Software Requirements Specification

for

Research Higher Degree (RHD) Applications Database

Version 1.0

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Created as part of the requirements for Advanced Database

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Revision History

Name	Date	Reason For Changes	Version

1. Introduction

1.1 Purpose

The purpose of this document is to introduce and specify the requirements of a new software database ("the database product").

The database product will constitute only part of a larger human-computer software system responsible for developing Research Higher Degree (RHD) applications. The database is to assist staff of the School of Computer Science, Engineering and Mathematics (CSEM) of Flinders University in pursuing this task.

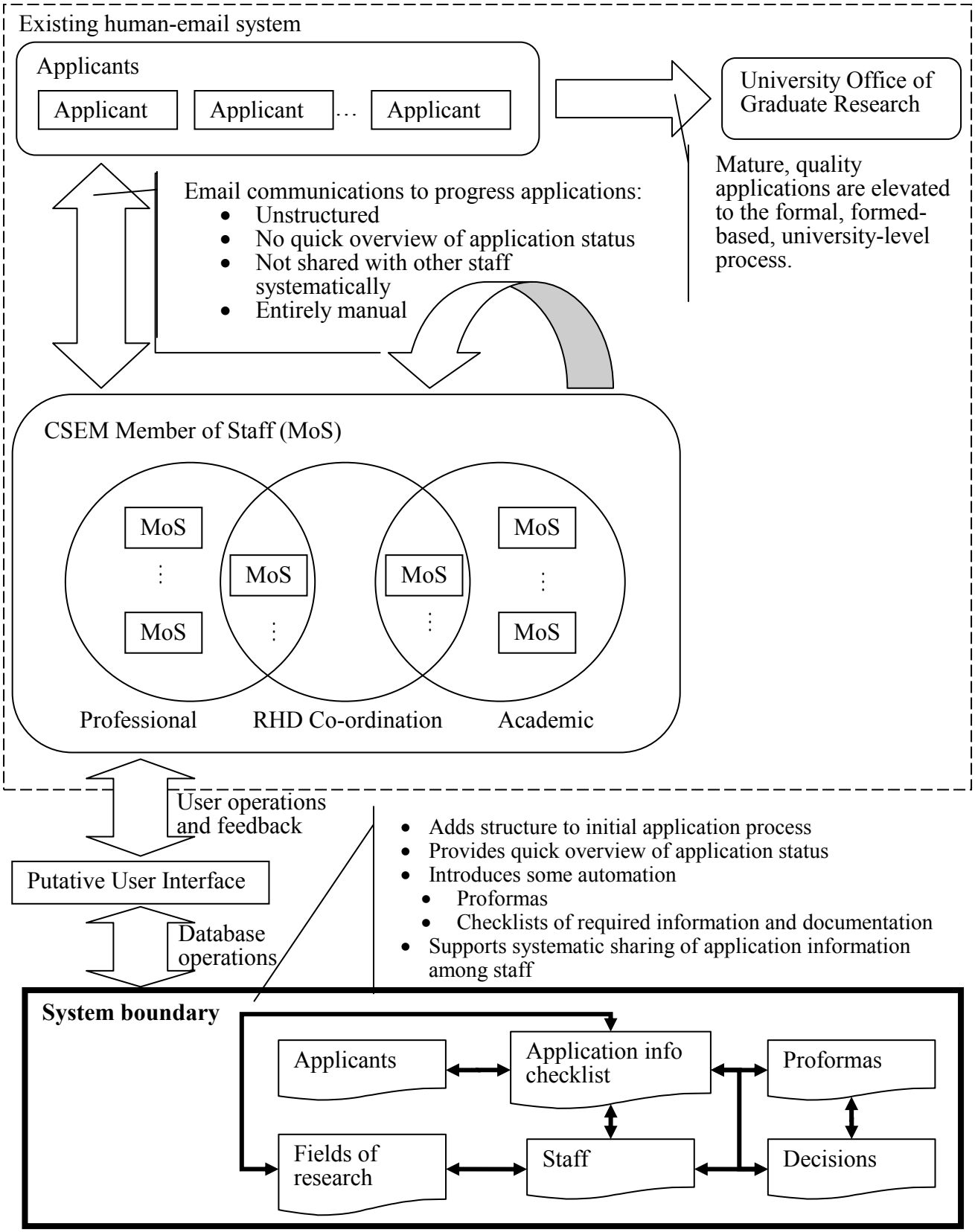
1.2 Document Conventions

Throughout this document the terms 'product' and 'database' are used interchangeably as the product consists solely of a single database.
Requirements can be inherited and composed or be aggregates of other requirements.
Abbreviations will be used with definitions available in an appended glossary at the end of the document.

