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ICT Development and Business Process Modelling in the Legal Domain: The Experience of e-CODEX

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Abstract[1]

In the last 30 years, the use of ICT spread into the justice sector with the aim of improving performances and reducing costs. While the justice domain has many distinctive features that makes ICT development and deployment particularly complex compared to other domains, design techniques and methods that proved to be successful in the broader ICT world, have been more and more introduced and tested in this difficult environment. This paper focuses on Business and Process Modelling (BPM) methodology, as a way to navigate the legal, organizational and social complexity of developing e-Justice services. First born for the analysis and improvement of private business processes through the use of graphical representations, the methodology has been largely utilized also for software design in complex organizations. After introducing the main literature on the BPM, we present the case of e-CODEX EU co-funded project, which developed an e-delivery platform to allow secure cross border exchange of judicial documents. The analysis allows grasping some of the strengths and limits of this method, and to learn important lessons on the relationship between BPMs' use and the legal performativity of e-justice.

Keywords: e-Justice; e-CODEX; ICT development; information infrastructure; e-services.

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1. Introduction

In the last 30 years, the introduction of ICT has been one of the main innovation thrusts and one of the main challenges for Justice systems all around the world. The driving idea is that, when properly linked to the automation of court procedures and practices (Fabri and Contini, 2001; Contini and Fabri, 2003; Velicogna, 2008; Reiling, 2010), and when properly used to support the communication between courts and parties (Contini and Lanzara 2008; Velicogna, Errera and Derlange, 2011; Velicogna, Errera and Derlange, 2013; Lupo and Bailey, 2014), "ICT can be used to enhance efficiency, access, timeliness, transparency and accountability, thus helping the judiciaries to provide adequate services" (Velicogna, 2008: 6). In many countries, "statutory reforms have been introduced to allow the use and the exchange of electronic data and documents within national judicial systems" (Velicogna, 2007a) and ICT infrastructures (Contini and Lanzara, 2008; Contini and Lanzara, 2014). The e-justice service analyzed in this study, e-CODEX, can be conceived as the next step created to interconnect and make interoperable the e-justice systems developed so far within Europe and to allow the cross-border provision of e-justice services.

Cross border judicial procedure have an increasingly relevant role in the life of EU citizens, business organization and public administrations. This paper looks into the complexity of designing, developing and implementing a technological infrastructure for the electronic exchange of documents in cross-border judicial procedures. In this study we investigate some of the processes that are activated in order to design and develop complex e-justice services. In many organizational contexts, the design of ICT systems is anticipated by an analysis of the organization's business processes through different types of techniques that can be included in the ample category of business process modelling (BPM)[2]. The analysis of business processes for ICT design and development through BPM is now spreading also in the justice context. In this particular context, the complexities related to ICT development are exasperated by the need of taking into consideration the procedures disciplined by EU and national norms and the practical application of these norms in the Member State legal context. Moreover, differently from other contexts, in the justice systems the design and implementation of a functioning infrastructure is not enough: once the ICT system has been developed and is technically working, it has also to support a communication exchange recognized as legally valid according to EU and national regulations. The research question we addressed in this study is if the application of a preliminary BPM analysis can be a valuable strategy for developing effective e-justice systems, and which are its potentials and its limits. Moreover, the study attempts to investigate the relationship between the preliminary analysis of business processes and its results in terms of systems' functional and legal performativity. We acknowledge that in the justice systems context, the gathering of information on business processes in order to design an e-justice system by focusing on the procedural norms does not allow grasping a complete picture of the real procedural practices and this may hinder the performances of the new system and the users' uptake. We analyse BPM strategies and their effects on the performativity of e-justice systems by focusing on e-CODEX case. e-CODEX is an EU Co-funded Large Scale Project aiming at developing a technological infrastructure for the improvement of access of citizens and businesses to cross-border justice in Europe. It has also the aim of fostering the interoperability between national e-justice services and between legal authorities. E-CODEX project ran from December 2010 to May 2016, involving 25 partners, mainly Ministries of Justice or their representatives. The developed infrastructure is utilized for the trans-border exchange of legal documents in different legal procedures, so called "use cases" in e-CODEX terminology. The focus on a cross-border e-justice system allows shedding some light on the complexities related to the design of an infrastructure

[2] See for example Becker et al. 2000, Recker et al. 2009.

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that has to connect different e-justice tools (developed in different national contexts) and justice systems (with different practices and different national legal frameworks related to the application of the European procedural norms).

After introducing e-CODEX project, the paper goes into deep in the specific topic of BPM and legal performativity by focusing on the activities of process and data modelling that brought to the design of the e-CODEX infrastructure in the context of its first functioning pilot (EPO). The analysis shows that the service was built not only looking at the general process provided by the EU Regulation but through the creation of a shared understanding of the actual practical application of the European procedure. Despite this, parts of the procedure, considered outside the scope of the project (as the payment of court fees or the procedure of notification which is delegated from the EU Regulation to the national rules) were not included, if not through some limited information provision. This limitation in the analysis of business processes has limited the scope of the technology that cannot overcome the issues of the paper-based procedure. In this section (section 5), the paper provides a description of the use-case development process, from the initial preliminary investigation of EU cross-border judicial procedures available for piloting purposes, to the current functioning of the pilot. This includes: a) the definition of the business process modelling approach used to gather the system requirements, which was mainly based on the letter of the EPO EU Regulation and on the forms it provides; b) the discussion over member states' technological and normative installed base in terms of e-delivery and e-signature and their implications for the e-CODEX infrastructure; c) the development and testing of the actual technology in preparation for the piloting of real cases.

