Learn PAd: Collaborative and Model-Based Learning in Public Administrations

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1. MOTIVATIONS

The Public Administration (PA) sector is today characterized by the need to continuously improve the quality of services delivered, and introduce new ones triggered by both legislation and modern society fast evolution. The adoption of the European Interoperability Framework challenges the PAs from the European member states to cope with several and interconnected procedures, which are often documented and modelled in terms of Business Processes (BPs).

A BP describes a collection of activities, messages, and forms that the PAs have to elaborate in order to produce a service to their end-users (i.e., citizens, company, or other PAs). Such services are usually articulated in three main phases: i) activation (e.g., request, or documentation); ii) processing, while either performing activities that add value (i.e., checks), or producing evidences: in both cases the processing uses resources (i.e., humans, information, structures); iii) release of a set of produced artefacts as output (e.g., permission, licenses, or rights). Furthermore, it is evident that a BP of a PA must also comply with all regulations governing the subject of the service.

Designing and understanding BPs for PAs is a complex, interdisciplinary, and time consuming task that often involves judgements based on domain knowledge and experience. From the point of view of a civil servant, complexity is also raised by the fact that BPs typically include several alternative scenarios, many of which are seldom activated and may be thus not well understood. Moreover in many cases a collaborative effort involving several PA offices is required to fulfil BP objectives. Finally the introduction of new regulations, or their frequent modifications, results in the intertwined modification/deletion of already established BPs, or can lead to the creation of BPs that were not originally considered. In short, the management of BPs in PAs require that civil servants continuously acquire complex knowledge.

Learning and mastering such knowledge is challenging. Part of it is usually learned from past activities. In many cases, notes and insights are scattered among manifold "knowledge containers" spanning from the personal memory/notes, to some official information system. Nevertheless, it is often difficult to use such pieces of "best practice" in a coordinated manner that can take into account both the documents content, and the document context (i.e. the creation situation, the potential usage situation).

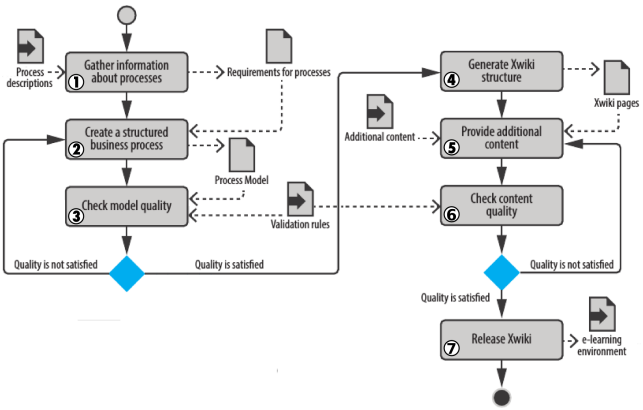

Figure 1: Models and Contents Production Process

The European project Learn PAd (Model Based Social Learning for Public Administrations)develops solutions for merging the context given by a BP in order to collaboratively organize knowledge archives that could support civil servants in learning, managing and mastering the complexity of PA processes. Learn PAd promotes the engagement of civil servants in learning activities at different times (e.g. before or while serving real citizen requests), following different paradigms (e.g. informative or performative), and by different means (e.g. accessing descriptions or asking for suggestions to experts). In addition Learn PAd considers collaboration a fundamental paradigm to improve performance within PA, and in particular it suggests to transform civil servants in "prosumers" of learning materials, giving them the possibility to share their experiences and expertise.

2. MODELS AND CONTENTS IN Learn PAd

Learn PAd envisions a methodology for the collaborative modelling and learning of BP-oriented procedures in PAs. Figure 1 sketches the main steps about the models and contents production process. The organization of a set of activities in a PA starts with the identification of the formal set of laws, rules and procedures regulating them (①). All this information is explicitly structured and codified using a graphical BP notation (②) and is possibly linked with other artefacts modelling information objects (e.g. documents and data), organizational structure business motivation (e.g. policies, strategy, goals, objectives and influencers). Models and their relations are checked to assess their structural and semantic quality (③); if these checks fail, further iterations on the modelling phase are requested, else the models are the input of an automatic synthesis process that structures

