Software Requirements Specification and Technology Neutral Process Design

(Name of System)

University of Pretoria - Team Charlie

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1 Introduction

1.1 Purpose

The purpose of this document is to give a detailed explanation and description of the [Name] system. This document will illustrate the purpose as well as the features of said system, the interfaces of the system, the functionality of the system, the constraints under which it must operate and how the system will integrate with external systems. This document has been created for use by the developers of the system, the proposed client as well as any other additional third party collaborators who require to understand the software specifications of the [Name] system.

2   Vision

The client has requested a system which allows researchers at the *University of Pretoria*, specifically within the Computer Science Department, to keep track of the publications which they are currently actively involved with or working on.

The system is required to keep track of historical publications so as to allow researches to maintain an archive of their work.

The system should support the management of the multiple research groups within the department as well as allow the acting heads of the individual research groups to manage their group's members and publications.

Ultimately this system is to be used by the acting Head of Department so as to be able to view all the research groups and their research output. It is a way for the department to ensure that the researchers are meeting their goals as well as the department's goals so as to ensure future funding for the department.

The typical usage scenarios for the desired output from this system would be:

- A UP staff member submitting a research paper to a conference, technical report or conference.

- The submission and acceptance of such a paper is what allows researchers to earn units.

- These units correspond with academic prestige as well as funding for the University of Pretoria and its researchers.

- Departments have predetermined goals which they set out to achieve each academic year.

- The ultimate desired output from this system is the ability to monitor the CS Department's researchers and their contribution towards earning these units.

- This allows the acting Head of Department to award researchers who achieve as well as take note of those who do not.

3   Background

Reasons for the development of this project include but are not limited to:

- Research opportunities:

  - Through the monitoring of units earned by staff members it enables the progression of research opportunities for the *University of Pretoria's* Computer Science Department. By monitoring units earned the department is able to ensure that it meets its goals and is able to secure funding opportunities.

- Opportunities to simplify some aspect of work:

  - The method in use by the department currently is to have all researchers edit the same Microsoft Excel document as their manner of managing and tracking publications and units earned.
  - This method is inefficient as well as error prone and has hence lead to the need to create this system as a means to replace it.
  - This system aims to allow for all researchers to be able to manage their own publications in their own user space. It also allows for the Head of Department to no longer have to use an Excel document to create reports from, instead he/she would be able to use the system to the work for him/her in a far more accurate and efficient manner.

- Problems the client is currently facing:

  - The problem of having all members of a department trying to collaborate on a single Excel document.
  - The problem of having personal and academic information visible to all who have access to this document.
  - The problem of managing this data in such a way as to get valuable and meaningful information out of it quickly and accurately.

4   Architecture Requirements

4.1   Access Channel Requirements

The different access channels through which the system's services will be made available to users as well as other systems are as follows:

- An Application Program Interface residing on a server which will be interfaced with by clients in order to supply services to them. Clients referring to:
  - Human users via an interface
  - External systems using the services provided by the API

- Human users can interface with the system via the use of:
  - a web-based application service
  - an android based mobile application

The interface is required to be lightweight.

4.2   Quality Requirements

- Performance

  - Workload is a maximum of 100 users concurrently.
  - No implementation of concurrent editing of document entries - last saved edit is written to the database.
  - The system should be able to support 100 users updating information at the same time as updating is more intensive than reading.
  - The response time of the system should be fast enough that a user is able to complete their work without frustration. Due to the system being off-line it is reasonable to expect the system's response time to be only limited by the speed of the network.

- Reliability

  - The system should not fail whilst providing critical or important use cases.
  - The system should not fail at all within a time period of at least 6 months.

- Scalability

  - Ability for multiple external systems to connect to the system's API.
  - The system should be able to support a large amount of historical document entries being added to the database.

- Security

  - A hierarchical system will be used to determine the security privileges of users of the system.
  - Passwords are to be hashed using at least sha256 and should be stored as such within the database along with a salt.
  - An inactive user session should be terminated after a period of 10 minutes with no activity.
  - A user who has forgotten their passwords can use a password reset option which will send a one time password to their registered email address so that they may login once using it and reset their password.

- Flexibility

    - The client has stated that the system is not needed to be able to extend to accommodate a greater number of departments.

- Maintainability

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- Auditability/monitorability

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- Integrability

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- Cost

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- Usability

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4.3 Integration Requirements

- The first item
- The second item
- The third etc . . .

4.4 Architecture Constraints

- The first item
- The second item
- The third etc . . .

5 Functional Requirements and Application Design

5.1 Use Case Prioritization

Critical: The first item

Important: The second item

Nice-to-Have: The third etc . . .

5.2 Use Case/ Service Contracts

Pre-conditions: The first item

Post-conditions: The second item

Request and Results Data structures: The third etc . . .

5.3 Required Functionality

5.4 Process Specifications

5.5 Domain Model

6   Open Issues

- The first item

- The second item

- The third etc . . .