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Projects 1

Term 2 Assessment

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•Please note that all references used in this assignment were understood and paraphrased in our own words, not merely copied, and pasted.

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Section A

Distinctive Project Characteristics

- **A project has a unique purpose.**
 - According to the Project Management Institute (2021), each project in a technology development context should possess a clearly stated goal, such as creating a distinctive technological product, service, or outcome.
- **A project is temporary.**
 - In agreement with Project Management Institute (2021), a project in a technology development context has a definite start and end.
- **A project drives change and enables value creation.**
 - As stated in Project Management Institute (2021), a project in a technology development context is initiated to fulfil a specific need or desire. Its goal is to achieve a particular objective that transforms the current technological landscape into one that is more desired or valued in the future.
- **A project is developed using progressive elaboration.**
 - In the opinion of the Project Management Institute (2021), projects in a technology development context should be developed in stages and increments.
- **A project requires resources.**
 - In a technology development context, resources include people, hardware, software, and other assets (Project Management Institute, 2021).
- **A project should have a primary customer or sponsor.**
 - As stated in Project Management Institute (2021), the major role of sponsorship in a technology development project must be assumed by someone for the project to succeed. Typically, the project sponsor provides the project's financing and guidance.
- **A project involves uncertainty.**
 - As claimed by the Project Management Institute (2021), since every technology development project is unique, it can occasionally be challenging to specify its goals accurately, project the time it will take to finish, or estimate its cost.

Project Management Overview

Project management in the context of technological innovation involves the systematic planning, organizing, and overseeing of tasks, resources, and timelines to achieve specific technological objectives. It includes overseeing the work of interdisciplinary teams, controlling risks, and adjusting as needed during a project. It is about efficiently guiding a project from conception to completion while optimizing resources and mitigating potential obstacles, all to drive innovation and achieve technological advancements.

Project Challenges

- **Scope:** Meeting end-user expectations involves ensuring that the prototype meets the specified requirements set out by stakeholders, such as continuously tracking vital signs, utilizing AI for health predictions, and enabling emergency notifications. Additionally, user-friendliness, easy setup, and privacy considerations are essential aspects of meeting end-user expectations.
- **Time:** With a timeline of six weeks, it is crucial to meet deadlines at every phase of the project to ensure timely completion. Unrealistic time frames could lead to rushed development, compromising the quality of the prototype or missing essential features.
- **Budget:** The budget of R150,000 sets financial constraints on the project. Limited financial resources may affect the ability to procure the necessary materials and hire skilled personnel for the project. It is essential to allocate resources correctly to ensure that the prototype meets end-user needs without overspending.

Innovative Planning Tools

Brainstorming sessions with the team proved to be a powerful tool in this project. These sessions helped the team clearly define the objectives of the project, such as continuous monitoring of vital signs and AI-based health issue predictions. By generating and capturing innovative ideas, the team could address crucial aspects like emergency notifications, user-friendliness for a broad age range, and privacy and data protection measures.

The brainstorming sessions facilitated a comprehensive understanding of the product, including the desired end-user experience and the specific demographics it aims to target. For example, discussions helped the team envision how different age groups would interact with the device and what features would make it accessible and easy to manage for everyone.

Stakeholder Identification

Healthcare Providers: Including doctors, nurses, and other medical professionals who will use the monitoring device to track patient health.

Patients: End-users of the healthcare monitoring device, whose needs and preferences should be considered in its design and functionality.

Healthcare Institutions: Hospitals, clinics, and healthcare facilities where the device will be deployed and integrated into existing systems.

Manufacturers: Companies or organizations responsible for designing, developing, and manufacturing the monitoring device

Software Developers: Developers responsible for designing and maintaining the software interface of the monitoring device, including user interfaces and data management systems.

Investors: Individuals or organizations that have invested in the development, manufacturing, or deployment of the monitoring device and have a financial interest in its success.

Defining Success in Projects:

Success could be measured by the device's ability to accurately monitor and track relevant health indicators, leading to improved patient outcomes, and early detection of health issues. Also, if the project is within budget and meets time requirements it could be considered a success. The team also considered the satisfaction of all stakeholders involved, including healthcare providers, patients, manufacturers, software developers, and investors. As well as compliance with regulatory standards and obtaining necessary approvals as factors to project success.

Lifecycle Management:

1. Concept phase

- **Idea generation:** through brainstorming the team generated ideas for the healthcare device by doing market research, analysing emerging technology trends such as AI as well as analysing stakeholder inputs.
- **Feasibility Analysis:** the team should conduct a feasibility analysis to determine factors such as what demand is the project fulfilling and what are the constraints such as financial resources.
- **Technical analysis:** at this phase, the team specifically analysed the technical feasibility of integrating AI for health predictions and emergency notification features within the given budget and timeline.
- **Creating a concept:** this includes outlining the features, functions, and intended use of the healthcare device.

