively.

h) Flexibility and Adaptability:

- Allow for flexibility and adaptability in the development process, enabling the team to respond to changing requirements and priorities.
- Empower team members to make decisions and adjustments to the workflow as needed, promoting autonomy and ownership.

i) Metrics and Monitoring:

- Monitor key metrics such as lead time, cycle time, and throughput to assess the efficiency and effectiveness of the development process.
- Use metrics to identify bottlenecks, optimize workflow, and improve overall performance.

Benefits of the Hybrid Model:

- Flexibility: The hybrid model offers flexibility and adaptability, allowing the team to adjust the development process as needed.
- Continuous Delivery: By focusing on continuous delivery, the team can deliver value to users more frequently and respond to feedback in a timely manner.

- Transparency and Collaboration: Daily meetings and visual boards promote transparency, collaboration, and alignment among team members.
- Continuous Improvement: Regular retrospectives enable the team to reflect on their practices, identify areas for improvement, and implement changes incrementally.

3. ROLE AND RESPONSIBILITY:

1. Product Owner/Project Manager (TAUHID HASAN):

Role: Responsible for defining the product vision, prioritizing features, and ensuring project alignment with business objectives.

Responsibilities:

- Define the product vision and roadmap.
- Prioritize features based on business value.
- Gather requirements and feedback from stakeholders.
- Ensure timely delivery of project milestones.

2. Scrum Master (TAUHID HASAN):

Role: Facilitates the agile process, removes impediments, and ensures team adherence to agile principles.

Responsibilities:

- Facilitate sprint planning, daily stand-ups, and retrospectives.
- Remove obstacles hindering team progress.
- Ensure adherence to agile methodologies.
- Foster a culture of continuous improvement within the team.

3. Development Team Member (MOSTAFIJUR RAHMAN):

Role: Design, develop, test, and deliver increments of HealthSync Hub.

Responsibilities:

- Participate in sprint planning and estimation.
- Collaborate with the Product Owner to understand requirements.
- Develop high-quality software increments.
- Conduct daily stand-ups and contribute to team collaboration.

4. Stakeholder (Effat Mukarom):

Role: Provide feedback, validate requirements, and ensure project alignment with user needs and regulatory standards.

Responsibilities:

- Provide feedback on features and user experience.
- Validate requirements and ensure alignment with user needs.
- Ensure regulatory compliance.
- Collaborate with the team to address challenges and risks.

5. Domain Experts(Debabrata Basak):

Role: Provide domain-specific knowledge and expertise to ensure the accuracy and relevance of the HealthSync Hub software.

Responsibilities:

- Offer insights into healthcare industry standards, regulations, and best practices.
- Collaborate with the development team to ensure alignment with healthcare domain requirements.
- Provide guidance on user workflows, data management, and security considerations.
- Review and validate system functionalities to ensure they meet healthcare industry standards.

6. Quality Assurance Specialists(Debabrata Basak, Tauhid Hasan):

Role: Responsible for ensuring the quality and reliability of the HealthSync Hub software through testing and validation processes.

Responsibilities:

- Develop and execute test plans, test cases, and test scripts to validate software functionalities.
- Perform various types of testing, including functional testing, regression testing, and user acceptance testing.
- Identify, document, and track software defects and issues using issue tracking systems.
- Collaborate with the development team to resolve defects and ensure the delivery of high-quality software increments.

4. IMPACT:

a. Societal Impact:

- HealthSync Hub software may have societal implications concerning access to healthcare services, especially if it facilitates remote consultations or access to health information.
- It might also influence healthcare delivery models, such as telemedicine, and contribute to the digitalization of healthcare records, potentially altering patient-doctor relationships and healthcare workflows.

b. Health Impact:

i. Improved Medication Adherence:

- Electronic prescription software allows healthcare providers to transmit prescriptions directly to pharmacies, reducing the likelihood of errors in medication transcription.
- Patients receive accurate and legible prescriptions, which can enhance their understanding of medication regimens and increase adherence to prescribed treatments.

ii. Enhanced Medication Management:

- HealthSync Hub enables healthcare providers to access patients' medication histories and drug interactions in real-time.

- Healthcare professionals can make informed decisions about prescription choices, dosages, and potential side effects, leading to safer and more effective medication management.

iii. Timely Prescription Renewals:

- Electronic prescription software sends automated alerts for prescription renewals, ensuring that patients receive timely refills of their medications.
- This feature reduces the risk of treatment interruptions and prevents patients from experiencing gaps in therapy, which could compromise their health outcomes.

iv. Patient Engagement and Empowerment:

- HealthSync Hub offers patients convenient access to their electronic prescriptions through secure online portals or mobile applications.
- Patients can review their medication lists, access educational resources, and communicate with healthcare providers, fostering greater engagement in their own care and promoting shared decision-making.

v. Reduction of Medication Errors:

- Electronic prescriptions minimize the potential for errors associated with handwritten prescriptions, illegible handwriting, or misinterpretation of dosage instructions.
- The software includes built-in safety checks and alerts for drug allergies, contraindications, and duplicate prescriptions, reducing the likelihood of adverse drug events and medication errors.

c. Safety Impact:

- HealthSync Hub must adhere to safety standards to ensure that patient data remains secure and protected from breaches or unauthorized access.
- It should also promote safe and reliable communication channels between healthcare professionals and patients to prevent errors or misunderstandings that could compromise patient safety.

d. Legal Impact:

- Compliance with healthcare regulations and data protection laws, such as HIPAA (Health Insurance Portability and Accountability Act), GDPR (General Data Protection Regulation), or other regional regulations, is crucial.
- The software must ensure patient confidentiality, data integrity, and secure transmission of sensitive health information to avoid legal repercussions.

e. Cultural Impact:

- HealthSync Hub should consider cultural sensitivities and diverse healthcare practices to ensure that the software is accessible and relevant to users from different cultural backgrounds.
- Language options, culturally sensitive content, and user interface design should be tailored to accommodate diverse user populations.

f. Environmental Impact:

Research shows that in 2022, around 6.7 billion prescriptions were dispensed (source: satc.com). One potential benefit of HealthSync Hub could be a reduction in paper usage, as digital prescriptions replace physical ones. This could translate to fewer trees needing to be cut, contributing to environmental conservation.

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