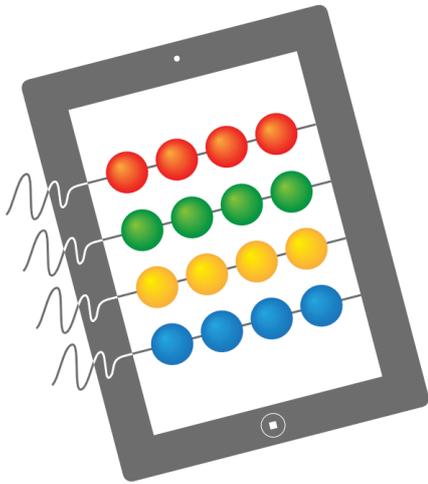




FP7 ICT STREP Project



LEARN PAd

Deliverable D9.4

Business Oriented Learn PAd Whitepaper

<http://www.learnpad.eu>



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Abstract

This paper introduces process oriented learning in form of five scenarios: (a) individual training, (b) organizational evolution, (c) business process support and reflection, (d) process optimization and improvement, (e) citizens transparency.

Process oriented learning is introduced whereas (1) the business process defines the curriculum, (2) the knowledge product defines the required knowledge and (3) the knowledge sources identify the available knowledge. The end users are using the knowledge by learning, whereas the responsible decision makers and experts are managing the knowledge and the learning by appropriate learning goals and dashboards.

The technological infrastructure using existing legacy applications that are integrated via a Web-based collaboration platform for learning purpose is introduced and some guidelines for the change towards process-oriented learning are highlighted.

Keyword list

Process Oriented Learning, Process Oriented Knowledge Management, Individual Learning, Organizational Evolution, Performance improvements, Citizens transparency, Process-Oriented Learning IT-reference architecture

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1 Introduction in Process Oriented Learning

A major challenge within today's Public Administrations is to manage the increasing complexity and flexibility of business processes with continuously reduced available resources and increasing demands on the quality of the outcome.

This pressing challenge can only be fulfilled if organizations evolve towards a more efficient and flexible way of performing their tasks – the improved business processes.

Improving the performance of business processes, by streamlining activities in daily work and interpreting the business process not only as a sequence of actions to achieve the organizational goal but also as a knowledge platform of the organization, allows for an improvement in efficiency.

Learn PAD argues to train the workforce of an organization using business process management according to particular skill profiles. In this respect, the Learn PAD approach is seen as an add-on training mechanism that is plugged into existing approaches, or as a means of building up necessary business process management.