2. Development phase

- **Detailed design:** the team translated the conceptual design into detailed technical specifications such as materials, components, and the manufacturing process of the healthcare device.
- **Prototyping:** the team builds prototypes as proof of concept to validate their design, functionality, and performance.
- **Project objectives:** the team prioritized features such as continuous vital sign tracking and AI capabilities while considering cost-effective materials and manufacturing processes to stay within budget.

3. Implementation phase

- **Marketing:** The launch of the healthcare device included marketing and promotional activities as well as creating a sales plan. The team focused on marketing strategies that highlight the device's unique features and benefits, emphasizing its user-friendliness and privacy protections.
- **Training:** Provide training to healthcare providers, patients, and other end-users on how to use the healthcare device effectively.

4. Closeout phase

- **Project evaluation:** The team evaluated the project's performance and outcomes against its objectives, including factors such as market acceptance, user satisfaction, and financial returns.
- **Documentation:** Document the project's success or failure in meeting objectives and provide recommendations for future improvements within the healthcare technology company.
- **Evaluation:** Evaluate project performance against specific success criteria, such as the accuracy of vital sign monitoring and user satisfaction with the device's ease of use.
- **Closure and lessons learned:** formally close the project by obtaining sign-off from stakeholders, closing out project contracts and accounts, and conducting a post-project review to identify lessons learned and areas for improvement in future projects.

Dealing with Resource Constraints:

The team found a constraint where a key member fell ill at a key point of the project, this caused time delays and knowledge gaps which affected team morality and productivity. The team dealt with this problem by encouraging cross-training among team members to ensure that multiple individuals are familiar with critical tasks or responsibilities. The team also introduced flexible scheduling which allowed the team to work on overlapping tasks and reduce dependency on specific individuals. We encouraged documentation of tasks and processes to help with knowledge sharing among team members. This can help mitigate knowledge gaps and ensure continuity of work in the absence of key individuals.

Scope Control

Scope creep refers to the gradual expansion or addition of features, requirements, or deliverables beyond the originally defined scope of a project as stated by Benvenuti (2020). To prevent scope creep the team implemented the following:

1. **Clearly Define Project Scope:** Establish a well-defined project scope statement outlining the objectives, deliverables, boundaries, and exclusions of the project. In the context of developing a prototype for the wearable healthcare monitoring device, the project scope should be clearly defined to include objectives such as continuous tracking of vital signs, AI integration for health

predictions, emergency notification capabilities, and user-friendly features for a wide range of ages.

2. **Regular monitoring and reports:** The team enhanced scope control by establishing regular monitoring and reporting mechanisms to track project progress against the defined scope.
3. **Engage Stakeholders Early:** Involve key stakeholders, including healthcare providers, patients, regulatory bodies, and investors, early in the project to gather requirements, set expectations, and prioritize features. Gathering input on features related to vital sign monitoring, AI prediction algorithms, emergency notification protocols, and user interface design to ensure alignment with stakeholder expectations.
4. **Change Control Process:** Implement a formal change control process to assess, evaluate, and approve proposed scope changes. The team defined criteria for assessing the necessity and feasibility of proposed changes, particularly those related to enhancing user-friendliness, ensuring privacy and data protection, or improving device performance.
5. **Impact Assessment:** Conduct impact assessments for proposed scope changes, considering their implications on schedule, resources, and budget. Specifically analyse the impact of proposed changes on vital sign tracking capabilities, AI prediction algorithms, emergency notification functionalities, and user interface enhancements to prioritize changes that align with project objectives within the specified budget and timeline.

The team also recognizes that not all scope changes are detrimental to the project and understands that some changes are necessary for the success of the healthcare device project. The team implemented things such as analysing the impact of the change, prioritizing what we felt were the most important changes as well as maintaining open communication with stakeholders to ensure alignment on the rationale and implications of beneficial scope changes.

Section B

Understanding Prototypes

In agreement with Benvenuti (2020), a prototype is a preliminary version or a scaled-down model of a healthcare device that is developed to test and validate its design, functionality, and feasibility before full-scale production or implementation.

Organizational Understanding

1. Structural frame

- The team understood that the structural frame focuses on the organization's formal hierarchy, roles, processes, and systems.
- The structural frame helped them to analyse the organizational structure, including reporting relationships, decision-making processes, and communication channels.

2. Human resources frame

- We introduced the human resource frame, which emphasizes the people within the organization, their skills, motivations, and relationships.
- Encouraging the team to consider the human aspects of project management, such as team dynamics, leadership styles, and communication preferences.

3. Political frame

- We discussed the political frame, which views organizations as arenas where power dynamics, conflicts, and competing interests shape decision-making and outcomes.
- I encouraged the team to develop strategies for navigating organizational politics, building alliances, and managing conflicts constructively to advance project goals.

4. Symbolic frame

- We introduced the symbolic frame into our team, which focuses on organizational culture, values, rituals, and symbols that shape shared meanings and identities.
- This frame helped the team to understand the organizational culture and how it influences attitudes, behaviours, and perceptions toward projects.