To shed light on the practical application of the infrastructure designed through BPM techniques, the paper looks at the EPO procedure from the user perspective, uncovering the main issues that the technology does not address but that are key for the user to complete the procedure. Indeed, while the developed technology may be considered technologically sound, the users' uptake remains scarce posing at risk the significance of the project and the sustainability of the platform. The paper investigates how and why a technologically successful project is struggling with the last steps needed to become a relevant justice services provider for EU citizens and companies. A big question related to this topic is the capability and limits of the approach adopted in reaching a sufficiently high number of users and ensure long-term sustainability. Building on Information Infrastructure development (Hanseth and Monteiro, 1997; Monteiro and Hanseth, 1996; Hanseth, Monteiro and Hatling, 1996; Contini and Lanzara, 2008; Velicogna, 2014) and on reflective experiment in technological design literature (Hanseth, 2002; Lanzara, 1991), the paper concludes reflecting on the importance of the preliminary stage of process and data analysis for the development of systems capable of performing their functions in a real world environment and on the possible development strategies that could support e-CODEX next moves.

2. Some Words on the Research Methodology and on Key Concepts

This paper explores e-CODEX and its experience of Business Process Modelling to create a cross-border judicial services infrastructure through an in-depth case study. We chose this investigation approach because case study has shown to be an effective way to study large scale ICT phenomena in the broad area of justice (Rosa, Teixeira and Pinto, 2013; Velicogna, 2007a). In general, in-depth case studies are the preferred strategy when 'how', 'who' or 'in which way' questions are being dealt with, when the researcher/author has little control over events, and when the focus is on a contemporary phenomenon within some real-life contexts (Yin, 2003). These elements characterize the investigation of large scale ICT

EQPAM Volume 8 No.1 January 2019
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ISSN-L 2285 - 4916

innovation. Furthermore, the case study methodology allows the use of an interdisciplinary approach, which is particularly relevant in an area where multiple factors (such as legal, institutional, technological and practical) are deeply intertwined (Velicogna, Errera and Derlange, 2011). For what regards the analysis of the e-CODEX case-study, data have been collected through an analysis of the relevant documentation developed by the project (project Deliverables, reports, meeting minutes), both through the longitudinal and participant observation of the project development. The participant observation methodology utilized, reflects the principles of the interpretive ethnography approach. This method largely explores phenomena within a particular cultural and contextual setting from the perspective of the informants (Myers, 1999). The ethnographic research involves lengthy and extended fieldwork among informants and therefore allows the researcher to get a privileged view of the action (Van Maanen, 2011; Shankar et al., 2013). Several recent ICT-related studies clearly utilized an ethnographic orientation (see Rangaswamy and Nair, 2010; Shankar et al., 2013), also in the e-justice field (Kallinikos, 2001; Lupo, 2014; Lupo and Bailey, 2014). In the case of e-CODEX analysis, our approach is clearly ethnographic due to our involvement as researchers of a research institute partner (IRSIG-CNR[3]) in the e-CODEX project. Being involved in the project, we could easily gather data for the research not only through the analysis of documentation but also through face-to-face contact, participant observation and informal interviews.

With regards to the analysis of BPM techniques, this has been carried on by inventorying the main literature on the topic and by focusing on the main documentation developed by organizations as the OASIS (see section 3.1), that deal with BPM standards and models.

Two concepts have been found particularly useful in guiding the present investigation and helped us defining what is being created by the e-CODEX project: a. information infrastructure; and b. performativity. Infrastructures typically form when multiple and heterogeneous systems merge, as in the case of e-CODEX, where national systems and other pre-existing technological components are brought together (Velicogna, 2014). The concept of Information Infrastructure allows to grasp the nature of a complex phenomenon, which has different properties from those who normally associate with technology and which follow different development and evolution logics. Hanseth and Lyytinen (2011: 3) described an "information infrastructure as a 'shared, open, heterogeneous and evolving socio-technical system of Information Technology (IT) capabilities". IIs (information infrastructures) are recursively composed of other infrastructures, platforms, applications and IT capabilities and they are controlled by emergent, distributed and episodic forms of control. II's evolutionary dynamics are "nonlinear, path dependent and influenced by network effects and unbounded user and designer learning" (Hanseth and Lyytinen 2010: 1). These features can be recognized in the history of e-CODEX technological infrastructure's development and use, and help understanding potentials and limits of BPM applications. The second concept which is key to understand the nature and development logics of a complex cross-border e-justice systems as e-CODEX is that of performativity (Austin, 1962). For the e-justice systems to perform their tasks, communication does not just need to take place, it must be legally valid and result in changes of legal status. In other words, it must be performative in the cross-border legal domain (Mohr and Contini, 2011). This is indeed an element which should always be kept in mind when analysing e-justice implementation, as the involved actors typically give for granted in their actions that authority and recognition of justice systems and their procedures are rooted in the material, social, spatial and temporal dimensions of the judicial communication. In this perspective, "the creation of a technological platform that mediates the procedure and components affects not only the material components of the communications (documents, receipts, etc.) and their social and legal value, but also the material and institutional settings of judicial proceedings"

[3] Research Institute on Justice Systems of the Italian National Research Council.