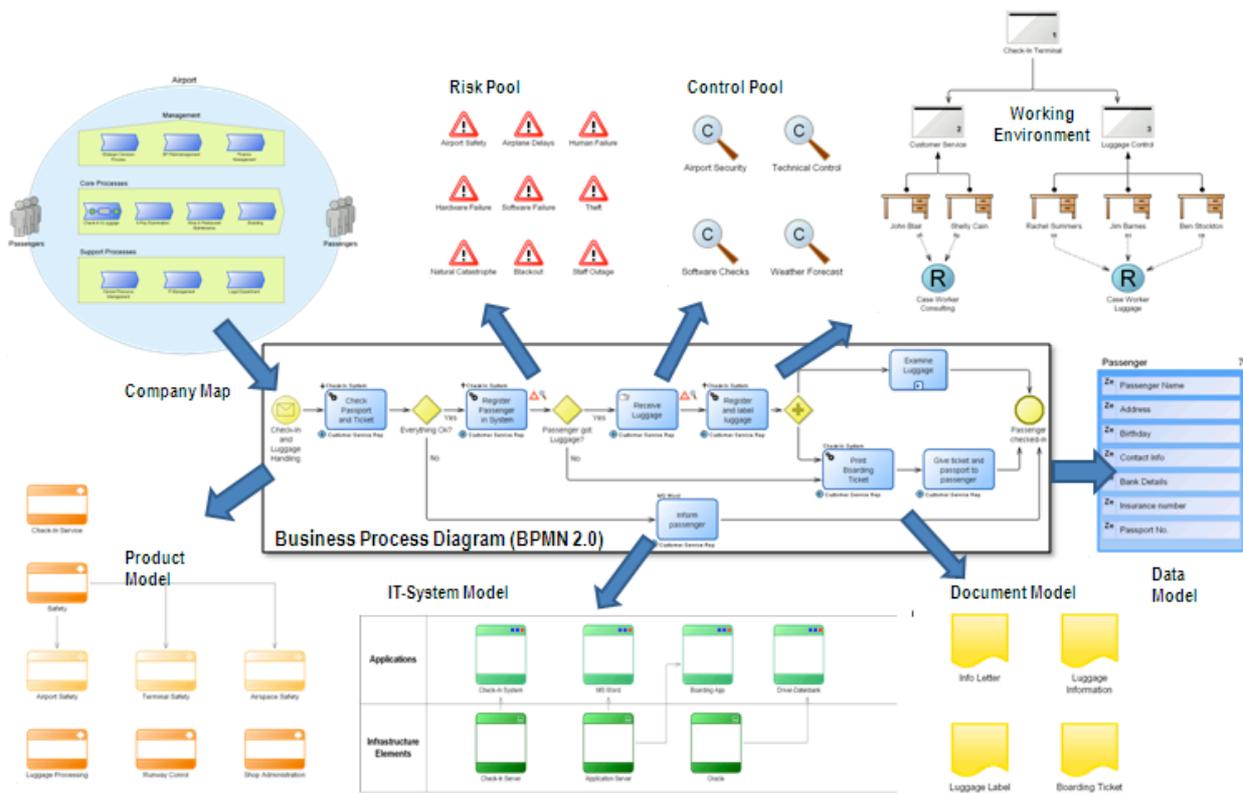


Figure 1 Business Process Model as Integration Platform

Graphical representations of activities are seen as the starting point. It has been proven over the past decades that graphical representations of business processes are an intuitive and transparent way of explaining working procedures, highlighting key personnel and identifying knowledge intensive areas.

The following approach hence builds upon past findings that:

- Streamlining daily work according to processes increases transparency and efficiency,
- A graphical documentation enables faster communication, increases common understanding and simplifies the identification of critical or knowledge intensive tasks,
- Information and training material are linked to the corresponding steps within the business process to not only explain what has to be done, but also how and with which tools,
- Information and internal training can be better and quicker aligned to – new – business processes,
- Knowledge management and the education of staff can be better and quicker aligned to actual needs in daily work, as well as
- Training material and work material do not need to be duplicated, as training material is embedded into the working environment via the business processes.

In addition to this, Learn PAd improves aforementioned business process oriented training and learning by:

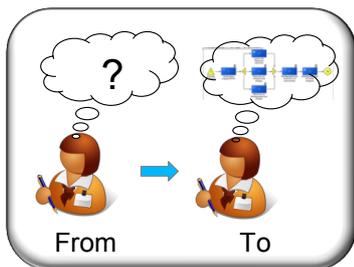
- Merging the working and training environment into one business process oriented collaboration platform enabling a tighter alignment and quicker release of training material and adding real-time collaboration with in-the-field experts,
- Closer alignment between business process and organization evolution through advanced – semantic – analysis of real-world working or simulation results that allow immediate alignment and response as well as
- A simplified graphical representation to overcome conceptual modelling burdens, and an advanced collaborative business process environment to improve business process evaluation and the education of working staff.

In the next chapter, concrete usage scenarios are presented.

2 Usage Scenarios for Process Oriented Learning

In this chapter, five scenarios are provided to support business process oriented learning in public administrations. 1) Individual training is intended to support novices; 2) Organizational evolution supports organizational change, such as the introduction of a new business process; 3) Support and reflection enable clear insights into the real world execution of business processes, 4) Process optimization and improvement addresses continuous improvements via a bottom-up reflection and hence enables organizational learning, whereas 5) Citizens transparency enables consumers of services to learn about the required information for necessary decisions of the public administration.

2.1 Individual Training



“Mrs. Mayer starts work in the accounting department of a public authority. Although she performed a similar task in her past job, the forms, procedures and tools are different. Thanks to Learn PAd, she is practicing the processes on her own, and consults experienced colleagues only from time to time, with a collection of concrete and contextualized questions supported by intuitive tools. The interaction with experts becomes more efficient.”

The education of new employees is time consuming, as not only the new employee’s time but also the time of experienced colleagues is required. The new employee typically lacks the organizational context. Hence many questions or knowledge gaps are not caused by a concrete task, but are the result of a fundamentally missing baseline knowledge of the organization. In addition to being more time consuming than if the employee could experiment on their own, explanation of both the organizational context and the solution for a concrete task depends crucially on the availability of experienced colleagues. In order to support individual training, different learning goals for different skill profiles are defined, so that a learner can continuously improve their own skills through executing the business process.

