**D424 – Software Capstone**

**Task 2**



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| **Capstone Proposal Project Name:** | Inventory Management System |
| **Student Name:** | Brady Boyd |

**Table of Contents**

*Create a professional looking Table of contents that includes your main and subheadings and the related page numbers. Use the automatic TOC generating function of Word or other word processing packages to make the process easier.*

*The headings that follow are only examples of what might be included. You will need to create headings that are appropriate for your application and process.*

***Remember that this needs to be a professionally formatted document with detailed information about your project that is easily accessible.***

# **Business Problem**

**The Customer**

The customer is PerfectPens, a producer of high-quality, mid-budget custom pens. The company is a small operation of around 20 employees, which consists of a design team, an engineer, executives, and assemblers. As a company that has been in business for over thirty years, PerfectPens still relies on manual inventory management via written ledgers. The current IT infrastructure is minimal and contains three office computers and a printer/copier; however, PerfectPens is highly committed to bringing its classic craftsmanship into the modern world. As such, the company’s short-term goal is to increase efficiency in inventory management, and its long-term goal is to translate increased efficiency, saved time, and improved processes into healthy expansion and a larger customer base.

## **Business Case**

Describe how the software application will help the client. This should include a thorough description of the current problem being faced. Then, explain how the application will function to solve that problem.

PerfectPens’ current reliance on manual inventory tracking with written ledgers has produced a system that experiences inaccuracies and inefficiencies. Mistakes in calculations, confusing ledger entries, and inconsistent methods across all employees have been forgivable in the company’s past, but as PerfectPens grows, the errors become more glaring, and the consequences of not updating to modern technology become increasingly more expensive.

To address these issues, a customized inventory management system will be developed that will transform the manual ledger into a digitized, automated, and accurate digital replacement. The application will provide real-time tracking of raw materials and finished products. By making this transition, PerfectPens will be able to reduce errors, save staff time, and improve overall efficiency, laying a solid foundation for further expansion.

## **Fulfillment**

To fulfill PerfectPens’ growing needs and to meet the company’s IT infrastructure where it currently lies, the inventory management system will be written in Java, utilize an H2 database, and be cloud-hosted on Amazon Web Services. This will enable access to the current office computers and any new equipment that can access the internet. Applications hosted on AWS are scalable with little effort and minimal changes to the application’s code. Users will be able to add, edit, and update inhouse and outsourced parts and finished products separately, and the inventory management dynamically adjusts the inventory counts and related information in all relevant spaces based on these user actions.

# **SDLC Methodology**

The SDLC methodology chosen for this project is Kanban, an Agile methodology. Kanban was chosen because the requirements are clearly defined and understood, and its iterative nature allows for swift adaptability and incorporation of changes. Also, Kanban’s principles of limiting work-in-progress and visualizing workflow help optimize efficiency and minimize distractions in a solo development environment such as the one presented. Despite the distance from PerfectPens, the frequent meetings and updates that the Kanban methodology helps to facilitate ensure that the current progress of the project is in alignment with the needs of PerfectPens.

The Kanban methodology will follow these phases:

1. Requirement Gathering: This phase involves in-depth conversations to understand the current state of PerfectPens and the requirements that should be met in order to satisfy its inventory management needs. These requirements are translated into user stories.
2. Design: This phase will comprise of analyzing the user stories and creating a design document composed of UML diagrams and a wireframe based on that analysis.
3. Development: The development phase consists of analyzing the user stories and using the SpringBoot framework to code in accordance with the requirements of the user stories and design phase.
4. Testing: At the completion of each feature, the feature is thoroughly tested to ensure there are no bugs and the features align with the requirements from the user stories..
5. Deployment: After each successful test, the feature or set of features will be deployed to AWS cloud, allowing the transition from a manual ledger to happen smoothly and gradually.
6. Maintenance: After the application is deployed, there will be periodical reviews at set intervals to assess the system for areas of improvement and updates.

Each phase is visually tracked using the Kanban board, which is the visual focus of the Kanban methodology that tracks the progress of each stage of development.

# **Deliverables**

The deliverables of the Kanban methodology can be categorized into two types:

## **Project Deliverables**

* Kanban Board
  + The central hub for project management that visually represents workflow. It is divided into columns labelled backlog, in progress, testing, and done. The Kanban board monitors the progress of each task with a visual indication in one of the four columns.
* User Stories
  + User Stories are generated from the analysis of the requirement gathering phase. These features are what help define the features and functionality of the application.
* Sprint Retrospectives
  + Because of Kanban’s continuous delivery nature, reports are regularly generated to document the progress of the inventory management system and what can be improved for the next development cycle.
* Technical Documentation
  + Throughout the stages of development, documentation will be created to document system architecture, code, and other technical details to serve as a reference for maintenance and updates.