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(Velicogna, 2014: 311). In the end, it should be noted that only the actual use of the system allows the testing of its capability to perform as an information infrastructure and of being capable of supporting legally valid exchanges in real world situations.

3. An Introduction to Business Process Modelling

Business Process Modelling (BPM) can be defined a method of representation of an organization's business processes with the aim of analysing them and providing a shared understanding. Business process is intended as a "combination of a set of activities within an enterprise with a structure describing their logical order and dependence whose objective is to produce a desired result." (Aguilar-Saven 2004:129). Often the objective of business process analysis is to improve the functioning of the organization, increasing speed and quality of processes and or reducing costs. Efforts to graphically define through flow chart, functional flow block diagram, control flow diagram, Gantt chart, PERT (project evaluation and review technique) diagram, and IDEF (Integration DEFinition) have been made since the beginning of the 20th century (Dufresne and Martin; 2003). The first to arrive in 1899 were the Gantt charts in 1899 and the flow charts in the 1920s. More recently, methods as the Unified Modelling Language and Business Process Model and Notation have been developed. As a comprehensive definition of the different methodologies utilized, the term 'business process modelling' was first utilized in the 1960s in the field of systems engineering by Williams in the article 'Business Process Modeling Improves Administrative Control' (1967). In the 1990s, when organizations started to focus on processes instead of functions and procedures, the term became popular. Moreover, since 90s, new methodologies have been developed as business process redesign, business process innovation, business process management, integrated business planning (Rolstadås; 1995). Furthermore, successively, the business process analysis started to be utilized in support of the software engineering (Warboys; 1994).

In general, the BPM techniques have the objective of capturing business processes in several contexts from private businesses to public administration through the use of core graphical elements each representing a specific role, function, action, or connection (Kazemzadeh et al. 2015).

The mapping of practices and processes utilized in an organization, serves then as the basis for designing enterprise architecture and/or new business processes or for introducing IT technologies that will support these processes (Giaglis, 2015). In the particular context of organizational IT designing, developers utilize the process map provided by BPM for gathering the high-level system requirements that will be at the basis of system's development (Kim, 2002).

Moreover, by graphically representing practices, roles and activities through flow-chart with a high level of detail, the process simulation evaluation and design is facilitated (Becker, Rosemann, von Uthmann, 2000). The modelling of business processes is not only utilized for information system design or for the redesign of business practices, but it is also used for investigating on services delivered to customers, for describing enterprise architecture, costs and human resource planning (Kazemzadeh, Milton and Johnson, 2015) and for explaining future changes to stakeholders (Holt, 2000). The several techniques developed have been recently supported by software modelling tools, such as CASE tools, Workflow Management Systems, process modelling software, and others.

As anticipated, techniques of business process modelling are diverse, but all tools focus on the description of the way activities are ordered in time. The description and graphical representation of ordered steps report how one activity can serve as the input to another one. Modelling does not only focus

EQPAM Volume 8 No.1 January 2019
ISSN 2285 – 4916
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on the temporal aspect, but also on the spatial aspect: i.g. where the activities are executed (Vondrak, 2007).

BPM techniques are primarily utilized by business process analysts who interview actors and key stakeholders involved in the process, in order to reconstruct and describe processes in an unambiguous syntax. Also, designers of business process definition or IT designers utilize these tools to create graphical representations of processes, design IT architectures and gather user requirements (OASIS Standard v2.0.4, 2008).

Despite BPM analysis and relative modelling is carried on by business analysts or IT experts, the product of the analysis is usually addressed to all stakeholders involved in the business processes investigated. Therefore, the "language" and the graphical representation of business processes have to be accessible not only for technicians. Aside this, there is a growing number of different modelling techniques and modelling tools and an increasing number of model designers and users.

The necessity of fostering the understandability of models and also aligning the different BPM techniques and languages, brought to the development of guidelines, standards and uniform notation languages. For instance the framework "Guidelines of Modeling" (GoM) contains a set of design recommendations that have the aim of increasing the quality of models and on the basis of which models can be evaluated (Schütte and Rotthowe, 1998; Becker, Rosemann, von Uthmann, 2000). The GoM consists of six guidelines: principles of correctness, relevance, economic efficiency, clarity, comparability, and systematic design (Schütte and Rotthowe, 1998).

