

CPMEC Feasibility Study on the Development of a Database and App for the Australian Curriculum Framework for Junior Doctors (ACF)

Feasibility Study Report – Executive Summary

Report Prepared by **Intelligent Software and Systems**



Activity **Web Application**

1.1. Activity details

ID [Retrieve activity details](#)

Activity / Procedure

Date (2 weeks)

Time hh:mm (24 hour)

1.2.

ACF Capability [Delete](#)

Search [Select: ACF Capability](#)

Add selection

- ▶ **Clinical Management**
 - ▶ Patient Assessment
 - ▶ Safe Patient Care
 - ▶ Systems
 - Works in ways which acknowledge the c
 - Uses mechanisms that minimise error e.
 - Participates in continuous quality improv
 - ▶ Risk & prevention
 - Identifies the main sources of error & ris
 - Recognises & acts on personal factors w
 - Explains & reports potential risks to pati
 - ▶ Adverse events & near misses
 - ▶ Public health
 - ▶ Infection control
 - ▶ Radiation safety
 - ▶ Medication safety
 - ▶ Acute & Emergency care
 - ▶ Patient Management
 - ▶ Skills & Procedures
- ▶ Communication
- ▶ Professionalism
- ▶ Procedural Skills
- ▶ Clinical Symptoms, Problems & Conditions

iPhone App

Android App

Carrier 2:57 PM

ACF App and Database

Activity

things

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ACF Capability Search ACF

Clinical Management

- ▶ Patient identification
- ▶ History and Examination
 - Recognises how patients pre
 - Undertakes a comprehensiv
 - Performs a comprehensive e
 - Elicits symptoms and signs
- ▶ Problem formulation
- ▶ Investigations
- ▶ Referral and consultation

Description

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1. Report Contents

The Feasibility Study Report contains these chapters:

- **Executive Summary, Introduction and Background:** A summary of the Feasibility Study, its background and major recommendations.
- **ACF App and Database Requirements:** A detailed description of the Requirements of the ACF App and database system.
- **ACF App and Database Project Plan and Project Schedule:** A detailed description of how the development and deployment of the ACF App and Database system could proceed, including its costs and the activities involved.

Terminology

The following terminology is used throughout this document.

App(s)	An executable application installed on a user's mobile device, such as an iPhone or Android smartphone. Also referred to as native device Apps.
Application	The web based application and Apps, collectively.
Associate User	A user with restricted access to a Trainee User's account, allowing read access and write access to assessment and related fields.
Native Device	A mobile phone, smartphone or tablet. (E.g. an iPhone or iPad).
System	Refers to the entire IT system for the ACF App and database. Major system components include the web server, the web application and the native device Apps.
Terms Of Use Agreement (TOU)	An agreement presented to the user prior to their registration and access to the system, which they must agree to before they can create an account. The TOU specifies the conditions of use of the system and indicates user and provider responsibilities.
Trainee User	A user of the system that is a trainee, i.e. PGY1 or PGY2.
Web Application	The user interface of the system accessible from a web browser.
Web Server	Server software that provides the content of all web pages for the web application and the Apps

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Executive Summary

2. Executive Summary

The Australian Curriculum Framework for Junior Doctors (ACF) was developed in 2006 and since then has become the preeminent guide to prevocational training in Australia. Whilst CPMEC has evidence of uptake by medical education units via accreditation processes, they have not previously had an ability to measure engagement with the ACF by individual prevocational doctors. As such, CPMEC commissioned a Feasibility Study to define the requirements and scope of an online ACF App and database system for use by trainees. This system would have the potential to assist individual junior doctors to engage with the ACF by mapping their clinical experience against the ACF capabilities in order to clearly identify individual term experiences and to identify gaps in their learning. In addition, CPMEC would have an ongoing database of clinical experience against the ACF which would assist them in providing education programs to address these learning gaps and ensure that the ACF was kept clinically relevant for prevocational doctors into the future.

The Feasibility Study was conducted by Intelligent Software and Systems (Intelsoft) and sought input from a variety of stakeholders: trainees (via a representative workshop and survey), an IT Steering Group and the System Beneficiaries Group. The information provided has been drafted by the consultant and presented to the stakeholders for feedback. The feedback has then been used to frame this final Report and its recommendations.

The Feasibility Study has determined that development of the system is feasible. In addition, the study has found that such a system would meet a currently unmet need within the trainee user group as well as encourage and promote use of the ACF amongst trainees.