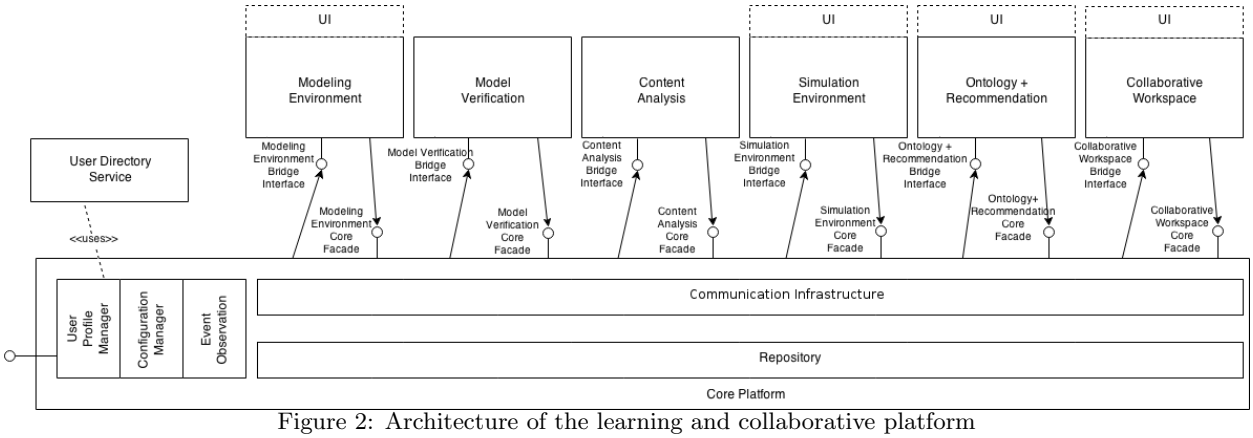

Figure 2: Architecture of the learning and collaborative platform

and populates the e-learning platform supporting collaborative and wiki-like facilities (i.e. the Learn PAd platform – ④). Note that most information about a PA process comes from sets of regulations in natural language (e.g. laws, and procedures that cannot be modified). Thus often quality issues on the model representation (e.g. non termination of the BP, or deadlock) are due to alternative interpretations of such regulations.

The models structured as a collection of interlinked wiki pages provide a valuable source of information grasping the BP objectives and context. In this sense, Learn PAd enables informative and process-driven learning, as the civil servants can browse and access the information codified in the models. The wiki-like representation of the BP structure, its data, and its business rules, enable communities of civil servants to collaboratively develop documentations, to provide hints, to report real execution cases, and to identify people to contact as experts (⑤). Moreover it fosters the continuous upgrade of such information directly by the personnel working within each BP. For each new contribution, further quality procedures and check about the contents produced are enabled (⑥); for example in order to support the identification of potential ambiguities or contradictory documentations. If no issues are raised, contents are released on the platform and become part of the additional documentation of a process (⑦).

Many types of models are relevant for describing complex organizations (e.g. a PA). Such model types convey information that are relevant for learning in order to act within the organization. While BP modeling is usually done by well-structured tasks expressed in some standard notations (e.g. BPMN2), many processes in the PA are knowledge-intensive. Here the BP syntax is perceived as too rigid, and other kinds of specifications that can better deal with partiality of information and some intrinsic uncertainty are needed. Therefore the learning process envisioned by Learn PAd has to cope with knowledge artifacts that are specified in some language that better models human interactions (e.g. where a minimal predefined encoding of the work to be performed is expected). For such reason Learn PAd supports the modeling of cases using the case management model and notation (CMMN).

Another relevant issue to be addressed concerns how the civil servants perceive their activities in a BP. For example, how their actions in an task would impact on some organizational goal. Besides, the structure of an organization is arranged and how it enacts a BP must be considered. Such kinds of information are not usually caught by a BP representation (e.g. BPMN 2.0). In Learn PAd, the explicit link to BMM (Business Motivation Model), and Organizational Model and Competency models support processes in PAs using a multi-scale views with different levels of abstraction.

Finally, it is important to notice that the above learning approach is complemented with a procedural learning approach based on simulation and monitoring of the BP models (learning by doing).

3. Learn PAd PLATFORM ARCHITECTURE

The approach to model-based learning described above has led to the definition of an e-learning platform that is currently under development. The platform, thanks to the definition of proper model trasformations, permits to complements the graphical representation with a wiki infrastructure which is organized to reflect the model itself. This will allow modelers, and collaboratively the civil servants, to complement the models with additional contents that are considered useful to learn what to do when citizens' requests for services are received. The guiding principle in the definition of the Learn PAd architecture was to have a modular system where components could be plugged-in as needed. This provides future adopters and developers with flexibility in configuring the system with respect to the learning needs of different organizations. In particular the different components in the platform support different learning paradigms that may be adopted separately or in combination.

Figure 2 shows the platform components. The system has been structured according to the black board architectural style where data shared by the different components are stored in a centralized place, and are made accessible to all the other components via suitable interfaces. In addition an event based communication infrastructure has been included to notify components about relevant changes in the repository, using a push interaction strategy. Thanks to a plug-in infrastructure the architecture is easily extensible to include additional components for instance to analyse the data related to the activities carried on by the learners.

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