As uniform notation language, several techniques have been designed and introduced. For instance, Service Blueprint (Kingman-Brundage, 1991) has been especially developed for service marketing and it is based on the customer view. Indeed, business analysts in this case will directly involve customers in order to map and visualize service, customer contact points, underlying support processes, and other process functions involving customer experience (Bitner et al., 2008). Moreover, a further example of uniform language is the Process Chain Network (PCN) introduced by Sampson in 2011 (Sampson, 2011). Differently from Service Blueprint, the PCN focuses through flowcharting techniques on a balanced perspective of the provider-customer relationship with the aim of describing the interaction between provider and customer.

One of the most known and utilized notation language is the Business Process Modelling Notation (BPMN). The BPMN was developed and then published in 2004 by a consortium of tool vendors (BPMI Notation working Group; BPMI.org 2004). BPMN is constituted by a core set of constructs and by an extended set of constructs. The core set is utilized by business analysts and non-technical users to map and describe high level business modelling processes and activities that are understandable by all stakeholders (Ko et al. 2009; Recker 2011). Differently, the extended set of constructs is utilized mainly by technical users who want to draw more complex technical diagrams in order to carry on "workflow engineering, simulation, or web service composition" (Recker 2010, p.183).

As seen in this section, due to the many objectives and users interested by the BPM techniques and the interdisciplinary fields in which techniques have been developed, the BPM methods are several.

In the case of e-CODEX, the business processes mapping and the translation of them into operative XML schemas have been carried on by utilizing ebXML (Electronic Business using eXtensible Markup Language) specifications and the BPSS (Business Process Specification Schema) standard.

The ebXML specifications have been sponsored by the United Nations (UN/CEFACT) and OASIS for use in the field of e-business frameworks definition (Aissi, Malu and Srinivasan, 2002). The ebXML Business Process Specification Schema is basically a standard utilized for specifying and mapping collaborations between entities with a particular focus on the exchange of business documents. The

ISSN 2285 – 4916
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primary audience of BPSS are both business process analysts and designers of business process IT tools that have the aim of translating business maps into the XML representations (OASIS Standard v2.0.4, 2008). In BPSS, business analysts utilize a set of choreographed units that describe business transactions between partners. Each business transaction may have a requesting (incoming) document and an optional responding (outgoing) document.

BPSS also allows mapping business signals that indicate a business transaction's current state as for example, an acknowledgment of receipt document (Aissi, Malu and Srinivasan, 2002; Kim, 2002). Business process mapping also includes the definition of roles, i.e. the actors that participate in the collaboration, as for example, a buyer role that can initiate the business transaction and the seller role that responds. On the basis of the BPSS schema description of the interoperable business processes, technicians can design the XML schema. Designers will extract and "transform the necessary information from an existing Business Process and Information Model and create an XML representation" (OASIS Standard v2.0.4, 2008: 15). The BPSS have been principally created to define the business processes related to the exchange of documents between two or more different entities, while other schemas mainly address business processes at the internal of each organization (Lupo and Velicogna, 2015). For this characteristic of BPSS ebXML methods, they have been utilized in e-CODEX, given that the project addresses the issue of the exchange of valid juridical documents between authorities or between citizens and justice institutions. In the following section, we will introduce the research case study, e-CODEX, by focusing on the project's governance and on its technological infrastructure.

4. e-CODEX

The e-CODEX project experience provides an interesting example of e-justice infrastructure development and allows to observe the potential and limits of BPM in a very complex techno-legal setting. This section is intended to provide a background on e-CODEX project, its objectives and results, in order to put into perspective the BPM effort undertaken. As previously mentioned, e-CODEX is a EU Co-funded project which aims to "Improve the cross-border access of citizens and businesses to legal means in Europe as well as to improve the interoperability between legal authorities within the EU".[4] The project's duration was initially of 36 moths, then extended to 65, running from December 2010 to May 2016.[5] The project had an overall budget of €24m (EU contribution: €12m). The project was implemented by a large consortium, including 22 Ministries of Justice or their representatives, the representatives of the EU legal professions - the Council of Bars and Law Societies of Europe and the Council of the Notariats of the European Union - and research representatives, through the National Research Council of Italy.

The first years of the project were directed to determine the technological and normative requirements and to develop the technological infrastructure to provide an interoperability layer for the cross-border exchange of judicial data and to allow access to cross-border e-Justice services.[6] As a result, e-CODEX project developed an **e-delivery infrastructure** that uses building blocks from previous EU

[4] http://www.e-codex.eu

[5] e-CODEX is funded through the ICT Policy Support Programme under the Competitiveness and Innovation Framework Programme (CIP).

[6] This e-delivery infrastructure may be adapted for more generalised use in the government sector within the Large Scale Pilot (LSP) called electronic Simplified European Networked services (e-SENS), aiming to deliver reusable and tested building blocks for the Connecting Europe Facility (CEF). The CEF project, funded by the European Commission, is devoted to stimulate and support projects of common interest for the deployment and operation of digital service infrastructures. For more information please see http://ec.europa.eu/digital-agenda/en/connecting-europe-facility.