Detailed consultation and analysis has supported definition of the requirements and scope of the system. The system recommended comprises a web application (accessed via a web browser) and native device Apps for iPhone and Android (all with equivalent functionality), supported by a central web server. The web server will also control all access to a central database that will securely store all information entered.

The requirement definition includes:

- clarification of the functionality that will be of use to trainees and
- definition of the infrastructure needed to support the ongoing use of the system.

The Project Plan describes a schedule of works which would result in the effective, timely deployment and ongoing support of the system. It includes:

- Timing, duration and dependencies between development activities.
- Resources required to carry out the development.
- Costs of development and optional activities.
- Assessment of potential risks and mitigation strategies for these.

Requirements Summary

Functionality has been proposed which allows both input of clinical experiences against ACF capabilities, validation of this experience by external sources such as supervisors and reporting functions to allow comparison of data for example across Australia.

It was decided that in order to test the system and develop a clearer understanding of user requirements, and due to funding constraints, it would be easier to deploy the system in stages. Three Stages have been recommended, with additional functionality being introduced at each Stage.

Stage 1 focuses on the individual trainee and encouraging them to record their experiences against the ACF capabilities in an easy, quick way to facilitate uptake. Stage 2 sees expansion of data recording capability and input from term supervisors to validate clinical activities and/or provide trainee feedback. The final stage, Stage 3, would allow linking with postgraduate college requirements to assist in college applications and integration with this next phase of training.

Trainee Functional Requirements

The key system functions that users will experience are summarised below. A complete list of all functions is included in the Requirements section of the Report.

Feedback and evaluation of the system at each Stage will be used to further refine the functions developed in each subsequent Stage.

Stage 1

The initial deployment of the system will allow trainees to record a summary of their training activities against an ACF capability and to indicate some of the relevant details of the activity.

An emphasis will be placed on making the user interface quick and easy to use. Where possible trainees will be provided with 'pull down' menus to facilitate data input (known as Structured Input). A range of useful reporting functions will also be provided, allowing users to make use of the information entered.

Ability to log activities against college portfolio requirements
Ability to attach additional files/documentation to activities (e.g. certificates of attendance)
Ability to log activities against ACF capabilities
Ability to confirm date and time (default to current)
Quick Add Function: Brief summary of activities (3 or 4 words)
Ability to include longer descriptions of certain activities, where user indicates.
Ability to mark activities as exemplars of the activity (i.e. significant example of the activity)
Ability to access a navigable version of the ACF
Ability to create logbook entries for ACF Skills and Procedures
ACF Competency and Capability auto-suggestion
ACF content management and update functionality
Term details automatically recorded against activities
Ability to record term details (e.g. speciality, supervisor, dates and other details)
College portfolio specific reports containing college specific datasets
CV Reports

Ability to generate reports in general
--

Stage 2

The second system deployment (Stage 2) will expand the amount of information that can be recorded by trainees, provide additional reporting options and increase the extent to which activities can be validated.

Ability to record learning goals against each term
--

Ability to initiate an activity record via taking/upload of image, for later description (e.g. image of an operation report)
--

Ability to assign supervisor's role (e.g. how closely were you supervised - independent vs. observed vs. available via the phone)

Ability to assign tags to the image

ACF Competency and Capability auto-suggestion (extended)
--

Ability to customise reports, which can then be printed and emailed

Ability to create learning plans (A learning plan indicates which ACF capabilities a junior doctor has had little or no exposure to)
--

Stage 3

Deployment of Stage 3 will include potential integration with external IT systems for validation of user identity, expanded multi-source feedback provision and expanded ACF capability and linkage suggestion.

ACF Competency and Capability auto-suggestion

ACF content management and update functionality

User profile verification against external sources (e.g. employers, colleges and regulating agencies)

Ability to allow supervisor validation of activities
--

Enabling recording of multi-source feedback, such as team members, other clinicians, peers and patients

Portal Functionality (extended)

System Infrastructure and Support Requirements

The system will require a set of infrastructure for its ongoing use. A set of recommendations for the system's development and ongoing maintenance have been made in the Report.

These are detailed in the Report and a summary is presented below.

Target Platform

The recommended target user platforms are iPhone and Android devices and web application supported with a modern web browser (IE8 and above).

