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APOSDLE: Advanced Process Oriented Self-Directed Learning Environment

Integrated Project

IST – Technology enhanced Learning

APOSDLE Use Scenarios and Requirements for 3rd Prototype

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4	2008-06-30	Internal review comments included
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Executive Summary

This document presents the user and system requirements for the third prototype of the APOSDLE system (P3); it does not include the set of requirements that have been previously agreed upon for delivery in month 36 of the project (documented in D VI.3).

The document builds upon other reports produced in WPVI, specifically:

- D VI.2: Use Cases and Application Requirements 1 (First Prototype)
- D VI.3: Use Cases and Application Requirements 2 (Second Prototype)
- D VI.7 Formative evaluation document
- D VI.13: APOSDLE Social solutions aligned to 2nd prototype
- D VI.15: Scope of APOSDLE Target Group, Problems and Needs

The requirements for P3 were gathered from various sources, including:

- **Focus groups.** They were held with a multinational manufacturing and services provider in the Aerospace, Marine and Energy markets counting thousands of employees, and a small Human-Computer Interaction consultancy providing user-centred design and research services to UK and international clients and partners. Both organisations were external to the APOSDLE consortium and the sessions yielded additional insights into the perceptions and opinions of potential customers of APOSDLE as well as possible requirements.
- **Findings from the Formative Evaluation meeting.** The meeting, held at City on the 15th and 16th May 2008, saw application and technical partners discussing their views on APOSDLE and the implementation of its second prototype (P2). The exchanges were audio and video-recorded and later analysed for possible requirements on P3
- **The online diaries used in P2's formative evaluation.** The diaries were used for the participants to record their thoughts, reactions, experiences and opinions during their use of P2; they provided valuable data on possible requirements for P3.
- **The social solutions aligned to P2.** A deliverable exploring the ways in which APOSDLE needed to fit organisations' environment, culture and practices was produced (D VI.13); it detailed how these factors could affect the system's adoption and integration, and its analysis yielded some insights into additional requirements.

The findings were analysed by Requirements Engineers at City and presented in adapted VOLERE templates (Robertson & Robertson, 2006).

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1 Introduction

1.1 Purpose of this document

The requirements for a system express the functionalities and the qualities the system must have, either because of the very nature of the system or because of the demands of the clients (Robertson and Robertson, 2006).

Some of the requirements for the APOSDLE system were identified in a previous, extensive requirements process that involved application partners representing different segments of future markets; the findings were reported in two deliverables: D VI.2 and D VI.3.

This segment of WPVI builds upon these findings; it continues the requirements process and extends it to potential future user organisations in order to specify the requirements for P3.

1.2 Scope of this document

This document presents the new findings for user and system requirements that apply to the third prototype of the APOSDLE socio-technical system; it does not include the set of requirements that have been previously agreed upon for delivery in month 36 of the project (documented in D VI.3).

As put by (Goguen & Linde, 1993), the requirements of real systems are rarely static and the requirements presented in this document will be discussed with both application and technical partners and may accordingly be modified and refined wherever appropriate.

1.3 Related documents

Documents and material previously produced within WPVI were consulted in the research and writing up of this report, namely:

- D VI.2: Use Cases and Application Requirements 1 (First Prototype)
- D VI.3: Use Cases and Application Requirements 2 (Second Prototype)
- D VI.7 Formative evaluation document
- D VI.13: APOSDLE Social solutions aligned to P2
- D VI.15: Scope of APOSDLE Target Group, Problems and Needs

2 Method used for the Requirements Elicitation

The requirements gathering for prototype 3 (P3) was carried in the continuity of the RESCUE requirements engineering process (Jones & Maiden, 2005) followed for the specification of the requirements for P1 and P2. This section presents the requirements gathering for prototype three of APOSDLE, the results of which are presented in Chapter 3 of this document.