## **Product Deliverables**

* Mockups
  + After assessing the user stories, a general non-functioning layout will be presented to PerfectPens for approval.
* Software Prototype
  + A barebone version of the application with basic functionality is delivered at this stage to serve as tangible progress. Suggestions for improvement from PerfectPens based on the prototype will ensure that the final product meets or exceeds PerfectPens’ needs.
* Final Software Product.
  + The fully-functioning inventory management system that satisfies PerfectPens’ growing needs will be delivered.
* User Manual
  + A detailed guide that provides instructions as to how to perform all the functions of the inventory management system, including adding, updating, or deleting parts, as well as how to assemble products from parts.
* Source Code
  + All of the code for the SpringBoot framework, database schema, HTML in the inventory management system.

# **Deployment Plan and Outcomes**

Explain how the project will be deployed. This has to do with how the software application will be put into the production environment, not how it will be created. So, consider the customer and timing required to meet its needs. When will validation and verification take place? What personnel will be part of the implementation and what roles will they serve?

Because the inventory management system is cloud-hosted with Amazon Web Services, no downtime is necessary, even when considering scalability and availability to accommodate future growth. All that is required is that the current office computers are able to access the Internet, making the transition from manual ledgers seamless.

The deployment process is as follows:

1. Validation and Verification: Rigorous testing, including unit, integration, and user acceptance testing, will be conducted before deployment to endure that the inventory management system functions as intended and meets the requirements ascertained from the user stories.
2. Deployment: After validation and verification, the application will be deployed using AWS Elastic Beanstalk. The developer handles this, and no action is needed from PerfectPens.
3. Training: The office manager of PerfectPens and the two employees will be trained on all the features and how the features interact with each other. This training will be conducted by the developer remotely over three days.
4. Support: After deployment and staff training, ongoing technical support is provided to resolve bugs and issues and answer any questions regarding the use or functionality of the inventory management system.

# **Project Timeline**

For this section, you'll need to look at the phases of the project and provide information about the time required to complete each phase.

For example:

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| Phase | Milestone/Task | Deliverable | Description | Dates |
| Pre-development | Task 1 | Requirements | Meeting with customer and procedure review | 6/1/2018 – 6/30/2018 |
| Design | Task 2 / Design files | Low fidelity wireframe  High fidelity mockup | Create the UI that relates the look and feel of the project | 7/1/2018 – 7/15/2018 |
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**C.  Justify the programming environments included in the development of the software product, including the following:**

**●  any related costs**

**●  the human resources that are necessary to execute each task**

**Removed the instructions in red and any other sample information before submitting.**

# **Environments and Costs**

## **Programming Environment**

Provide a clear picture of what hardware and software are required to complete the project.

For example:

* Windows 2016 Server running IIS 7.5 or higher
* Microsoft SQL Server 2012 or higher
* …etc..

## **Environment Costs**

Provide an explanation of the costs associated with the software application. Some might be startup, first-time costs while others might be a percentage of licensing costs. Environment costs are relatively minimal. The environment where the system resides in a shared environment where costs are shared by the organizations. There is a nominal fee associated with maintaining the database of $500 a year that allows for unlimited storage size and 99.8% uptime. The web server is another fee of $300 a year that includes maintenance and upgrades of the following; Windows Server, IIS, and ColdFusion. The final cost is based on the thick or thin clients utilized by the customer. Each device that is attached to the network has a $40 annual fee which covers Operating System and Network upgrades.

## **Human Resource Requirements**

What is the time and cost for the labor to complete the application?

For example: The larger share of human resource is by the developers of the project followed by the PM. Developers consume approximately 75% of the hours and dollars associated with …etc.

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*D.  Explain how the proposed software product will be tested by doing the following:*

*1.  Justify the methods for validating and verifying that the developed software product will meet customer needs.*

*2.  Explain how your test results will be analyzed.*

# **Validation and Verification**

Describe the methods that you'll use to prove that the software application functions sufficiently well to meet the customer's needs. Does it provide all the functionality required? How will those tests be performed and by whom? Identify how segments of the code will be tested. The Customer will perform Acceptance Testing prior to taking ownership of the application.

For example:

Testing will be a comprehensive full lifecycle test to ensure that the application has met the requirements as designed. The customer will complete multiple testing sessions with multiple users…etc..

E.  Acknowledge sources, using in-text citations and references, for content that is quoted, paraphrased, or summarized. Only include if needed. This is a proposal; you are providing information about your application. There is no real need for additional references. You are the subject matter expert of your project.

F.  Demonstrate professional communication in the content and presentation of your submission. Use Grammarly.com and a good proofreading before submitting.