Security

System security is required to balance two principles: (1) provide a sufficient level of security to reasonably prevent unauthorized access and (2) provide easy and practical user access to the system. The security recommendations try to find a balance between these, recognising the privacy

and confidentiality principles already in practice in hospitals, which trainees are expected to comply with.

Key recommendations include:

- User accounts will be initiated through self-registration.
- Individual users will be required to login with a username and password.
- Industry standard encryption, communication protocols and server management will be used.

Development of a Terms Of Use Agreement that indicates user responsibilities will also be required.

Hosting

It is recommended that the server infrastructure required be provided as virtual servers through a third party data centre. Australian hosting is also recommended.

Operational Structure

Operation of the system will require Development, ongoing Maintenance and Support and Help Desk Support. It is recommended that these services be outsourced to a service provider.

It is also recommended that the services be underpinned by a Service Level Agreement reflecting that while the system is not mission critical, its performance will have an impact on CPMEC reputation. As such, business hours support will be sufficient.

Additional Recommendations

In addition to the above, recommendations regarding the following are included in the Report: System Capacity, System Activity Logging, Interoperability, System Architecture, Backup, Archiving, Disaster Recovery and the Development Platform.

Project Schedule and Cost Summary

The project schedule has tentatively suggested a start date of 1 December 2014. The schedule of activities and their approximate costs is indicated in the schedule below.

Project Stage	Start Date	Cost estimate
Project commencement	December 2014	
Stage 1 deployment	April 2015	\$125k
Stage 2 deployment	January 2016	\$80k
Stage 3 deployment	September 2016	\$80k
Hosting and Support	Annual	\$60k

In summary, completion of this study has identified that this system development is possible, is likely to meet an unmet need, will incur costs of approximately \$470k over three years and could be in use by April 2015.

3. Introduction

Discussions within CPMEC have identified opportunities to promote the use of the Australian Curriculum Framework (ACF), and in doing so support pre-vocational medical training, through the development of an App and database that allows medical trainees to electronically log performance of a range of tasks and have these map to the ACF. This would facilitate professional development of trainees and track learning across the range of capabilities deemed key to effective pre-vocational training.

Based on the findings listed below, this feasibility study has confirmed that development and implementation of an ACF App and database system is feasible.

- All suggested functionality has been validated.
- User group survey testing indicates a positive view of the potential functionality.
- Requirements of the development have been clearly defined.
- Scope of the system is clearly defined.
 - System scope indicates the system is not a large scale development and hence there are few technical risks to a successful deployment.
 - System architecture and development processes can use standard methodologies and tools.
- Risks to the system development and deployment have been investigated and considered in this project plan.

The feasibility is contingent on the acceptability of the time and cost implication of system development. The detailed project plan, its timelines and associated costing estimates have been developed to clarify those implications.

The Project Plan describes a means for development of a system which will provide the IT infrastructure necessary to support an ACF App and database. The system will allow trainee users to enter data via a web application or an iPhone or Android App and to log their activities against ACF capabilities.

The requirements of the system are detailed in the Requirements document. The system will support all requirements listed, according to the development Stage. Core functions of the system include:

- Construction and ongoing maintenance of an electronic platform for the ACF
- Ability for users to log their training activities via a native device App or a web application against capabilities within the ACF.

Feasibility Study Methodology

The Feasibility Study methodology has sought input from a variety of stakeholders: trainees (via a representative workshop and survey), an IT Steering Group and the System Beneficiaries Group. A full list of participants is included at Appendix 1. The information provided has been drafted by the

consultant and presented to the stakeholders for feedback. The feedback has then been used to frame this final Report and its recommendations.

Feedback was sought via email of draft documents and via scheduled teleconferences.

Compilation of candidate requirements: The initial feature list developed by the CPMEC ACF App Reference Group was augmented in discussions with CPMEC.

Requirements Validation: A workshop was convened with recent trainee representatives from most states. The candidate feature list was discussed in the workshop. The features were assessed for their potential usefulness within this group. Some features were edited as a result of the workshop.

Trainee Survey: A survey of current trainees, asking for an assessment of the usefulness and practicality of the features was conducted. This resulted in a priority ranking of the features.

Functional Requirements: The prioritised functional requirements were discussed and refined by the IT Steering Group. This discussion resulted in the final detailed specification descriptions with the Report.

Non-Functional Requirements: The non-functional requirements were initially drafted by the consultant. Discussions with the IT Steering Group provided feedback on the initial options presented, guiding the final recommendations presented.