2.1 Online diaries

Online diaries were used in the formative evaluation of P2. The diaries were open for about a month (April 2008) and participants in the application partners' organisations shared their day-to-day experiences while using P2, writing about their reactions and opinions to the tools and reporting on the integration of APOSDLE in their work routine. The contents of the diaries as well as the authors were logged and analysed for possible requirements stemming from the users' newfound experience with the system and their wishes for later implementations. More information about the diaries can be seen in D VI.7

2.2 Formative evaluation meeting

A Formative Evaluation meeting took place at City the 15th and 16th of May 2008. All partners (including application and technical ones) exchanged their views on APOSDLE, with the application partners giving their feedback following weeks of using P2 at their sites.

A walkthrough of the system took place during which all partners discussed specific parts of the application as well as APOSDLE as a whole. Video and audio recordings of the session were taken and analysed for extraction of possible requirements for P3.

2.3 Social solutions aligned to P2

Considering that the deployment of a technical system itself would not be sufficient, a deliverable examining social solutions to bring about the desired conditions for learning was produced (D VI.13). It explored how APOSDLE needed to fit the organisation's environment and how organisational culture and practices could affect its adoption and integration.

It was found that the social solutions aligned to P2, particularly those pertaining to enhancements to existing technical social solutions, yielded some insights into additional requirements as reported in Chapter 3 of this document.

2.4 Focus groups

Focus groups were held by City researchers with two organisations external to the APOSDLE consortium. Focus groups are a qualitative research technique in which participants that have been selected according to specific criteria (such as demographics, buying attitudes, backgrounds...) interact within a group (Morgan, 1997). Participants are encouraged to discuss between themselves the topics introduced by a moderator; they exchange anecdotes, comments and points of view in their own vocabulary. The exploration of ideas and issues of importance to the group, that are in relation to

the research, is encouraged and can take the research in new and sometimes unexpected directions (Kitzinger, 1994; Kitzinger, 1995). The insights that emerge from the discussions are recorded for later analysis.

For the present research, the organisations targeted were those that could potentially become users of the APOSDLE socio-technical system: those that, despite variations in size, field of operations and structure, had in common a relatively high proportion of knowledge workers among their employees. The aim of using focus groups in the requirements process for P3 was to record reactions to existing and/or desirable features of the APOSDLE socio-technical system, find out perceptions of APOSDLE and its vision, and discover concerns and possible obstacles to adoption that may be overcome in P3, all in order to validate the existing requirements and generate new ones.

Discussion guides and presentation materials were put together by the researchers in preparation for the meetings; details of the focus groups conducted are presented in sections 2.4.1 and 2.4.2 of this document, with the participants referred to using a coded notation rather than their names and that of their organisation for privacy protection.

2.4.1 Focus groups with Organisation A

“Organisation A” is a multinational manufacturing and services provider in the Aerospace, Marine and Energy markets. It has more than 20,000 employees fulfilling a variety of roles in the UK alone and understandably, the session reported below could only provide insights on the learning needs and strategies of a restricted group of employees, namely engineers at the UK office visited.

The engineers in Organisation A have a task-oriented approach and work on projects, often in teams. Access to the internet is restricted in the workplace for security reasons. An intranet-based system which use is mandatory is in place to support the provision and sharing of knowledge; engineers however seem to markedly prefer social interaction for learning and rely heavily on asking colleagues for information and relevant resources; it was estimated that 95% of learning by engineers takes place in face-to-face communication - *“People prefer talking to each other”* [#1].

A one-hour focus group took place in one of their UK offices on the 21st of January 2008; two APOSDLE researchers moderated and recorded the proceedings of the session.

In total seven participants attended the focus group (two of which via a conference call from other UK offices), including:

- an Engineering Design Specialist, Submarines section
- a Programme Manager, Civil Aerospace section
- the Chief of Requirements – Civil Aerospace section, with corporate reach
- an Engineer, Controls Product Families section
- a Whole Engine requirements specialist
- the Technical Lead for their in-house knowledge management system - Control Systems
- the Head of Engineering Process, head of their in-house knowledge management system

All participants had been working in the organisation for several years; their input to the session will be referred to with a number from #1 to #7 for identification (e.g. statements from participant 1 will be referenced with [#1])

The meeting started with an introduction to APOSDLE using a PowerPoint presentation and a digital movie produced by APOSDLE partners and demonstrating the first APOSDLE prototype (http://www.apostdle.org/publications/promotional_material/apostdle_prototype_1).