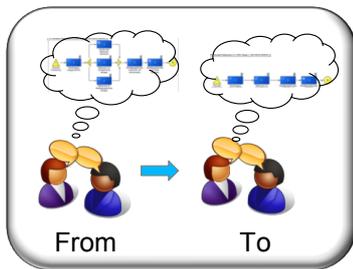
Although the installation of a training and simulation center for new employees has significant advantages – with respect to the efficient training and education of these employees, it is very often not installed as the installation of such an environment is time consuming, expensive and rather inflexible as the training material is created for each new business process. Learn PAd merges the training and working environments in a business process oriented manner, so that changes to business processes affect both the working environment for the daily tasks and the corresponding training environment.

Training material is limited to relevant, and hence stable, topics whereas task descriptions, templates and relevant information are provided for both – the working and the training environment. Through the alignment of knowledge provision for both the working and training environment, the effort in building up and maintaining a training and simulation platform is massively reduced. In addition, the special focus on collaboration allows for a close cooperation between experienced and new employees. Hence the reliance on only a handful of colleagues is overcome since, through the collaboration features, it is expected that other experts that are not directly known by the novice are answering questions.

The assessment of training and simulation actions as well as the collaboration logs, enables much better insights into education status and training demands. Learn PAd follows a bottom-up strategy by observing the user behavior in typical working conditions and deducing the relevant training and simulation plans from observations in the log files.

A common entry point in the form of a business process portal, providing collaboration features that are used by both experienced staff and novices, generates a valuable resource for training and decision makers.

2.2 Organizational Evolution



“A new regulation requires a different procedure on invoicing for public administration. Although the whole team is working together for several years, the new regulation requires a change within the department. The whole department needs to be educated to perform the invoicing correctly from the date when the new regulation becomes effective onwards.”

Similar to individual training, this process-oriented approach can also be applied to the development of the whole workforce within an organization.

In order to organizationally evolve the business process, learning goals need to define which part of the business process is to be changed, and – by involving skill profiles of team members – analyze how certain skill profiles are to be educated.

This scenario, the assumption that a new business process, a new regulation, or a different topic has to be treated by the organization, is similar to individual training.

Such new regulations often require a change in business processes; which results in the need for new skills, procedures and templates.

The conditions are similar to individual training as employees are challenged to learn something new, even though the organizational context is the same. Although the overall scenario is the same as before, Learn PAd supports collaborative learning by supporting the interaction among colleagues while they get acquainted with the new process in synergy and supporting each other.

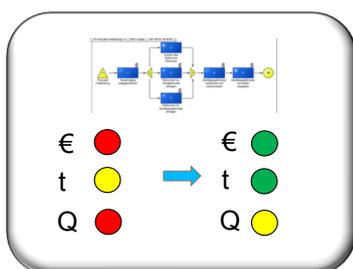
In addition to changes in the sequence of a particular process, knowledge of existing business processes can also change. Here the situation is different to individual training as users are very familiar with the process and usually claim that they know exactly what to do. The challenge is therefore to increase sensibility to minor, but important, changes.

This is typically achieved through special simulations or by trainers.

Learn PAd uses the collaboration environment and establishes communication, either within the simulation environment or within the working environment. Hence a specially targeted simulation, training or work-assistance system can be configured to improve dedicated but important parts of business processes.

For a continuous workforce improvement and evolution, Learn PAd enables the identification of learning goals via continuous simulation, training and work-assistance. This persistently draws attention to important aspects and hence – through continuous reminders, and education – improves the performance of the overall business process.

2.3 Support and Reflection



“One department has intensive contact with citizens. Although the team is highly experienced in the procedures, every team member is fully committed and produces a high throughput, citizen complaints are increasing. Obviously minor errors are emerging and contributing to an unnecessary poor impression of their work. Hence, the team should be reminded carefully of the original, agreed upon and correct procedures.”

Business processes provide a continuous performance support as relevant information is indicated by each step of the business process. By using business processes and their explanatory documents as learning objects forces the public administration to critically reflect the current way of working and enables the detection of error prone parts.

In order to support the performance and reflect on the current business processes, learning goals are defined that indicate which part of the business process needs to be improved.

An honest reflection on business process performance is usually very difficult as employees ideally need to critically reflect on their daily business within a so-called “failure-culture” in the organization – a culture that appreciates the identification of failures instead of pseudo-blaming some responsible actors.