EQPAM Volume 8 No.1 January 2019
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Large Scale Projects[7] to allow data and documents exchange, and the validation and cross-border recognition of electronic identities and electronic signatures in legal procedures (Velicogna, 2014; Velicogna et al. 2015). Furthermore, e-CODEX infrastructure provides for semantic interoperability, supporting the meaningful exchange of information between national systems. In other words, through semantic mapping and semantic transformation schemas, it ensures mutual interpretation of data exchanged between national electronic systems in cross border legal procedures.

In its latest year, the focus of the project shifted first toward 'testing' the functioning of the infrastructure between 'piloting' Member States, and afterwards to the experimentation of the infrastructure with actual procedures, the so called use cases, to increase the number of working use cases and the long-term sustainability of the solutions developed. By the end of the project 13 Member Statess were actively involved in the piloting of five cross-border procedures. (Velicogna et al. 2018:9).

4.1 e-CODEX Project Governance[8]

In e-CODEX, project tasks and competences are carried out by seven core work packages (WP) that cover technical, organisational, legal, policy and communication aspects. In particular, the work packages dealt with: overall project coordination and administration, communication with the potential stakeholders, high-level architecture, e-Signature and e-Identity, e-delivery, mapping and semantic, piloting.

Aside the mentioned work packages, two other bodies played a fundamental role in the project governance: a. Management Board, composed of the project coordinator and the WP leaders, and the General Assembly, composed of one representative per partner with each country having one vote.

During the project's activities the necessity of dealing with particular tasks and bringing together experts in specific fields brought about the creation of specific sub-groups and special ad hoc units. In particular, a Legal and Security Sub-Group (LSSG) was established in 2011. The LSSg was composed of legal experts from within the project but also from outside, with experience in EU and Member States' law. The group had the objective of mapping EU and national norms relevant for the project's aims and providing advise on legal matters related to cross border judicial procedures selected by e-CODEX. A Sustainability Task Force, composed by members of the Management Board and by other 'volunteers' was established in 2015 to coordinate the efforts aimed at supporting the sustainability of e-CODEX components, infrastructure and services after the end of the project.

4.2 e-CODEX Technological Infrastructure

The technological solution developed within the project is a result of an iterative and on-going process along which the various experts progressively defined, developed, tested and revised the system. Also, confronted with the complexity of the task, the development followed an use case oriented approach, starting from the analysis of the requirements the system had to satisfy to support the use cases that were initially identified and then progressively extended to cover additional requirements.

From a technological perspective, e-CODEX has been defined as a multilateral, content agnostic transportation infrastructure built to connect national and EU information systems. e-CODEX infrastructure receives, route and forward data, documents and evidences between heterogeneous systems providing an

[7] PEPPOL: e-procurement, epSOS: e-health, STORK: e-identity and SPOCS: e-business services. More information can be found here:
http://ec.europa.eu/information_society/newsroom/cf/document.cfm?action=display&doc_id=1250

[8] A previous version of the content of this chapter can be found in Velicogna, M. et al. (2014) *e-CODEX Deliverable D7.4 Architectural Hands on Material*. pp18-19

European Quarterly of Political Attitudes and Mentalities EQPAM
Volume 8, No.1, January 2019
ISSN 2285 – 4916
ISSN-L 2285 - 4916

interoperability layer which supports mutual understanding in the communication exercise. Furthermore, e-CODEX infrastructure is content agnostic, in the sense that the transport of data is independent from the format of the files being exchanged and from the business processes being supported. Finally, it is multilateral, in the sense that common standards are agreed by the partners to develop common solutions, instead of implementing bilateral arrangements. This creates the need for the maintenance of a higher number of solutions and agreements (Borsari et al., 2011; Velicogna, 2015).

e-CODEX solution is based on inter-gateway communication architecture developed from an open source b2b messaging software. The open source software has been extended to fit the e-CODEX needs to allow the mapping of the national formats to the widely used ebMS-based standard transport format used between e-CODEX access points (Gateways). Through this, e-CODEX ensures that the interconnection impacts the national systems as little as possible (e-CODEX, 2015).

Figure 1.
e-CODEX high-level architecture main components.

The function of e-CODEX technical infrastructure is not limited to the transportation of data and documents. To enable meaningful exchange of information between national systems, requires also semantic interoperability. Member States participating in the pilots have national e-justice solutions. Such solutions are typically based on domestic semantic structures. To support the exchange of semantic information, e-CODEX uses common document standards and semantics. Specific coding schemas used by national systems need to be transformed in order to be interpreted by other systems using different schemas. This transformation is better known as mapping. To this end, "e-CODEX has to and will provide the means to connect rightfully and meaningfully that data that is presented in a different format and may carry different interpretations within the Member States" (Francesconi et al., 2013).