The discussion (reported in more detail in D VI.15) was then opened and yielded information on the participants' impressions and opinions on APOSDLE. Overall the following issues were brought up by the participants:

- **Conflicting goals between stakeholders**, specifically the organisation as a whole and the individual employee
- **Perceived Usefulness and Usability**, which was deemed paramount to the adoption and use of APOSDLE *“It must always deliver value, even if it is only someone’s telephone number”*. [#1]
- **Incentives and mandated use**, which was perceived as being unnecessary if the required usefulness and usability of the system was implemented
- **Automation versus User control**, with a participant stating in support of complete automation of the addition of data and metadata to the system: *“It should map processes, map where the information is, learn itself, and then show that to the users. An intelligent system. It needs to be without interference. If you expect people to add data, they’re already on a different task!”* [#3], although the need for the users to be aware and in control of the information available in the system was acknowledged
- **Privacy and Trust**, evoking the fact that the system may be perceived as monitoring employees’ performance and the need to address this perception.
- **Information Architecture**, with the participants expressing their thoughts on the information repository structures they considered useful for their work practice.

The reaction to this initial introduction to the APOSDLE system was very positive and led to a second, more in-depth presentation session being scheduled.

The second session took place on the 20th April 2008 at Organisation A's premises and lasted for 2h30: another presentation on the project was given by CITY, then P2 was demonstrated by KC after which further discussion ensued. The 8 participants from Organisation A were:

- a Knowledge Management Specialist
- a Chief Design Engineer (Control Systems)
- a Systems Dynamics Engineer (Control Systems)
- the Process Lead for Organisation A's in house knowledge management system
- a Software Engineer
- a Control Systems Engineer
- a member of the Defence department
- a member of Defence and e-Business/IT Function

In addition to insights in the organisation's perception and thoughts on APOSDLE, and possible requirements that are presented in Chapter 3 of this document, this second session had another outcome. Organisation A continued to express an interest in the project and discussed the possibility of having a further, more detailed demonstration of APOSDLE (possibly taking up a whole day) as well as the possibility for the management team to have hands-on experiences with the tool, which was communicated to other APOSDLE partners.

2.4.2 Focus groups with Organisation B

“Organisation B” is a privately owned Human-Computer Interaction Consultancy; they provide user-centred design and research services on a variety of projects to UK and international clients and partners. Most of the employees in the organisation assume the role of consultant; the rhythm of work is fast-paced, with the employees often working on several projects concurrently – most of the time individually, sometimes in teams of two. The services provided by the organisation are bespoke and hence vary widely from project to project as they depend on the clients’ industry and needs. Tasks carried out by consultants may include performing product testing and usability audits, providing

guidance on the technical execution of a product, and performing competitors analysis for the clients. Learning in the workplace is constant; it is paramount to carrying out the work and very much integral to the job of consultant in Organisation B. There is currently no explicit, formalised scheme in place in the organisation to structure and support employee learning although an in-house wiki has been put in place in a bid to centralise information and make it more easily available to all employees. The wiki is not much used however and at the time of writing, employees in Organisation B reported that their strategies for learning in the workplace mainly included asking around to locate colleagues with experience and knowledge that could be useful and performing internet searches for finding either relevant, up-to-date resources, or pointers to them.

A 70 minutes focus group took place in Organisation B's London office on the 13th March 2008. Two APOSDLE researchers moderated and recorded the results of the session; out of the company's 14 listed employees (at the time of writing), 6 participated in the focus group - 5 Consultants and one Operations Manager.

After an introduction to the project and the APOSDLE vision using a presentation and screenshots of P1, a discussion ensued.

Overall, the participants seemed intrigued by APOSDLE and its process-oriented approach, and kept referring to it in the context of project management more than learning or communication. The sequential description of a process according to tasks seemed to appeal to the participants' stage-based approach to projects, and the process description was seen as a GANTT chart, prompting discussions of ways in which APOSDLE could provide on-the-fly knowledge by considering constraints such as project deadlines.

