**Proyecto Buin Zoo**

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**Subject:**

* Capstone 003D

**Professor:**

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## APT Project Description

This project aims to develop a mobile application that allows visitors to Buin Zoo to access detailed and up-to-date information about each of the animals that inhabit the park.

**Main Functionalities:**

* **Informative cards:** Each animal will have a detailed card that will include the following:
  + Common and scientific name
  + Physical characteristics (weight, size)
  + Natural habitat
  + Diet
  + Threats faced
  + Geographical distribution in the world
* **Multimedia content:** The textual information will be complemented with descriptive audios and videos that allow visitors to get to know the animals in a more immersive way.
* **Collectable album:** Users will be able to create a digital album where they can save the photos they take with each animal. Upon completing the album, they will receive a special reward.
* **Navigation system:** An interactive map of the zoo will be integrated to help visitors locate the animals and plan their route.

**Benefits:**

* **Education:** Promotes learning about wildlife and species conservation.
* **Entertainment:** Offers an interactive and fun experience for visitors of all ages.
* **Marketing:** Positions Buin Zoo as an innovative park committed to environmental education.

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## Relationship of the APT Project with the Graduate Profile Competencies

Our APT project is directly related to the graduate profile competencies due to:

* **Performing certification tests:**
  + **Application:** In the development and deployment phase, it is crucial to ensure the quality of the software through exhaustive testing. This involves verifying that the application works correctly on different devices and operating systems, and that it complies with security and performance standards.
  + **Reason:** To guarantee an optimal user experience and avoid technical problems that could affect the zoo's reputation.
* **Offering IT solution proposals:**
  + **Application:** During the design phase, it will be necessary to analyze the zoo's current processes and propose technological solutions that optimize information management and improve the visitor experience.
  + **Reason:** To adapt technology to the specific needs of the zoo and ensure that the solution is viable and efficient.
* **Managing IT projects:**
  + **Application:** The implementation of the application requires effective project management, from planning to final delivery.
  + **Reason:** To coordinate the different teams involved, control deadlines and budget, and ensure that the project objectives are met.
* **Building data models:**
  + **Application:** A robust and scalable database needs to be designed to store information about animals, visitors, and the interactions between them.
  + **Reason:** To guarantee the integrity and consistency of the data, as well as facilitate the generation of reports and analysis.
* **Developing the transformation of large volumes of data:**
  + **Application:** As the application is used, large amounts of data will be generated that can be analyzed to obtain valuable insights into visitor behavior and the effectiveness of the application.
  + **Reason:** To make data-driven decisions to continuously improve the application and offer a more personalized experience to users.
* **Building the architectural model:**
  + **Application:** A solid and scalable architecture needs to be designed to support the application's functionalities and allow for future growth.
  + **Reason:** To ensure the stability and performance of the application in the long term.
* **Developing a software solution:**
  + **Application:** The creation of the application itself requires programming and software development skills.
  + **Reason:** To implement the functionalities defined in the design and ensure the quality of the code.
* **Programming queries and routines:**
  + **Application:** To extract information from the database and generate reports, it will be necessary to develop custom queries and routines.
  + **Reason:** To facilitate information management and report generation.
* **Building programs and routines:**
  + **Application:** The development of specific functionalities of the application, such as the collectible album system or the interactive map, will require the creation of programs and routines.
  + **Reason:** To implement the functionalities defined in the design.
* **Implementing systemic solutions:**
  + **Application:** The integration of the application with other zoo systems (e.g., the ticket sales system) requires a comprehensive view of the processes.
  + **Reason:** To optimize processes and improve operational efficiency.
* **Resolving systemic vulnerabilities:**
  + **Application:** The security of the application and user data is a priority.
  + **Reason:** To protect confidential information and comply with security regulations.

## Relationship of the project with my professional interests

This project aligns with my professional interests as I am inclined towards documentation, planning, and project management. My proficiency in documentation, schedule management, and handling concepts, both in traditional methodologies and within the Scrum framework, allows me to effectively record and plan projects. Examples within our project where project management is applied include:

**Project Initiation**

* **Scope definition:** Clearly establishing the functionalities of the application, the project's boundaries, and the expected outcomes.
* **Stakeholder identification:** Determining who is involved in the project (developers, designers, zoo team, visitors, etc.) and their expectations.
* **Creation of an initial project plan:** Developing a document that describes the project's objective, scope, deliverables, schedule, and required resources.