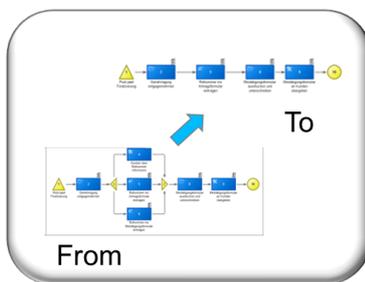
Even in the case where an organization has a well-established “failure-culture”, performance analysis needs a guiding structure. Business processes are an ideal candidate for such a structure as they enable a step-by-step analysis of daily operations that in total must result in an efficient sequence of activities that achieve organizational goals.

Hence, simulating real world sample cases in the Learn PAd simulation environment allows for reflection on how different team members would have managed the case. Additional indicators measuring the execution of the business processes in combination with the known skill-profile of the performer provides a much deeper insight into the performance than traditional business process logs.

A simulation session that is performed by a team can be more concretely reflected on in terms of a post-action review and identifying improvement potentials.

This solution enables the running of simulations of existing business processes that are performed by a team or individuals who are very familiar with the business process and hence allows the identification of improvement potentials at a high level.

2.4 Process Optimization and Improvement



“Mrs. Johnson performs the final check before financial figures are reported. Although the process of collecting the information is well understood and performed, the final check often identifies unnecessary errors. This causes annoying correction of figures across the whole process. Mrs. Johnson proposes to perform additional checks at earlier stages. Although this is more time consuming, errors can be reduced and hence the total process time – including annoying corrections – is reduced.”

Process optimization and improvements are closely linked to performance support and reflection mentioned previously as they rely on the existing competencies of the team members that are actually performing the business process in their daily work.

In order to support continuous improvement and optimization of a business process, learning goals can be used to identify the organizational learning objectives and identify the corresponding measures.

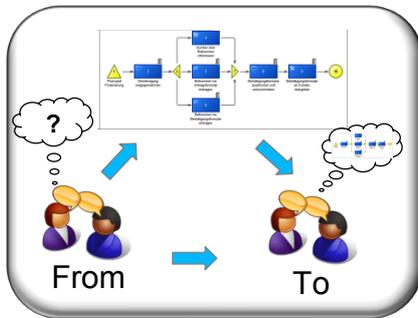
Using Learn PAd as a collaborative infrastructure permits mutual improvement of the working and learning environments and therefore allows typical users to add comments, suggest a certain behavior, request changes and hence to continuously improve the business processes.

In this scenario the team members use the learning platform as a communication and collaboration portal. Continuous optimization and improvement can therefore lead to an evolution of the business process. This is seen as bottom-up organizational learning, based

on continual improvements and suggestions from those users who execute the business process in their daily work.

The intention is to use LearnPAd not only for the initial identification of improvements and suggestions in a cooperative manner, but also to use those improved processes when performing the aforementioned organizational learning scenario.

2.5 Citizen Transparency



“Mr. Smith is a successful business man and regularly interacts with a public administration. It seems that information he provides is always incomplete although he uses the defined forms and some queries put to him seem to have no relation to his particular case. He simulates the process within the learning suite and now understands which decisions are important, and what type of relevant information is required. The next time he highlights relevant information. Surprisingly, no further information was necessary.”

This use case is not a traditional training scenario where the staff of a Public Administration is educated and trained, but is an add-on use case with the aim of addressing the citizen that interacts with the Public Administration.

In order to increase transparency for citizens, learning goals are defined that address either the reduction of misunderstandings, incorrect submitted documents or increase appreciation.

Under such special conditions the collaborative, process-oriented training platform can be provided to citizens who interact with the administration. As with organizational evaluation, the citizen can partly use similar functionalities: see transparent documentation of the process, read relevant information, and ask certain questions.

Similar information and features to those used in the training scenarios for new employees can be applied for citizens with the aim of making processes transparent and checking if the provided input is correct. Of course the process will not be represented in detail, but on a higher abstraction to only point out the relevant decisions for the citizens, as well as only including high level information.

Such a simulation of the business process focuses on the interface and not on the actual execution, hence input documents, estimated time of execution, critical issues that may come up, and the way the result is presented will be the focus of such a simulation.