Following a use-case centric modelling approach, for each use-case, with the support of national experts, e-CODEX has developed specifications which ensures mutually equal interpretation of data

EQPAM Volume 8 No.1 January 2019
ISSN 2285 – 4916
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exchanged between national electronic systems in cross border legal procedures. In practice, for being processed through e-CODEX, the national solutions need to be converted into basic 'European' semantic concepts. Member States are responsible for 'when', 'if' and 'how' the messages are transformed from European to national level and vice versa. The result is that the data being exchanged "is clearly and uniformly understood when exchanged through the e-CODEX infrastructure" (Francesconi et al., 2013).

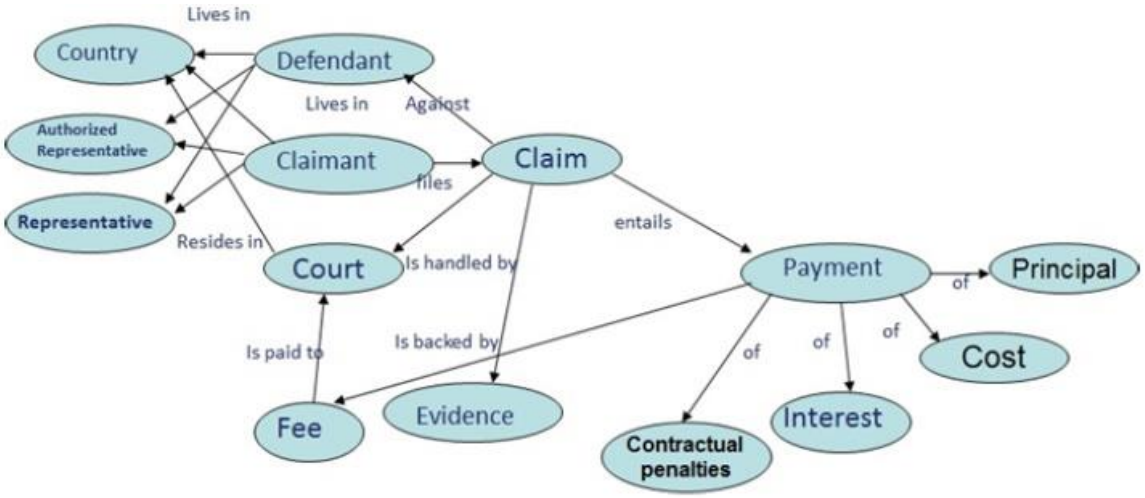

Figure 2.
Basic semantic concepts from European Small Claims Procedure [9]

In legal procedures, semantically meaningful data and documents exchange is not sufficient. Identification and expression of will are essential elements of legally valid communication and needs also to be supported. In the "physical world", identity and indication of intention are often shown through written signatures, identity documents and/or written mandates, which authorise persons or institutions to act on behalf of the party entitled to take part in the procedure (Contini and Mohr, 2014; Mohr and Contini, 2011). Moving to the digital world, electronic identities, electronic signatures and electronic mandates all exist in some form in different e-CODEX Member States. At the same time, the possibility to use them depends on national legal definitions and technical standards.

Dealing with such topics, and in line with its subsidiary stance, e-CODEX project decided to make national system interoperable cross-border through a mechanism of validation of the signature/identification that works at the level of the sender's e-CODEX interface, which creates a certification signed by the sending national authority (i.e. the Ministry of Justice of the sending MS). The receiving national authority then verifies the certification before re-routing the message to the receiver (e-CODEX, 2015). An e-CODEX agreement between Judicial authorities supports the legal validity of this procedure. This agreement also establishes the minimum level of operational and technical requirements the partners need to satisfy to be connected to the e-CODEX system and provide services through it. (Velicogna et al., 2014).

[9] e-CODEX (2015) "e-CODEX achievements, use cases and technical building blocks"

European Quarterly of Political Attitudes and Mentalities EQPAM
Volume 8, No.1, January 2019
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ISSN-L 2285 - 4916