**Planning**

* **Work breakdown:** Dividing the project into smaller, more manageable tasks.
* **Resource estimation:** Calculating the time, budget, and human resources needed for each task.
* **Creation of a detailed schedule:** Establishing a calendar with start and end dates for each task, considering dependencies between them.
* **Risk management:** Identifying potential risks that could affect the project and developing contingency plans.

**Execution**

* **Progress tracking:** Regularly monitoring the project's progress and comparing current performance with the planned performance.
* **Team management:** Coordinating the activities of the different teams involved in the project.
* **Quality control:** Ensuring that deliverables meet established quality standards.
* **Communication:** Keeping all stakeholders informed about the project's progress.

**Monitoring and Control**

* **Deviation analysis:** Identifying differences between actual and planned performance and taking corrective actions if necessary.
* **Project plan update:** Adjusting the project plan according to changes that arise during execution.

**Project Closure**

* **Final delivery:** Delivering the final product to the client (in this case, the zoo team).
* **Project evaluation:** Evaluating the project's performance in terms of scope, time, cost, and quality.
* **Document archiving:** Documenting the lessons learned for future projects.

## Argument for the feasibility of the project within the course

**Project Management**

* **Planning and organization:** The ability to structure the project into phases, establish milestones, and define a detailed schedule is fundamental to ensuring project success.
* **Risk management:** Identifying and mitigating potential risks, such as development delays or changes in requirements, is a key skill to keep the project on track.
* **Team coordination:** Experience in managing multidisciplinary teams allows for effective collaboration between developers, designers, and other stakeholders.

**Software Development**

* **Requirements analysis:** The ability to understand the client's needs (in this case, the zoo) and translate them into functional requirements is essential for designing the application.
* **System design:** Knowledge of database design, software architecture, and the selection of appropriate technologies ensures a scalable and efficient solution.
* **Application development:** Programming experience allows for the implementation of the application's functionalities, such as the user interface, album system, and interactive map.

**Data Management**

* **Data modeling:** The ability to design data structures that represent information efficiently and accurately is fundamental for storing and retrieving data about animals and visitors.
* **Data analysis:** The ability to extract valuable information from collected data allows for informed decisions about improvements to the application and user experience.

**Communication**

* **Technical communication:** The ability to explain technical concepts clearly and concisely to a non-technical audience is crucial for interacting with the zoo team and other stakeholders.
* **Interpersonal communication:** The ability to work in a team and establish strong interpersonal relationships facilitates collaboration and conflict resolution.

**Other Relevant Skills**

* **Agile methodologies:** Knowledge of methodologies like Scrum allows for flexible adaptation to changes and incremental delivery of functionalities.
* **Best development practices:** The application of quality and security standards in software development ensures the reliability and maintainability of the application.

## Clear and coherent objectives

**General Objective**

* **English:** Enhance the visitor experience through technology, transforming a zoo visit into an educational and entertaining experience.

**Specific Objectives**

* Provide detailed and up-to-date information about each animal species in the zoo.
* Promote learning about biodiversity, conservation, and animal welfare.
* Awaken the curiosity and interest of visitors, especially the youngest ones.
* Increase visitor attraction to the zoo.

## Proposed Work Methodology to Achieve the Objectives

The Scrum methodology, with its iterative and incremental approach, is ideal for the development of a project like Buin Zoo. It allows for flexible adaptation to changes, rapid delivery of value, and high team involvement.

**Detailed Proposal**

**Roles and Responsibilities**

* **Product Owner:** Represents the zoo team, responsible for defining the product, prioritizing functionalities, and managing the backlog.
* **Scrum Master:** Facilitates the Scrum process, resolves impediments, and ensures the team follows Scrum practices.
* **Development Team:** Developers, designers, and other specialists responsible for building the application.