System Beneficiaries Group: The System Beneficiaries Group consisted of representatives of the Royal Australasian College of Surgeons, Royal Australian College of Physicians, Australian Health Practitioner Regulation Agency, Post Graduate Medical Councils, AMC (Pre-Vocational Committee) and hospital Medical Administration.

The System Beneficiaries group advised on the implications of the requirements from their organisation's perspective. This information has informed some of the requirements recommendations, as well as the risks and opportunities surrounding the system.

4. Opportunities and Risks

The proposed ACF system will comprise an ACF App and web application, with an associated web server and database system to support them.

Opportunities

The principal beneficiaries of the system are the prevocational education and training system, the trainees and CPMEC. Other parties that may derive benefit include trainee supervisors, hospitals, the specialist colleges and other accreditation and registration bodies.

Benefits to the Prevocational Education and Training System:

The principal benefits to the prevocational education and training system are:

- The system will increase integration of the ACF into the work practices of trainees thereby increasing the profile of teaching and training in prevocational medical education.

- Improve the ability of the educators/supervisors to target education of prevocational trainees to gap areas and therefore improve prevocational medical education and training.
- Potentially provide patient outcome benefits as a result of prevocational medical education and training being more informed.

Benefits to CPMEC:

The principal benefits to CPMEC:

- The system will represent a significant means of promoting the ACF.
- The system will provide powerful mechanisms for usage evaluation of the ACF.
- More broadly, the successful implementation of the ACF system will:
 - Provide a high degree of visibility, promoting CPMEC's role as a lead organisation in medical education and training in Australia.
 - Increase the profile of CPMEC amongst the trainee user group and subsequently promote the aims of the organisation.

Benefits to Trainees:

The system will provide trainees with a simple, effective and consistent way to record the activities and experiences that are of relevance to their training. Each activity will be logged against an ACF capability.

The ACF will provide a contextual structure for the total set of activities recorded, and will help the trainee to gain a sense of the progress of their training. This insight will be a personal one, over which the trainee will have full control.

The recording of activities and experiences will be able to be aligned to the domain and category structures used by the Colleges. This will assist trainees in preparing College entry applications and will help them to include all training activities that are of relevance to their applications.

Benefits to Supervisors:

Supervisors will derive an immediate benefit through provision of information to assist in carrying out trainee assessments. This assistance will include some of the administrative data collection activity, as well as providing functions to help with structuring the assessment process.

The system will help supervisors in identifying gaps in their trainee's learning plans and experiences, as well as providing structured reporting of which activities are commonly experienced during their terms, vs what may be receiving insufficient exposure. This information will assist supervisors to prepare additional tailored activities for individuals, as well as assist in assessing the learning programs that they provide during their terms.

Supervisors will also derive a secondary benefit as the system's usefulness to their trainees will itself be of significant benefit.

Benefits to Colleges:

The system will assist college applicants in providing the evidence to support their applications that aligns to some extent with the domain and category structures used by the Colleges. While it will not be possible to provide a direct alignment with portfolio requirements immediately, the system will allow applicants to organise their experiential record in a way that will assist Colleges in making their assessments.

Benefits to Accreditation Bodies:

The system will provide trainees a means of collecting a structured activity record, which they will be able to use as the basis of a range of reports. These may be used by hospitals to assist in their accreditation processes by providing reports as to what is covered in core rotations and of the ACF overall. Should hospitals find this sufficiently beneficial, this may assist Accreditation agencies in encouraging structured reporting.

Risks

The Risk Summary table below lists the risks:

- Risk
- Background Likelihood: Likelihood of the risk occurring if there is no mitigation or management of the risk.
- Impact if not managed: The impact of the risk on the success of the project, if the risk occurs.
- Foreground Likelihood: The likelihood of the risk occurring if the mitigation strategies are carried out effectively.

Risk	Background Likelihood	Impact if not managed.	Mitigation	Foreground Likelihood
Low uptake of the system by trainees. User perception that their data will not be protected, allowing others access to their activity records.	Medium <ul style="list-style-type: none"> • Survey indicates there is potential enthusiasm for the system • User group has a low tolerance for anything perceived to waste their time. 	Very Significant – low uptake of the system would remove the motivation for the system.	<ul style="list-style-type: none"> • Efficient and compelling functionality that is of direct benefit to users. • Clear and effective communication to users regarding system usage. • Broader drivers will also encourage system uptake. 	Low
Potential 'competition' from Applications developed by other medical education /	Medium to High.	Significant.	Ongoing communication and engagement with external organisations is	Medium

training organisations.			needed.	
Lack of support from supervisors.	Medium.	Significant.	Benefits to supervisors (direct and secondary) need to be clearly communicated.	Low
Lack of support from hospitals.	Medium.	Significant.	Benefits to supervisors (direct and secondary) need to be clearly communicated.	Low
Software development failure.	Low to medium.	Significant.	Project Management processes are being followed. These methodologies are designed to reduce this source of risk.	Low

These risks are discussed further below.