The main themes brought up during the discussion pertained to:

- **Project management** – APOSDLE's process-oriented, self-directed learning environment raised questions regarding its ability to help plan and manage projects. One participant asked whether APOSDLE could indicate to the user the current stage in the process, while being able to offer users both an ideal and realistic course of action depending on time constraints (e.g. APOSDLE would suggest shorter resources for users under tight deadlines).
- **Expert availability/work overload** – The notion of 'experts' raised questions and concerns regarding experts' willingness and ability to collaborate with others and possible interferences with their ongoing work. Expert overload was a main concern and during the discussion the idea of a queuing system or 'pool of experts' was mentioned as a possible to manage collaboration requests. Participants also commented that since they were a small organisation and worked in an open space it would be quite impossible for experts to go offline and 'hide' (*"I know you are online! I can see you are eating a sandwich!"*).
- **Value of past relevant experience** – During the session, experience was frequently mentioned as an often-sought knowledge within the organisation. Accessing it was not easy since it was not always explicitly documented, and was mostly based on asking people "who worked in past with Vodafone?" or "Who worked on a project involving a PDA?" for example. Questions as to how APOSDLE could explicitly supports such type of knowledge and the extent to which it could be effectively captured in the first place were raised as the feeling was that these were stories shared on ad hoc basis, and lost when an employee left the company.
- **HR and privacy** – The notion of competencies raised the issue of how these may be used outside APOSDLE to assess employees by HR and management; it was interesting to note that the context monitoring mechanism did not receive much attention, positive or negative.
- **Communication protocol** – When presented with the collaboration tool, the issue of communication protocol and formality was raised as some participants wondered if users would communicate as they do via email or MSN messenger or be expected to simply

present questions. The collaboration concept was seen as something new that may require training as well as a protocol to define acceptable interaction style between users.

- **Sharing and merging collaboration outcome** – When shown the collaboration screen with visual links to knowledge artefacts, one participant wondered what the final format of the collaboration was and could it for example be emailed to someone (tangibility). The overall idea of visual collaboration seemed to generate interest, and the end result was perceived as a useful knowledge artefact. There were also questions as to whether related collaborations could be merged together for future reference, reinforcing the question of tangibility and how exactly collaborations could be used as knowledge resources by users.
- **APOSdle maintenance** – Updates to the domain model(s), competencies and knowledge resources raised questions regarding maintenance and the role of an 'APOSdle admin'. Once it was suggested that users themselves maintain the content by suggesting updates and ranking resources and people, there was a comment that: *"It is becoming like Wikipedia"*.

Overall, APOSdle was again met with a positive and interested reaction, with a participant commenting that *"With a Wiki you need to look for data – APOSdle brings the data to you"*.

3 Requirements on P3

This section presents the current status of the requirements for prototype 3 of APOSDLE. The data gathered from the sources described in Chapter 2 was analysed by Requirements Engineers at City; the results, most of which pertain to the APOSDLE system as a whole, are documented in an adapted VOLERE template.

3.1 VOLERE requirements specifications

VOLERE (from the Italian, “to want” or “to wish”) is the umbrella term for a generic requirements process as well as requirements training, consultancy and audits developed by Robertson and Robertson. It also includes a Requirements Specification Template – here referred to as a VOLERE template – that describes key attributes for requirements and can be used to guide their writing up.