1.3 Intended Audience and Reading Suggestions

This document is intended to be read by Developers, RHD office staff members and CSEM faculty staff. Developers and RHD Staff Members are suggested to read this document in its entirety in the form presented herein. CSEM staff should read the mission statement, product features, product perspective and the specific system requirements to gain a simpler overview of the proposed product.

Figure 1: Project Scope Diagram. The new database software product shown in context of the wider human-computer RHD application system



1.4 Project Scope

The mission statement for this project is:

> *To support CSEM staff working together to quickly select and guide high-quality Research Higher Degree applications from initial, direct, informal contact to the formal university RHD application process.*

The project is limited to the creation of a usable full functional database that can be accessed through the command line. No Graphical User interface GUI, will be required for this stage of development. The main benefit of the product is to provide a place to store the core details of an application in an easily viewable and editable form that will enable application and applicant data tracking over the evaluation of one or more applications. This database will give staff a greater understanding of prospective students allowing the strengths of the university and future student to be combined whilst continuing the expansion of the CSEM faculty as outlined by the CSEM mission statement. In the short term the system will improve the quality of application screening and positioning.

We are always on the lookout for qualified and enthusiastic students who are interested in joining our research teams in extending the knowledge of the science and the practice of the discipline

1.5 Fact Finding Techniques

The requirements will be gathered through documented information received from the Research Higher Degree Admissions officer as well attained through follow up meetings and via FLO discussion boards to clarify any issues or attain more detailed information on some areas.
This is anticipated that there will be an opportunity for the users/customers to refine their understanding of the requirements as more implementation ideas and details are presented to them by our group and others. The users/customers in this case are Associate Professor Paul Calder as the Director of Higher Research Degree Studies in CSEM and Dr Denise de Vries as a member of staff who responds to many unsolicited enquiries about HRD.

The Flinders University Office of Graduate Research accepts form-based applications (Flinders University Office of Graduate Research 2014) that all successful HRD applicants have to go through. The requirements of this existing system can be used to help define the checklist of documents and other outputs of our new system.

This system will have to store information about areas of research. There is an existing scheme in use in academia in Australia called the Field of Research codes (Australian Bureau of Statistics 2014). Flinders University staff web pages contain examples of how academics describe their research interests. The Flinder's University "Find a Supervisor" website (Flinders University Office of Graduate Research 2014) demonstrates how areas of research can be mapped to potential academic supervisors.

The CSEM school website shows the list of RHD awards they run.

An applicant's Grade Point Average (GPA) is crucial for making decisions about the viability of their application. A complexity here is that GPA is calculated in different ways between national tertiary education systems and even between different compatriot institutions. We need to support automatic standardisation of applicant's GPA scores in our system to simplify the process of taken

decisions about the viability of applications. Thus we need to build in a level of awareness of the scoring systems. Wikipedia has a detailed page about GPA scoring in Australia (Wikipedia 2014) and an overview of systems in many other nations (Wikipedia 2014). All particular information contained on these pages will need to be confirmed directly with different institutions, but these pages give a good overview of the diversity of scoring systems, which we can use to inform the scope of this aspect of our database.

2. Overall Description

2.1 Product Perspective

This database system is a novel product. Email is currently the only tool that is used to help perform RHD management; however it does not provide any help specific to this purpose. The new product will be specifically designed to the task of managing RHD applications and will provide assistance where possible to aid in this task.

However, the new product won't replace or constrain email communications. Rather, the system will support CSEM staff in managing RHD applications, and make the mail communications quicker to write and easier to keep track of.