3 Approach and Technology of Process Oriented Learning

Process Oriented Learning has its origin about two decades ago and has close relationships with Process Oriented Knowledge Management. In our case we follow a business-oriented approach, hence we identify the business process as the curriculum and therefore all learning goals indicated in the previous chapter aim to support the business process.

In the next sections the process oriented learning approach and the necessary technological framework to setup the IT infrastructure are introduced.

3.1 Process Oriented Learning

The challenge of realizing process oriented Learning is to bridge the gap between the demands of the end user and available knowledge. The knowledge requirements of the users are typically defined in well-established business processes, hence the knowledge demand on requirements, documents, guidelines and templates are usually available.

The challenge is that however to fulfill the well-established demands with concrete knowledge that is mostly in people's heads and cannot be made explicit. Most of the required knowledge is unstructured and vague and hence difficult to capture. Hence the approach to link documents and well-structured content to well-structured business processes will result in a nice representation, but will most likely not reflect the real world and thus not support the knowledge demands of users.

Here a concept from knowledge management can be introduced that successfully tackles the aforementioned challenge, the so-called "Knowledge Product" (Figure 2). A knowledge product provides knowledge in a consumable form, which is used by the users of business processes while they are executing the process.

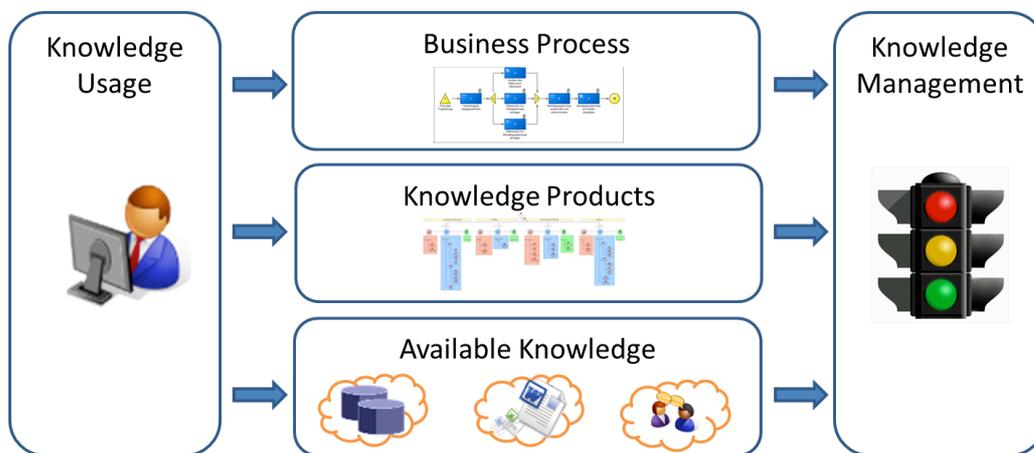


Figure 2. Process Oriented Knowledge Usage and Management

Knowledge products are not limited to explicit knowledge such as documents, but include:

- (a) any information product, such as newspapers, publications, links, databases and so on,
- (b) any service, such as helpdesk, experienced colleagues, training sessions, meetings, coffee corners and the like, and finally
- (c) any application that interprets data such as specialized spreadsheet programs, rule based platforms, workflow engines or interactive surveys.

Hence the business process is linked to consumable “knowledge products” that are defined according to the requirements of the users in the corresponding team. The concept of making knowledge accessible in an agreed way supports both, the top-down approach, by creating knowledge product that are required, but also bottom-up, by observing how knowledge is provided and used currently.

Some teams deal with implicit knowledge and hence need a structured way to deal with services like meetings, asking experienced colleagues or job rotations as a knowledge product. Whereas other teams deal with explicit knowledge and hence need support in classifying documents, storing information or searching in data bases as a knowledge product.

The right mixture of implicit knowledge – services as knowledge product - and explicit knowledge – information as a knowledge product - depends on the concrete working situation of a team.

Learning goals derived from knowledge products can therefore be distinguished as:

1. Improving the existing knowledge products – hence improving the content.
2. Exchanging the existing knowledge product for a better one – hence improving the organization.

Each knowledge product is interpreted by either a human user or by a machine. A meeting with an experienced colleague will make sense for a novice but not for a computer program, whereas the workflow specification file makes sense for a workflow engine but not for a user. Our approach provides models for both (a) the human interpretation with graphical business process models for supporting users, as well as for (b) the machine interpretation with formal models supporting the configuration of a simulation engine.

Hence knowledge belongs either to human interpretation or machine interpretation.