This section presents the requirements for P3, documented using an adapted version of the VOLERE template. The attributes used are defined below in keeping with (Robertson & Robertson, 2006):

- Req#: a unique ID for the requirement
- Rationale: a justification of the requirement
- Description: a statement of the intention of the requirement
- Originator: who raised the requirement
- Supporting materials: documents that contain supporting information

Req #	Description	Rationale	Originator	Supporting Materials
System-Level Requirements: requirements on the APOSDLE socio-technical system as a single entity				
P3.63	A user using the APOSDLE system shall be able to flag outdated documents in the learning collection.	Users are likely to know better how current a document is and should be able to indicate the resources that are not applicable anymore or have been superseded by more up-to-date ones.	CCI	Email
P3.1	A user using the APOSDLE system shall be able to use URLs as learning resources	Users often use online resources and need the most up-to-date-version of a website for information. They hence would need access to live websites rather than stored copies through APOSDLE.	CCI	Email
P3.2	A user using the APOSDLE system shall be able to print out documents	Users often do not find time to learn at their workplace; it would be helpful if they could print out learning resources and take them home.	CCI	Email
P3.24	The APOSDLE system shall allow the use of web pages as learning events	Knowledge workers sometimes work with bookmarks, make use of web sites for work purposes, and would expect to see web pages as well as PDF files in the learning event section	CCI	Email
P3.25	The APOSDLE system shall be visually presented as an integrated unit	Users have expressed the desire to see APOSDLE presented in one window for usability reasons	CCI	D06.7
P3.36	A user using the APOSDLE system shall be able to adapt their content models to suit themselves	Content models change over time and from individual to individual and users may benefit from an easy to use possibility to adapt the initial models to individual and ongoing versions.	CCI	Email

Req #	Description	Rationale	Originator	Supporting Materials
P3.9	The APOSDLE system shall provide information about its status to users at any time	Users have reported being confused about the state of the system (e.g. working or hung up) and providing clearer feedback would address this as well as preventing the same commands being mistakenly issued to APOSDLE several times.	CCI, ISN, EADS	D06.7
P3.10	The APOSDLE system shall provide online help to the users	A help function would support and encourage users in their day-to-day use of APOSDLE as well as possibly providing an accessible place to present best practices of use (e.g. for annotating documents)	EADS	D06.7
P3.11	Online training on The APOSDLE system shall be provided within the system	Online training on how to use APOSDLE would support users in the best use of APOSDLE functionalities	EADS	D06.7
P3.12	A user using the APOSDLE system shall be able to group all APOSDLE system windows at once	Limiting the number of operations to group APOSDLE system windows when they are dispersed would improve the system's usability.	EADS	D06.7
P3.13	A user using the APOSDLE system shall be able to move all APOSDLE system windows at once	Limiting the number of operations to move all APOSDLE system windows in one operation would improve the system's usability.	EADS	D06.7
P3.15	The APOSDLE system shall clearly distinguish between the current activities and the available activities for a user	Unambiguous distinction between current and available activities and resources (e.g. tasks vs current task, learning events vs current learning event) would increase the understandability and usability of APOSDLE for users	EADS	D06.7

Req #	Description	Rationale	Originator	Supporting Materials
P3.16	The APOSDLE system shall display summary information about user-selected resources	Having summary information about a document such as its title, author, date, type, who annotated that document, etc. as well as an abstract would give users information on the document content, recency and authorship that would aid in the grouping and selection of resources.	EADS	D06.7
P3.35	The APOSDLE system shall indicate the number of resources displayed	Users have expressed the wish to have an at the glance knowledge of the number of available items for each resource type suggested by APOSDLE.	EADS	D06.7
P3.18	The APOSDLE system shall indicate annotations' authors	Indicating annotations' authors would enable users to follow personal preferences (e.g. annotation styles) in selecting resources, of to get back to annotations authors for clarifications if needed.	EADS	D06.7
P3.19	A user using the APOSDLE system shall be able to provide feedback on resources	Feedback on resources could inform the system and other users about their relevance, currency, or related materials among others.	EADS	D06.7
P3.20	The APOSDLE system shall clearly distinguish between knowledge artefacts and resources	Users are currently confused as to whether they access files (and abstracts of the files) or knowledge artefacts (and abstract of the Knowledge Artefacts) through their search results	EADS	D06.7
P3.21	The criteria used by APOSDLE to rate resources shall be visible to users	Users would find it useful to see resources rated, according to criteria such as their relevance or excellence for example	EADS	D06.7
P3.27	The APOSDLE system shall provide a visualisation of the learning goals for each task	Users have expressed a desire to be provided with visualisations of the learning goals for each task similar to that of the APOSDLE process view.	EADS	D06.7