There is a form-based application process run by Flinders University Office of Graduate Research. This constitutes a second phase of the application process, which each successful applicant must go through. A goal of our system is then to help CSEM staff make applicants aware of and be well prepared for the requirements of this subsequent, form-based, formal application process. We use the term 'elevate' to describe transitioning a promising application from being managed within our database to using the form-based, formal application process.

2.2 Product Features

To create a Database university staff use to track RHD applications at an early stage, i.e. before the applications are managed by the more formalised form-based system run by the Office of Graduate Research. The project is limited to the creation of a usable full functional database that can be accessed through the command line. No Graphical User interface GUI, will be required for this stage of development. However initial requirements are hinting towards an integrated add-on to existing email clients (e.g. Microsoft Outlook).

2.3 User Classes and Characteristics

The user classes for this system are CSEM Professional Staff, CSEM Academic Staff, and CSEM RHD Co-ordination Staff. Note that members of the CSEM RHD Co-ordination Staff are all also ether Professional or Academic Staff.

A common characteristic shared by all staff members is that they don't have a lot of time available to help develop RHD applications. Thus it's critical that the database product provide the ability to quickly get a picture of an application's status, and prompts of how best to progress the application from that point.

Another possible user class could be those Academic Staff who have expressed an interest in supervising an applicant's project. However, as we expect there will be frequent, perhaps even

ambiguous, shifts into and out of this user class, and we don't want to create a lot of work for users to have to update this information continuously, we chose not to distinguish this class in terms of their feature requirements.

Another possible user class could be the Applicants themselves. We can see clear benefits if the applicant were able to access their application directly, as they would be able to add any outstanding information themselves directly. This would avoid the requirement of emailing questions and information to staff members. However, for the purposes of this initial stage of development we won't consider the applicants as a user of this system. We leave that to a subsequent iteration of this system's development.

2.4 Operating Environment

The database itself will run on a server within the CSEMs IT department. Since the Server is not expected to be used heavily (on the order of a 200 or so transactions and simple queries per day) it is not expected that any new hardware will be required. The product will be built as a MySQL database which is freely available to all enterprises so there will be no additional cost for the database software itself.

2.5 Design and Implementation Constraints

The product will conform to standard MySQL core packages to enable greater update and management flexibility. Some security precautions will be taken to ensure that the data is not available to students and staff from other faculties.

2.6 User Documentation

Conceptual, logical and physical diagrams of the database will be delivered along with instructions on maintaining the database will be delivered with the product in the form of a PDF or E-Manual.

2.7 Assumptions and Dependencies

It is assumed that all users and the database itself have read/write access to a common file system area, for the purpose of linking documents such as PDFs or image scans to applications.

An associated front end application for users to interface with database has not yet been designed. It is expected that once it has been analysed and requirements gathered then small modifications to the database are expected to be made, predominately in the form of new queries.

3. Specific System Requirements

Here we list the functional requirements for each group of users. It should be noted that the database will be designed in such a way as to make these user functions easily achieved through a user interface, which is not yet designed. The database won't be able to support these features directly in a way suitable for normal users; only expert users would be expected to be able to drive the database to achieve the functions.

3.1 Professional Staff Functional Requirements

1. Create a new applicant record (broken down into smaller requirements)
    - An applicant will include the following, which also constitutes a checklist of information that applications will need to satisfy over time
        - Version ID
        - Each version will contain:

1.1 Basic details

- Full name
    - First name
    - Middle names
    - Last name
- Date of birth
- Sex
- Flinders University student ID if applicable
- Address
    - Country
    - State
    - Suburb
    - Postcode
    - Street and number
- contact details
    - email
    - home phone (including country and areas codes)
    - mobile phone (including country and areas codes)
- GPA
    - standardized or at least fully described

1.2 history

- most current CV
    - includes the Date of upload
- Publications
    - Name of publication
    - Issue number
    - Issue date
    - Online link (if available)
    - Upload (if rights are ok)
    - Associate authors
- Degrees completed
    - Degree title
    - Undergrad/postgrad
    - If postgrad is RHD
    - Institution
        - Name
        - country
    - year commenced
    - year completed