**Scrum Events**

* **Sprint Planning:**
  + Define the Sprint Goal.
  + Select user stories from the backlog to be developed in the Sprint.
  + Create a Sprint plan.
* **Daily Scrum:**
  + Daily 15-minute meeting to synchronize the team and review progress.
* **Sprint Review:**
  + Demonstrate the product increment to the Product Owner and stakeholders.
  + Gather feedback.
* **Sprint Retrospective:**
  + Reflect on the past Sprint to identify improvements.

**Scrum Artifacts**

* **Product Backlog:** Ordered list of all features and enhancements desired in the product.
* **Sprint Backlog:** Set of user stories selected for the Sprint.
* **Increment:** The functional product resulting from each Sprint.

**Scrum Practices**

* **Iterative and incremental development:** The product is developed in small increments, delivering value continuously.
* **Self-organizing teams:** The team organizes itself and makes decisions autonomously.
* **Continuous collaboration:** The team collaborates closely throughout the project.

**Specific Adaptations for the Project**

* **Definition of Done:** Establish clear acceptance criteria for each user story, ensuring work is complete and ready for delivery.
* **Backlog Refinement:** Regularly dedicate time to detail and prioritize user stories in the Product Backlog.
* **Frequent demos:** Regularly demonstrate the product under development to obtain early feedback.
* **Continuous integration:** Implement a continuous integration pipeline to automate testing and deployment.
* **Quality management:** Incorporate unit, integration, and user testing to ensure product quality.

**Benefits of Using Scrum:**

* **Flexibility:** Ability to adapt to changes and new project needs.
* **Transparency:** Visibility of project progress for all stakeholders.
* **Continuous improvement:** The team learns and improves constantly through retrospectives.
* **Higher customer satisfaction:** Frequent delivery of value and the ability to influence product development.

## Work Plan for the APT Project

**Phase 1: Initiation**

* **Team formation:** Assemble a multidisciplinary team with the necessary skills for project development (developers, designers, project managers).
* **Product Owner definition:** Designate the zoo team representative who will assume the role of Product Owner.
* **Creation of the initial backlog:** Develop an initial list of all the features and improvements desired in the application.
* **Definition of Sprint 0:** Dedicate an initial Sprint to setting up the development environment, defining coding conventions, and establishing work processes.

**Phase 2: Iterations (Sprints)**

* **Sprint Planning:**
  + Select the highest priority user stories from the backlog.
  + Estimate the effort required to complete each story.
  + Create a detailed Sprint plan.
* **Development:**
  + The team works collaboratively to develop the functionalities selected in the Sprint.
  + Daily scrums are held to synchronize work and resolve impediments.
* **Review:**
  + The product increment is presented to the Product Owner and the zoo team.
  + Feedback is collected and backlog priorities are adjusted.
* **Retrospective:**
  + The team reflects on the Sprint and identifies areas for improvement.
  + Actions are defined to improve the process in the next Sprint.

**Phase 3: Project Closure**

* **Final delivery:** Deliver the application to the zoo team, including the necessary documentation.
* **Project evaluation:** Conduct a final evaluation of the project, comparing the results obtained with the initial objectives.
* **Backlog closure:** Archive the backlog and document the lessons learned.

**Key Activities in Each Sprint**

* **User interface design:** Create an intuitive and attractive interface that facilitates navigation and interaction with the application.
* **Functionality development:** Implement the selected user stories, including the collectible album system, interactive map, and detailed information about species.
* **Data integration:** Connect the application to the zoo's databases to obtain up-to-date information about animals.
* **Testing:** Perform unit, integration, and user testing to ensure product quality.
* **Deployment:** Deploy the application to a production environment and make final adjustments.

**Tools**

* **Project management tool:** GitHub Kanban.
* **Version control tool:** Git and GitHub.
* **Collaboration tool:** Discord

## Proposal of evidence to demonstrate the achievement of activities

Evidence is fundamental to evaluating the success of any project. In the case of Buin Zoo, a set of indicators is proposed that allow measuring both the fulfillment of the stated objectives and the impact generated on the visitor experience. Through this evidence, it is possible to demonstrate the effectiveness of the application and its contribution to achieving the zoo's objectives.