Req #	Description	Rationale	Originator	Supporting Materials
P3.28	The APOSDLE system shall clearly distinguish annotations made by experts from other annotations	Clearly and visibly differentiating annotations performed by experts from annotations performed automatically by other users or the system would enable users to quickly spot them and eventually access them if it is their preference.	EADS	D06.7
P3.26	A user using the APOSDLE system shall be able to save an electronic copy of the resources suggested by the system outside of the APOSDLE system	Users may want to keep copies of suggested resources to work with them offline.	EADS, ISN	D06.7
P3.17	A user using the APOSDLE system shall be able to make personal annotations	Users have expressed the wish to make annotations for their personal use as well as more formal and expressive ones to share with others.	EADS, ISN	D06.7
P3.33	The APOSDLE system shall enable immediate user access to the relevant part of a document	Users have expressed the wish to have direct access to the most relevant part of a suggested document for their purpose (or the first one if the order of relevance is the same).	ISN	D06.7
P3.8	The APOSDLE profile questionnaire shall allow for scalable answers	Users would prefer sharing their estimations as to the level or their own knowledge rather than absolute answers (yes or no)	ISN	D06.7
P3.34	The APOSDLE system shall support natural language document parsing	Some organisations have very large repositories of documents that would need to be tagged for subsequent use in APOSDLE. Automatic tagging in such case would need to make use of natural language techniques to parse these documents.	Organisation A	focus group session notes A2

Req #	Description	Rationale	Originator	Supporting Materials
P3.64	The mapping of the tasks in APOSDLE shall be transparent to a user using the APOSDLE system	The mapping of the tasks in the APOSDLE system should be transparent to users in order to minimise interferences to their work and be truly blended in the background of their context.	Organisation A	D06.15
P3.4	The APOSDLE system shall have a well-defined scope of operation	It has been found through the use of similar tools that those which lacked scope and focus on specific tasks – trying to be “everything to everybody” - ended up not providing adequate services to the users.	Organisation A	D06.15
P3.5	The APOSDLE system shall support the different problem-solving approaches adopted by its users.	Knowledge workers tend to use very distinct problem-solving approaches and they all must be supported.	Organisation A	D06.15
P3.6	The APOSDLE system shall be functional without Internet access	Some organisations do not allow internet access in the workplace	Organisation A	D06.15
P3.7	The APOSDLE system shall be able to scale to a large knowledge base	In some organisations, for one line of activity, there are hundreds of thousands of documents dating back decades that need to be tagged then retrieved	Organisation A	D06.15
P3.29	The APOSDLE system shall manage collaboration requests	Expert overload is a main concern and automatic management of collaboration requests is necessary to avoid it and attempt to ensure all requests have an equal chance of being handled.	Organisation B	focus group session notes B1

Req #	Description	Rationale	Originator	Supporting Materials
P3.30	The APOSDLE system shall permit different levels of access to the system	External (e.g. client) access to APOSDLE (“like an extranet”) was mentioned as it was discussed as a potential tool for client training; restrictions as to the parts and the functionalities of the system that are accessible under these circumstances are needed.	Organisation B	focus group session notes B1
P3.31	The APOSDLE system shall flag updates when resources have been updated	Highlighting updates within a document rather than leaving users to spot them for themselves is less time-consuming and lowers the likelihood of some of the updates going unnoticed.	Organisation B	focus group session notes B1
P3.32	The APOSDLE system shall enable users to manage user groups	APOSDLE should support communities of practice due to their importance in informal work based learning. Enabling users to manage their professional circles and giving them quick and easy means to communicate and share information with groups as well as individuals would benefit the uptake of the technology while working towards more efficient collaboration, working and learning in organisations.	Social solutions	DVI.13
P3.37	The APOSDLE system shall enable users to assess their social nearness to other users	Social nearness here refers to the number and strength of ties between individuals (that can be represented by common contacts or groups). This could encourage the initiation of collaboration requests for those users who find they have mutual contacts with expert(s) they do not know otherwise.	Social solutions	DVI.13