The Feasibility Study identified the following risks and issues, which may have a strategic bearing on the ACF system and its development:

1. The risk of low uptake of the application by trainees:
 - Key risks within this are that trainees may feel that the application:
 - does not provide them with sufficient benefit; and/or
 - will unnecessarily increase their burden of work and be an additional drain on their time.
2. Risk of trainee perception that the system data will not be protected, allowing others access to a detailed view of their activities.

Responding directly to these concerns will be essential to the success of the project. Key to doing so is ensuring that:

- The system development processes followed include efficient user interface mechanisms as a core design principle. This should lead to a set of tools that the user will feel are not burdensome and allow them quick and easy access to system functions.
 - In addition, the system should attempt to present compelling functionality, so that users feel that using the App is of positive, identifiable benefit.
- The system development and deployment processes ensure that user data is secure and protected, according to the Terms Of Use agreement.
- Communications strategies highlight the benefits to trainees and hospitals (and other relevant training providers) of use of the application and
- Communication strategies that emphasise the absolute restriction on access to individual user data and the ongoing means of ensuring system security and privacy.

Notwithstanding the critical importance of mitigating this key risk throughout the development and deployment, it is worth noting here that surveys of the trainees undertaken during the feasibility study indicate an enthusiasm and perception that such an application would be meeting a currently unmet need. For further information see the Trainee Survey Report.

The Feasibility Study identified the following drivers likely to motivate trainees in the use of the system:

- Increasing focus within medicine on personal responsibility for ongoing professional development.
 - Increasing competition amongst trainees for entry to College training programs: The system will provide a means for trainees to consistently and comprehensively track their learning activities.
 - The National Intern Assessment form will be mandatory from January 2015: Systematic Assistance in the completion of this form will be viewed favourably by both trainees and supervisors.
3. Potential 'competition' from Applications developed by other medical education / training organisations. Issues to consider include:
- A number of other medical education / training providers are considering similar tool development; in particular, the Royal Australasian College of Surgeons (RACS) is planning to provide an electronic logbook to trainees, to be made available to trainees from PGY1 onwards, regardless of their potential speciality.
 - At this time, CPMEC is in advance of other organisations with respect to developing an electronic system to provide to trainees.
 - If progress in system development continues, the ACF system may benefit from being able to establish a presence in the market before it becomes crowded with other systems that will potentially be produced for this user group.
 - CPMEC should maintain ongoing dialogue with these stakeholder organisations as the ACF system is developed and include their input in its development where appropriate.
 - There was consensus from discussions held during the feasibility study that CPMEC is well placed to develop the ACF system, given its national role covering all pre-vocational medical trainees.

Key strategies to mitigate this risk during the project are as follows:

- The progress and the visibility of progress, with an emphasis on deliverables, needs to be communicated to trainees and stakeholders on an ongoing basis.
 - The perception that development is 'dragging on' will reduce trainee's potential engagement with the system.
- Leverage CPMEC's key leadership role in medical education.
- Work collaboratively with relevant key stakeholders throughout the project life cycle. This will need to be addressed in the Communication Plan.

- Integration between systems should be encouraged where that appears to be a way of allowing different systems to co-exist within the 'market'. For example, this may allow the CPMEC system to collect data for PGY1 and PGY2, which is then transferred into a College system for subsequent training years.
 - Integration will require technical development as well as organisational cooperation.

- 4. Lack of support from hospitals and supervisors.
 - The support of supervisors in particular will be needed if the system is to succeed. Supervisors will need to be convinced that the system is providing a benefit to trainees and the training process. This will require responding to user needs and communicating project aims and objectives clearly.
 - Benefit to supervisor directly – helping with assessments and learning plans.

These risks and their mitigation have informed the development of the Project and Schedule. They will also inform any development activities that are carried out, as well as the Communication Plan and its implementation.