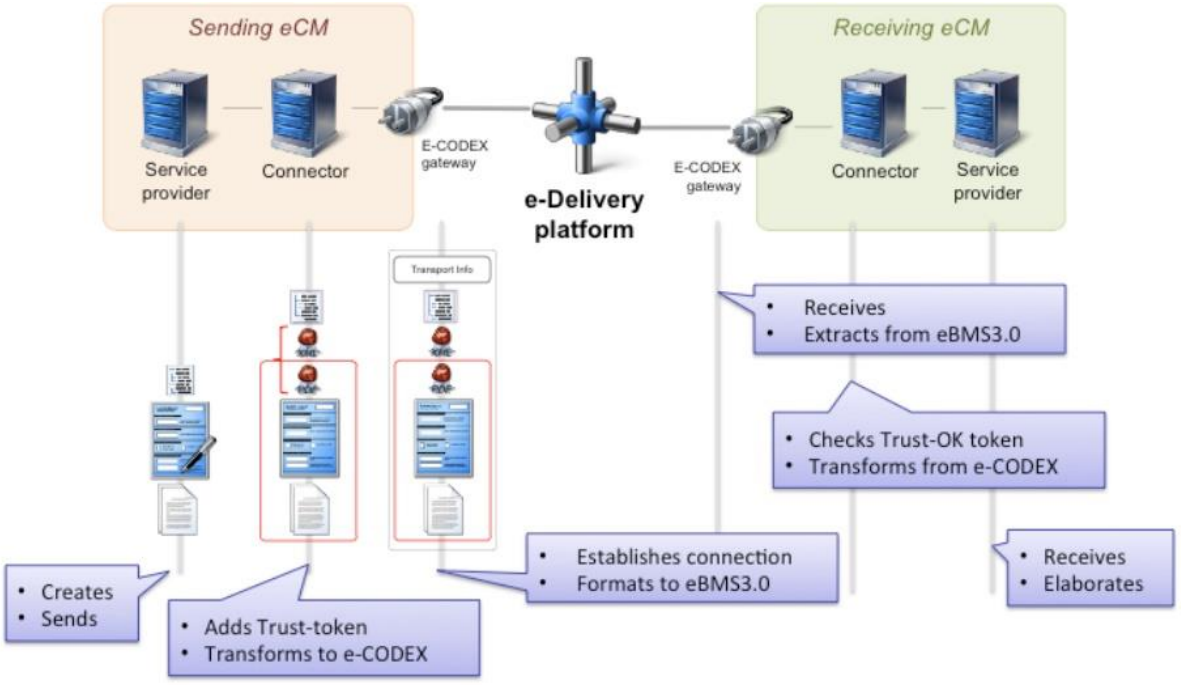

Figure 3.
e-Codex technological components

In addition to the technological components, e-CODEX infrastructure is also composed of organisations, rules and agreements that allow the actual provision of cross border judicial services. Being the legal domain, first of all, procedural rules (laws) are required. e-CODEX services follow cross-border judicial procedures based on EU Regulations and Decisions (e.g. European Payment Order, European Small Claim etc.). While these EU norms provide a certain level of standardisation, their functioning relies on national organisations (e.g. courts, bailiffs, tax agencies), procedures (e.g. notification, payment of fees), as well as technologies and specific frameworks (e.g. e-identification, e-signature etc.).

5. Discussion: Business Process Modelling in e-CODEX

In e-CODEX, the mapping of Business Processes and the translation of them into operative XML schemas has been carried on by the mapping and semantic work package team, lead by the Netherland Ministry of Justice and Security, with the support of Justid, the Netherland court administration agency. As previously introduced, e-CODEX team decided to utilize for business process mapping the ebXML specifications (Electronic Business using eXtensible Markup Language; see section 3) and the BPSS (Business Process Specification Schema) standard sponsored by the United Nations (UN/CEFACT)[10] and OASIS[11] for use in the field of e-business frameworks definition (Aissi, Malu and Srinivasan, 2002).

[10] The United Nations Centre for Trade Facilitation and Electronic Business (UN/CEFACT) is an intergovernmental body of the UNECE (United Nations Economic Commission for Europe) Committee on Trade, mandated to develop a program of work of global relevance to achieve improved worldwide coordination and cooperation in these areas.

EQPAM Volume 8 No.1 January 2019
ISSN 2285 – 4916
ISSN-L 2285 - 4916

As described in section 3, the choice to use the ebXML BPSS standard to map the business processes of each e-CODEX use-case was influenced by the particular focus that the standard has. Indeed, the BPSS has been principally created to define the business processes related to the exchange of documents between two different entities or more, while other schemas mainly address business processes at the internal of each organization (Lupo and Velicogna, 2015).

5.1 Mapping in e-CODEX: the different stages of business process analysis

In e-CODEX, the activities related to the draft of the BPM documentation, which comprise the definition of business transactions, have the objective of creating the starting point for the data analysis and the draft of XML schemas. A new XML schema is created successively to the use-case description through BPM, the check of existing building blocks for the mapping of information element requirements, and the creation of new information entities.

A core team of e-CODEX business process analysts has the responsibility of creating and defining concepts that will be part of the XML schema, on the basis of the information provided by the BPM documentation. Concepts created have to be approved by a semantic user council formed of representatives of all stakeholders before being included in the XML schema definitions (Biersteker et al. 2011; Velicogna et al., 2014; Borsari et al., 2013).

In order to draft a BPM document, e-CODEX business process analysts investigate the business processes involved in the exchange of documents of a particular use-case procedure, by looking for the support of business experts that can provide valuable input and information (Lupo and Velicogna, 2015). The analysis of a use-case is carried on in specific BPM mapping workshops in which subject matter experts selected by the e-CODEX partners are invited to participate to contribute to the definition of the specific business processes. The knowledge and experience gained from the regular handling of cross-border legal procedures is essential for defining business processes and digitalize them.

A key role in the study of a business process is played by the relevant EU legal framework and in particular by the EU legal instrument defining and regulating the procedure (Lupo and Velicogna, 2015; Moelker, 2015). A preliminary analysis of the legal instrument is carried out by the business process analysts so that the activities carried out within the workshop can use it as a basis. The participants to the workshop take into account not only national regulations but also practical aspects of the implementation of EU norms in the different Member States. For this reason, mapping workshops have to involve key experts on the domestic processes. At the same time, the process analysis in e-CODEX, focuses on the cross-border interactions, in order not to interfere (as much as possible) with domestic business solutions (Velicogna et al. 2014). As we will see later, this choice did not allow to focus on important organizative and legal issues that affect the EU procedures digitalized in e-CODEX, and that mainly derive from the practical application of EU procedures in Member States.