Req #	Description	Rationale	Originator	Supporting Materials
P3.14	A user using the APOSdle system shall have control over the visibility of their activities for other users	In order to respect the privacy of users, they should have a choice of whether to display their activities (including learning events) for other users to see or keep them private.	CCI	D06.7
P3.22	Tasks in the task selector shall be listed in their prescribed order of execution	It is useful for learning and guidance in executing tasks to have them listed in their prescribed order of execution (if existing) in the task selector.	EADS	D06.7
Use Case 2: Generate or Update Knowledge Artefacts and Store them in Underlying System				
P3.38	The APOSdle system shall permit the validation of learning resources prior to their addition to the knowledge base	Having a validation process (performed by managers or experts for example) prior to adding documents to APOSdle could contribute to the quality and relevance of the resources and hence improve the usefulness of searches.	EADS	D06.7
Use Case 4				
P3.41	The APOSdle system shall permit Boolean searches	APOSdle must enable users to perform complex searches, including those using AND, OR, and a combination of these terms.	CCI	D06.7
P3.42	The APOSdle system shall permit multicriterion searches	The search function (« search for ») in APOSdle is currently relatively limited; users would benefit from being able to perform searches using multiple criterion	EADS	D06.7

Req #	Description	Rationale	Originator	Supporting Materials
P3.39	The APOSDLE system shall deliver information of value to the user for each use	APOSDLE needs to deliver value to the user with each use - even if only the name and contact details of appropriate experts - in order to keep its credibility and encourage the uptake of the technology	Organisation A	D06.15
P3.40	The APOSDLE system shall provide up-to-date resources	Ensuring that up-to-date as well as relevant information is submitted to the user is necessary to establish and maintain the credibility and usefulness of APOSDLE.	Organisation A	D06.15
Use Case 4a: Find and Contact Relevant Knowledge Workers				
P3.43	A user using the APOSDLE system shall be able to see all other connected users	Having a list of all people currently online as well as one of experts based on tasks would be useful, for example to contact users that are not already listed as experts by the system, to contact "novices", or to get back to users on previous collaborations. It would allow for collaboration independently from current resources	ISN	D06.7
P3.44	A user using the APOSDLE system shall be able to search for other users	Users might want to contact specific users (e.g. some that they have previous communications with).	ISN	D06.7
Use Case 4b: Find Learning Material				
P3.46	A user using the APOSDLE system shall be able to search by annotations	Users have expressed the wish to search by annotations	EADS	D06.7
P3.47	The APOSDLE system shall indicate the degree of relevance of suggested resources	Degrees of relevance of the resources (e.g. 100% relevant, only 10% relevant etc.) would help users selecting the most appropriate resources for them	EADS	D06.7

Req #	Description	Rationale	Originator	Supporting Materials
P3.48	A user using the APOSDLE system shall be able to filter suggested resources by language	Users may prefer to consult only resources in the language(s) they are fluent in	ISN	D06.7
P3.45	The APOSDLE system shall provide content-specific information about how to resolve specific problems	Based on semantic analysis of the problem to be solved, the system should be able to provide information pertaining to solving that particular problem.	Organisation A	D06.15
Use Case 8: Monitor User Context and Work Context				
P3.49	The introduction of APOSDLE in an organisation shall prevent its perception as an employees' monitoring tool.	APOSDLE could be perceived as a monitoring tool, which would deter users from using the system and undermine their trust in, and loyalty to, the organisation. Technical or social solutions that address these concerns should be in place	Organisation A	D06.15
P3.50	A user using the APOSDLE system shall feel in control of the monitoring tool	Feeling in control of the tool and its features, notably the monitoring feature, would encourage users to trust and use APOSDLE	Organisation A	D06.15
P3.52	The APOSDLE system shall be able to infer constraints on the user from the user's work context	APOSDLE would be expected to automatically infer constraints on the user by interfacing with other tools such as the user's calendar for example	Organisation B	focus group session notes B1
P3.51	The APOSDLE system shall be able to adapt to work constraints	APOSDLE would be expected to be 'smart enough' to appropriately react to the constraints (such as limited time) that could impact a user's ability to learn effectively, by suggesting different, more condensed learning resources for example.	Organisation B	focus group session notes B1