In the case of human-interpreted knowledge, the learning goal may be:

3. Improving the skill profile of a person, a team or an organizational unit

In the case of machine-interpreted knowledge, the learning goal may be:

4. Improving the technology, functionality, usability, data format etc.

Such a classification results in the well-known portfolio of knowledge management initiatives within an organization: (a) Human Users, (b) Information Technology, (c) Organization and Semantic, as well as (d) Content.

Process oriented learning can be realized through referenced knowledge products that describe all variations of the real world related to the business process.

In order to realize this approach within an organization, an organization needs to:

- Describe the relevant business processes, the existing knowledge products, the organizational structure including available and aimed skill profiles, as well as the content within knowledge sources.
- Realize this approach within the existing IT and application infrastructure so that current systems and applications can be used, and are combined through a collaborative business process interaction portal. This portal does not integrate all applications, but provides Wiki Pages with comments to support human users in using those existing applications.

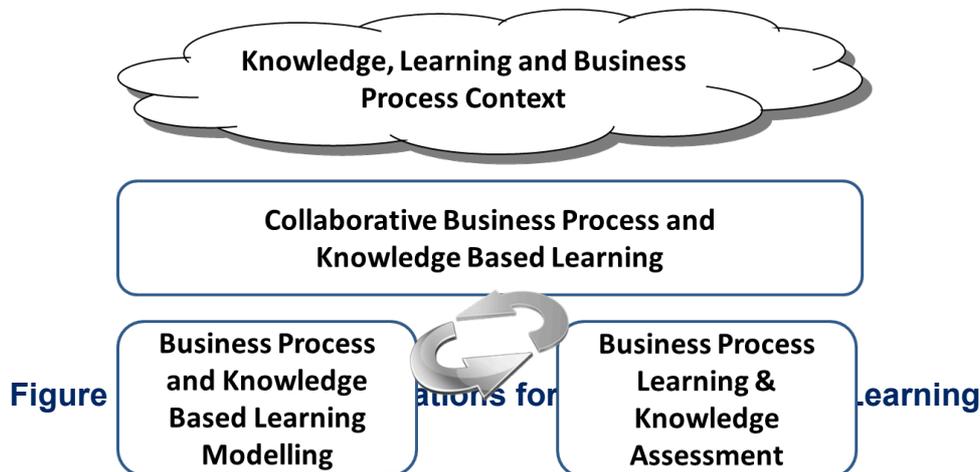
- Define Learning goals to focus on concrete improvements and define key performance indicators to measure those goals. It is reasonable that special log files of the learning platform are used to identify if the learning goals are approached.

3.2 Tools and Application

In this section we present the initial separation of concerns by the high-level reference architecture building blocks for knowledge and learning systems.

Figure 3 indicates the major building blocks from the reference architecture:

- (1) Knowledge, Learning and Business Process Context that considers the complex and heterogeneous operative legacy systems of the end users organization,
- (2) Collaborative Business Process and Knowledge Based Learning that enables a process-oriented learning from knowledge workers,
- (3) Business Process and Knowledge Based Learning Modelling enables the definition of learning processes that are then realized in the aforementioned execution environment, and finally
- (4) Business Process Learning and Knowledge Assessment introduces monitoring and dashboard functionality to identify improvements opportunities.



In the following the four building blocks are described:

Knowledge, Learning and Business Process Context: is a collection of relevant legacy applications that are necessary to execute the business process. In order to enable the seamless implementation of process oriented learning within an organization, the available IT infrastructure has to be considered as it is, and the process oriented learning framework has three choices to interact with the existing applications.

First integration is a loose link from the learning system to the legacy applications. This is most likely the first choice, ideally if the legacy application is a Web-application. Hence, this will be a Hyperlink to the Web-interface of the legacy application

Second integration is via an implemented API. This will be used if valuable learning or feedback information is required from the concrete legacy application. In the case where a social enterprise tool, enterprise wikis or similar are already in place, it may be worth implementing an interface. (e.g KPI container)

Third integration are learning system components that are added to the IT infrastructure, hence the integration is given by the use of the learning system.

Pragmatically, a Wiki environment that describes how to access the legacy systems and providing the necessary links is the most appropriate way to start with a process oriented learning system.

Collaborative Business Process and Knowledge Based Learning: is a collaborative platform that is specially configured to support business processes. Traditional business process descriptions that are exported in collaborative Web-platforms are enriched with learning functionalities, such as stepping through a process, starting simulations, commenting on documents and knowledge as well as assessing learning progress.