1.3 citizenship details

- Australian or New Zealand citizen or permanent resident;
- Visa details (if none of the above is the case)
    - Country of origin of visa application
    - Visa status
    - passport scan attached
- year of entry into Australia if applicable

1.4 English language proficiency
- IELTS/TOEFL
- main language spoken at home

1.5 Referees > 2
- Name,
- position,
- phone number
- email address
- academic link (linked-in / University webpage)

1.6 Record meta-data
- Name of staff member who created the record
- Timestamp of record creation

2. Create a new application record
    - Includes create applicant if does not exist
    - An application will include the following
        - Version number
        - Areas of research, for each
            - A list of Field of Research codes
            - A list of user-defined keywords
        - award sought (MSc, PhD etc)
            - Doctor of Philosophy, Master of Engineering, Master of Science (Computer Science), Master of Science (Mathematics).
        - research proposal summary (~100 words)
        - research proposal extended (~500 words)
        - proposed date of commencement
        - part-time/full-time
        - internal/external
        - proposed supervisors
            - telephone (from staff page, unique-ish ID)
            - name
            - position
        - proposed funding method
            - scholarship
            - financial guarantee
3. Use a proforma to generate standard correspondence
    - E.g. acknowledgments of receipt, requests for more information from checklist, etc.
4. Add records of correspondence concerning the application
    - E.g. acknowledgment of receipt, requests for more information from checklist, etc
    - Date of correspondence
    - To
    - From
    - Optionally attach document or image files
    - comments
5. Attach documents to an application. This includes adding descriptions of the document contents, including creating links to entries in the checklist that the document provides.
6. Delete an application
7. Delete an applicant
8. Delete a correspondent entry
9. View an application
    - Retrieve documents associated with applications
    - Most current version (but with links to previous versions)
10. View an applicant
    - Includes the display of associated applications
11. View application versions

12. View application changes
13. Search applications
14. Search applicants
15. Edit application (add new version - if significant change?)
16. Edit applicant (as hard copy changes)
17. Automatic generation of outbound correspondences (acknowledgement/RFI) appropriate to a particular applicant
18. View a checklist of the recorded and outstanding information require of an application
    - Entries not completed in the applicant, application includes requirement
    - All information in the checklist can be described with:
        - A status: unknown/unstated, stated, official document image provided in LOTE, or
        - Finalized
        - And a translation status
            - official document image provided in English, or
            - approved translation of official document provided
19. All applications will have a status object
    - That will contain
        - Current RHD staff supervisor
        - Previous staff supervisor
        - Is awaiting information (yes/no – info in correspondence)
        - Specific Application Status
            - Specific Status is
                - Terminated/Rejected – application is canceled
                - Unfinished – the application is unfinished
                - Proposed – the application is finished and proposed
                - Flagged – staff have flagged as interested
                - Partially assigned – some staff have agreed to supervise
                - Assigned – staff have agreed to supervise
                - Formal pending – all details are in order, formal process starts
                - Approved – formal application is approved
        - Decisions made
            - Made by
            - Conclusion reached
            - Comment
            - Date made
20. On an application status, flagged staff members are notified
21. The decision process will determine the applications status, application status starts at unfinished. Progress through the following decisions:

Question	**Decision**	**action – Application status**
Has the application been submitted	Yes	If unfinished change to Proposed
	No	(keep current status)
Have some staff flagged (0 to less than two)	Yes	If proposed change to Flagged
	No	(keep current status)
Is this an application worth pursuing (maybe no flags, no potential supervisors over six months)?	Yes	(keep current status)
	No	Terminated

Has one supervisor?	Yes	If Flagged/proposed change to partially assigned
	No	(keep current status)
There are two supervisors?	Yes	If Flagged/proposed/ partially assigned change to Assigned
	No	(keep current status)
Is application flagged and or has one supervisor and is aimed to commence in less than 2 months	Yes	Inform flaggees the application is about to expire
	No	(keep current status)
If requested additional information, how long has the applicant not responded to requests	>1 month	(keep current status)
	1 month	Send reminder
If requested additional information, how long has the applicant not responded to requests Has the applicant provided all the information we require?	3 months	Send reminder
	6 months	Terminate application
	Yes	Change application status to Start formal pending. Send email to being RHD Research formal application
	No	Issue request for information (from proforma, add correspondence entry, Set information requested to true)
Has enough information been presented to start a formal application?	Yes	Start formal application
	No	(keep current status)
Has the formal application been completed?	Yes	Mark application as approved, send confirmation email + official letter
	No	(keep current status)