Req #	Description	Rationale	Originator	Supporting Materials
Use Case 9: Store information				
P3.55	A user using the APOSDLE system shall be able to add new documents to the learning collection	Users might know of documents that should be added to the learning resources, and doing so should be an explicit function	CCI	Email
P3.54	The APOSDLE system shall be able to store legacy knowledge	Some of the legacy knowledge (about products, systems and projects) in the organisation goes back more than four decades and is in a variety of formats	Organisation A	D06.15
P3.56	Adding data to The APOSDLE system shall be possible without exclusively relying on users input	Users move on quickly from one task to another and in all likelihood will be too busy to tag or record task resources after starting another task.	Organisation A	D06.15
Use Case 12: Collaborate				
P3.57	The APOSDLE system shall support the use of the Sametime instant messaging tool	It is the only collaboration tool available at some of the AP's organisation	CNM	D06.7
P3.58	The APOSDLE system shall permit sending the resources it provides by email	Being able to email resources would be useful for self-reference by the user when away from computers with the APOSDLE client or for forwarding useful resources to colleagues	ISN	D06.7
P3.61	A user using the APOSDLE system shall be able to choose if parts of a collaboration should be published	Users should have control over their collaboration transcripts as it could be intermingled with personal matters for example.	ISN	D06.7

Req #	Description	Rationale	Originator	Supporting Materials
P3.59	The APOSDLE system shall support third-party approval on collaboration content	Third party approval on collaboration content may in some cases be necessary to authorise future use of the knowledge hence captured.	Organisation A	focus group session notes A2
P3.60	The collaboration tool should encourage its own use for professional rather than personal purposes.	There is a concern that employees may spend their time chatting through the tool rather than working.	Organisation A	D06.15
Use Case 14: View User Profile				
P3.62	A user using the APOSDLE system shall have their personal annotations listed in their own profile	Having personal annotations listed in a user's profile would allow for a quick access for the user himself and for other users if the list is public	ISN	D06.7

4 Comments and Conclusion

As expected, the requirements on P3 discovered in this latest requirement process did not imply major changes to the implemented and working functionalities, but mainly expressed needs and wishes for additions to existing functionalities (e.g. add annotations to possible search criteria, P3.46), new functionalities (e.g. printing, P3.2) and the usability of the system (e.g. handling of the APOSDLE windows in P3.12). Some requirements were influenced by knowledge and experience of P2 (e.g. P3.12 about the grouping of APOSDLE windows) and hence were very closely linked to the current implementation of APOSDLE. Although they may not be relevant to P3, they were still documented as requirements on P3 because they expressed needs (for a better usability in this example) that may inform the development of P3.

More requirements than those documented in this report were gathered from the application partners during the requirements process. They however revealed to be repeats of previously captured requirements that either had not been implemented yet (such as requirements on APOSDLE to be available on mobile devices) or had already been fulfilled in P2 even though their implementation was not always visible to users: for example, an application partner expressed the wish for system-suggested resources to be displayed in order of relevance, which has been implemented in P2, but not explicitly so to the user.

Opinions were also expressed during the focus groups which were not recorded as requirements since clearly the system in itself or the solutions put in place around it could not have guaranteed their satisfaction. The gathered opinions may however be of interest to the marketing of APOSDLE and its successful embedding in organisational settings. For example, a focus group with Organisation A revealed participants strongly felt that the unique selling points of APOSDLE ought to be very clearly put across to prospective and current users. The reasoning was that the understanding of what sets APOSDLE apart from other similar systems was crucial not only to initiate interest in the system, but also to set accurate and realistic expectations as to its potential. Similarly, clearly putting across the value of the system both for organisations and for the individual users was deemed crucial for organisations to consider using it and, importantly, for the users to adopt it.

5 References

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