**Process Evidence**

* **Backlog:** History of user stories, their status, and decisions made.
* **Product increments:** Functional versions of the application in each Sprint.
* **Sprint reports:** Summaries of each Sprint, including achievements, challenges, and lessons learned.
* **Development diaries:** Detailed records of the team's daily activities.
* **Source code:** The application's source code, versioned and stored in a repository.
* **Technical documentation:** Documentation of the application's architecture, design, and functionalities.

**Product Evidence**

* **Functional mobile application:** The final application, meeting all functional and non-functional requirements.
* **User manual:** A clear and concise document that explains how to use the application.
* **Database:** The database that stores information about animals, users, and interactions.
* **Tests:** Results of unit, integration, and user tests.

**Impact Evidence**

* **Usage statistics:** Number of downloads, average usage time, most visited sections.
* **Satisfaction survey:** User feedback on the application.
* **Data analysis:** Analysis of collected data to identify usage patterns and opportunities for improvement.
* **Impact on education:** Case studies demonstrating how the application has contributed to environmental education.
* **Impact on marketing:** Analysis of the application's impact on attracting visitors and on the zoo's image.

**Management Evidence**

* **Burndown charts:** Visualization of the team's progress in each Sprint.
* **Velocity reports:** Measurement of the team's ability to complete work.
* **Flowcharts:** Visual representation of work processes.

## **Conclusion**

The Buin Zoo project is shaping up to be an innovative initiative that will transform the visitor experience at the zoo. Through an interactive mobile application, we aim to provide detailed information about species, promote environmental education, and create a deeper connection between visitors and nature.

In the future, we expect:

* **Successful launch of the application:** The mobile app will be available to visitors by [estimated date], offering an immersive and educational experience.
* **Increased visitor satisfaction:** We expect the app to contribute to greater visitor satisfaction, reflected in an increase in positive evaluations and average visit time.
* **Strengthening of the zoo's brand:** The app will position Buin Zoo as a leader in innovation and environmental education.
* **Generation of valuable data:** The collection of usage data will allow us to analyze visitor behavior patterns and make evidence-based decisions to continuously improve the user experience.

The next steps include:

* **Completion of application development:** Complete the remaining functionalities and perform the necessary testing to ensure quality.
* **Implementation of a marketing campaign:** Design and execute a marketing campaign to inform visitors about the application and encourage its download.
* **Monitoring and evaluation:** Implement a monitoring system to measure the application's performance and make adjustments as needed.
* **Expansion of functionalities:** Explore new opportunities to expand the application's functionalities, such as integration with augmented reality or the creation of online communities for animal lovers.

## Reflection

The implementation of the Buin Zoo project represents a significant step towards the digital transformation of zoos and the adoption of new technologies to enrich the visitor experience. However, it is essential to reflect on the challenges and opportunities presented by such initiatives.

**Challenges:**

* **Technology integration:** Integrating diverse technologies, such as mobile app development, database management, and geolocation system implementation, can present technical and coordination challenges.
* **Constant updating:** The rapid advancement of technology requires constant updating of the application and adaptation to new trends and devices.
* **Information maintenance:** Maintaining up-to-date and accurate species information requires continuous effort and collaboration with experts in the field.
* **Visitor acceptance:** The adoption of new technologies by visitors may vary, requiring appropriate dissemination and training strategies.

**Opportunities:**

* **Personalized experience:** The application allows for a personalized visitor experience, offering recommendations based on their interests and preferences.
* **Environmental education:** The application becomes a powerful tool for environmental education, allowing visitors to learn interactively about species and their conservation.
* **Data generation:** Collecting application usage data allows analyzing visitor behavior patterns and making evidence-based decisions to continuously improve the user experience.
* **Collaboration with other institutions:** The application can serve as a platform for establishing collaborations with other educational and conservation institutions, expanding its reach and impact.

**Final Reflections**

The Buin Zoo project not only represents a technological innovation but also an opportunity to rethink the relationship between humans and nature. By combining technology and education, we aim to foster greater awareness of the importance of conservation and promote a change in attitude towards the environment.

However, it is essential to recognize that the success of such initiatives depends on a multidisciplinary approach involving experts in technology, education, conservation, and marketing. Additionally, it is necessary to have the support of the institution and visitors to ensure the long-term sustainability of the project.