The decisions that are still required are:

- What constitutes a minimal form that can be proposed (up for flagging and potential supervisors?)
- The leeway between proposed start date and when the application is to be rejected/

Data types:

- All data stored in the database will be hyperlinks, varChars, integers, Booleans, dates and SmallText
- The exact types each data will have will be detailed in the conceptual, logical and physical diagrams.

- The database will have to maintain links to attached document files, e.g. PDF and image files.

3.2 Academic Staff Functional requirements

1. Inherits all the functional requirements of the Professional Staff view
2. Academic staff will be able to flag applications as interested, including a link between staff and application
3. Academic staff will be able to flag applicants as interested, including a link between staff and application
4. Each academic member of staff may store information about fields of research they may be interested in supervising
   4.1. A list of Field of Research codes
   4.2. A list of user-defined keywords
5. Generate a report of summary of all applications with matching fields of research
   5.1. Optionally filtered to only new applications since a specified date
6. Receive notifications of new applications that have matching research field keywords.

3.3 RHD Co-ordination Staff Functional Requirements

1. Inherit all the functions of the Professional and Academic Staff views
2. Report statistics on the number of applications being actively managed and their status
3. Report statistics on the speed of processing RHD applications, to help decide if the system is meeting performance requirements

4. External Interface Requirements

4.1 User Interfaces

For the scope of this software database product, specific requirements for the user side of any user interface won't be considered.

However, the database will contain tables, views, stored queries and data examples that would be appropriate to drive the information content for an appropriate UI, given the feature requirements specified above. This will be demonstrable through direct database operations, expressed in SQL statements and responses.

4.2 Software Interfaces

This product will be delivered as a standalone software system. However it is expected that a front end application will be developed to interface with the database in future.

4.3 Communications Interfaces

The connection interfaces are expected to be determined by the server on which the database resides in addition to the MySQL servers own settings. These will be determined once further information about the rollout of the database is realised.

5. Other Nonfunctional Requirements

5.1 Initial database size

There is only a need to record currently active applications, not to initially load up the database with the history of completed applications. Hence, in this case the rate of growth is far more important than the initial size.

5.2 Database rate of growth

There are 40 members of CSEM staff and most would be contacted by 20-40 potential applicants during peak periods. Of these, at least one third would be immediately judged unsuitable and never be recorded in our system.

5.3 Types and average number of record searches

Most frequent searches are expected to be recalling applications that have been worked on recently. This may be run 100 times per weekday. The next most frequent search would be searching for applications given matching Field of Research codes. This may be run 30 times per weekday. And the last significantly frequent search is searching for applicant record for record by applicant name.

5.4 Networking and shared access requirements

We need to support at least 10 staff using the application simultaneously.

5.5 Performance

All searches, single record inserts and single record updates should return within one second.

5.6 Security

Access to only the information a staff member requires to do their job will be allowed. Views will be used to restrict operations available to certain users and groups of users. We are also assuming that all users have undergone training in professional integrity, so, it is expected there will not be any misuse of the product

5.7 Backup and recovery

The database should be backed-up by standard CSEM IT department infrastructure every week night. Recovery procedures should be tested every three months to ensure they can be relied upon.

5.8 Legal issues

Of primary concern here is applicant privacy, due to the collation of personal information. Access will have to be logged and shown to always be in the course of work duties.

5.9 Software Quality Attributes

Currently there are no specific quality attributes the software hopes to achieve. These general quality attributes will be dictated by the underlying MySQL server

6. Bibliography

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Appendix A: Glossary

RHD – Research Higher Degree
CSEM – School of Computing, Science, Engineering and Mathematics
FoR – Field of Research (code)
GPA – Grade point average