Business processes can be trained by the user either in a manual or automatic way. The manual way is performed by stepping through a business process, reading the documents and discussing with colleagues whether the decision that would have been taken is the correct one. Automatic training of a business process is understood as simulation, whereby the process is triggered and the trainees have to commit their decisions into the system.

Collaborative Business Process and Knowledge Based Learning workspace provides all functional capabilities for a user-friendly entry point into the process documentation, the manual stepper and the automatic simulation. Business processes are presented graphically, the corresponding documents, the required skill level and the capability to provide feedback and comments in form of an intuitive Wiki are provided in the form of a collaborative environment.

Process Simulation for Learning is used by the knowledge worker in order to learn how the process has to be executed. Depending on different skill levels the process is simulated in a form that the knowledge worker performs each step with the correlated content. Hence the process is not executed directly but simulated with the aim to derive findings from recorded clicks and links. Focus is the end users interaction with the platform and with the process so that the user learns to perform the process in practice.

Business Process and Knowledge Based Learning Modelling: is used by trainers to design business process models for public administration. Typical conceptual and semantic modelling will be applied to define relevant conceptual artefacts that are processed for management and improvement.

Modelling covers typical capabilities like (1) graphical visualization of models, (2) query and analysis features of models, (3) simulations of graphs as well as (4) transformation into different input and output formats. Depending on the platform and usage scenario the aforementioned generic modelling feature are differently grouped or detailed.

Collaboration and Feedback transforms the previously made “Wiki-like” collaboration functionality into the modelling tool. Hence track changes, ratings or comments may be considered in this group.

Business Process Learning & Knowledge Assessment: is used by experts and trainers to analyse the use of the business processes and assess which part of the process is well supported and trained and which needs adjustments. A dashboard displays key performance indicators that enable the assessment of the maturity, skills and training levels of the process and its end users. It is seen as a cockpit for the trainer that represents KPIs for learning and knowledge maturity in a Scorecard like presentation.

The aforementioned grouping of high-level functional building blocks describes the major components, which can be added into an existing working infrastructure and the organization’s site.

4 Change towards Process Oriented Learning

This last section introduces how to perform the change towards a process oriented learning environment and when to expect the first results from the Learn PAd project.

4.1 Organizational Change towards Process Oriented Learning

The change towards process oriented learning in an organizational context requires certain preliminary steps. Firstly, the identification of relevant business processes and analysis of existing knowledge products is performed with necessary improvements being noted.

The approach is to formulate these improvements in terms of initiatives that are implemented in a stepwise approach. Such initiatives fall into the following main categories:

- Organizational initiatives assign responsible persons for the process-oriented learning approach, setup a project team, formulate learning goals, etc.
- Content initiatives deal with the creation of training material, the quality approval of existing materials, modelling the business processes, etc.
- Human/Workforce initiatives deal with projects to setup skill on process-oriented learning, assessing and designing skill profiles, capability to define learning goals, etc.
- Technology initiatives finally deal with the installation of the process-oriented learning platforms, starting with the modelling environment to setup the business processes, followed by setting up the collaboration space for manual and then for automated learning, and then finally the setup of the learning assessment applications.

The Learn PAd platform and the combination of considerations from above – in particular the processes and training material – are chosen to fit the needs for each workforce. As the change towards process-oriented learning is highly organisational depended, some statements to correctly identify the initiatives from above are listed:

- Clear goals and the expected impact of process oriented learning have to be clearly worked out in sufficient detail so that it can be measured by concrete measures and transparently communicated.
- Business process models have to reflect the real world situation and hence have to be represented in a way such that all workforce members can easily identify themselves in the context of those business process models.
- Modelling is a time consuming task, hence efficient, economic and pragmatic modelling decisions are required and existing material needs to be re-used.
- Knowledge Workers need to be included from the beginning in the selection and modelling of business processes, as well as in the planning and creation of skill profiles and training materials.

4.2 Project Timeline

The project Learn PAd (www.learnpad.eu) started in February 2014 and hence provides the first results in February 2015. Initial prototypes, approaches and guidelines can be received within the first half of 2015.

First prototypes of the overall platform will be available in summer 2015 and hence can be tested in the second half of 2015.

Second and final prototype will be available before summer 2016, and hence can be used from summer 2016 onward.