Agile Methodologies:

According to Thompson. K (2022), the SCRUM framework is a popular agile methodology used in software development that emphasizes iterative and incremental development, collaboration, and flexibility. SCRUM divides the project into short iterations called sprints, typically lasting two to four weeks, during which a cross-functional team works to deliver a potentially shippable product increment.

1. Forming a SCRUM team

- Assembling a cross-functional SCRUM team consisting of members with diverse skills, including software developers, hardware engineers, UI/UX designers, healthcare professionals, and data scientists for the development of the healthcare device. This ensures that the team has the necessary expertise to address the complexity of integrating vital sign tracking, AI prediction, and emergency notification features into the device.

2. Product backlog creation:

- Collaborate with stakeholders, including healthcare professionals, users, and investors, to create a prioritized product backlog listing all features, functionalities, and requirements of the wearable healthcare monitoring device prototype. The backlog should list all requirements including continuous vital sign tracking (heart rate, blood pressure, blood oxygen levels, AI prediction algorithms, emergency notification capabilities, and user-friendly setup and management features.

3. Sprint planning

- Define sprint goals and identify tasks required to complete the selected backlog items, estimating their effort and complexity. Tasks related to vital sign tracking, AI integration, and emergency notification should be given priority to ensure that the prototype meets the specified requirements within the allocated resources.

4. Daily SCRUM meetings

- Hold daily SCRUM meetings, or stand-ups, to synchronize the SCRUM team's activities, share progress updates, and discuss any impediments or challenges. Given the interdisciplinary nature of the team and the complexity of integrating various features into the device, effective communication and collaboration are paramount.

5. Sprint review

- Conduct sprint review meetings at the end of each sprint to demonstrate the completed work to stakeholders, gather feedback, and potentially adjust the product backlog based on insights gained. For the healthcare device project, stakeholders may include healthcare professionals, potential users, regulatory bodies, and investors.

Until the project is finished, steps 2 through 5 will be repeated. With the efficient application of the Scrum methodology throughout the wearable healthcare monitoring device prototype development, the team could capitalize on its collaborative and iterative approach to produce an effective solution that satisfies the requirements of stakeholders while staying within the budget and schedule constraints.

Combining Agile Techniques

According to Atlassian (n.d.a), Kanban is a visual system used to manage and keep track of work as it moves through a process. It shows new work, work in progress, and work completed specifically, and you can track the development stages of the wearable healthcare monitoring device. Integrating Kanban boards with SCRUM sprint backlogs provides a comprehensive view of the project's progress and helps identify bottlenecks or areas for improvement. Given the tight timeline and budget constraints of the project, identifying, and resolving bottlenecks efficiently is crucial to staying on track. Atlassian (n.d.b) states that Kanban's emphasis on continuous improvement complements SCRUM's iterative approach by providing opportunities for reflection, learning, and adaptation. Integrating Kanban with SCRUM encourages the team to identify and implement process improvements incrementally. Combining Kanban with SCRUM fosters a culture of collaboration within the team and with stakeholders, facilitating better coordination and alignment toward project goals.

Communication in Project Management:

For the development of the wearable healthcare monitoring device prototype project, key communication tools can help facilitate effective collaboration, coordination, and information sharing among team members, stakeholders, and external partners. Such as:

1. Project Management Software (e.g. Jira)

- Project management software provides a centralized platform for managing tasks, tracking progress, and organizing project-related information.
- Real-time updates and notifications keep team members informed about project changes and updates.
- The team utilized features such as Kanban boards and Scrum boards using Jira to visualize workflow, prioritize tasks, and monitor the status of project milestones.

2. Collaboration Tools (e.g., Microsoft Teams, Slack):

- Collaboration tools facilitate real-time communication and collaboration among team members, enabling them to discuss project-related matters, share updates, and ask questions.
- Integrations with project management software allow for streamlined workflows, enabling team members to access project-related information and updates directly within the collaboration platform.

3. Document Management Systems (e.g., Google Drive, SharePoint):

- Document management systems provide a centralized repository for storing and organizing project documents, reports, specifications, and other relevant materials.
- The team used Google Drive to store and organize project documents, including design specifications, technical documentation, and regulatory requirements.

4. Video Conferencing Software (e.g., Zoom, Microsoft Teams):

- Video conferencing software enables virtual meetings, allowing team members, stakeholders, and external partners to communicate face-to-face regardless of geographical barriers.
- Scheduled meetings and calendar integrations help coordinate team schedules and ensure that project meetings are held efficiently and punctually.
- The team used video conferencing software to leverage screen-sharing capabilities during meetings to present prototypes, review design iterations, and demonstrate project milestones.

5. Email and Phone Communication:

- While traditional, email and phone communication remain essential tools for exchanging formal communications, providing updates, and addressing urgent issues.
- Email allows for detailed documentation and archiving of project-related communications, while phone calls enable immediate, direct communication for resolving critical issues or clarifying complex matters.

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