The business process analysis consists of several steps (Borsari et al., 2013; Velicogna et al. 2014). First, a preliminary contextual description of business processes is drafted. This step in particular involves the description of the context of the legal procedure and the identification of experts on the cross border legal procedure that participate in e-CODEX. The first step, therefore, defines the generic scope of the process and describes it in a graphical representation. In fig. 4, the outcome of the scoping process analysis for the European Small Claim Procedure use-case is shown.

[11] OASIS is a non profit consortium that works on the development, convergence and adoption of open standards for the information society. The OASIS standard are applied in the following fields: security, Internet of Things, cloud computing, energy, content technologies, emergency management, and other areas (www.oasis-open.org).

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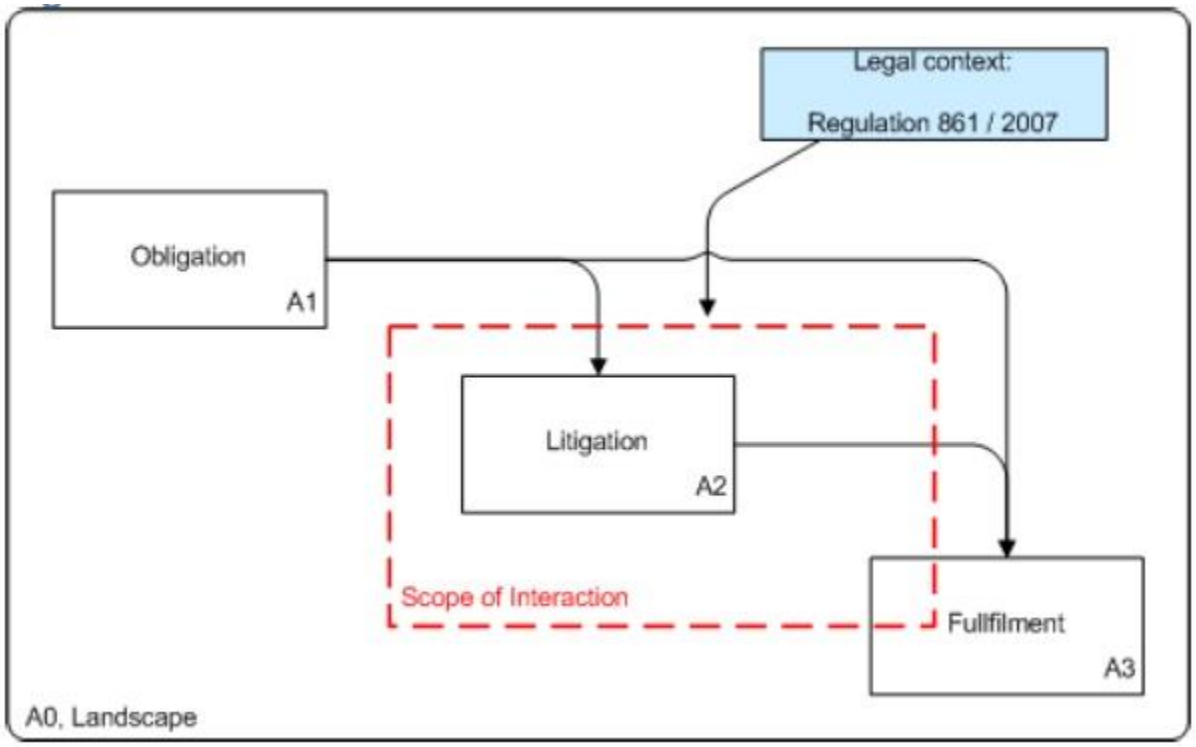

Figure 4.
International business transactions for ESCP

The second step regards the definition of Business Collaborations. The Business Collaborations describe in detail all the process steps that compose the procedure in a unique document (see fig. 4). The Business Collaborations document describes a set of Business Transactions that represent the transactions between the actors involved in the procedure (for example user and service provider).

The definition of Business Transactions is the third step of the BPM process analysis. Transactions, in particular, regard the exchange of information or of specific documents. In the fourth step, the Business Transactions are modelled into Business Documents that define which information or documents are exchanged.

The BPM analysis, when completed, becomes the basis for the semantic (XML schema creation) and infrastructural activities (development of building blocks; see chapter 4). After the draft of the BPM document, this passes different stages of iteration, until it is finally approved by the WP6 and the stakeholders involved in the business process analysis.

In the next pages, we briefly introduce the business process analysis of the EPO use-case and all the steps involved in the procedure from the filing of a claim by a claimant to the transactions between the claimant, the court and the defendant.

EQPAM Volume 8 No.1 January 2019
ISSN 2285 – 4916
ISSN-L 2285 - 4916

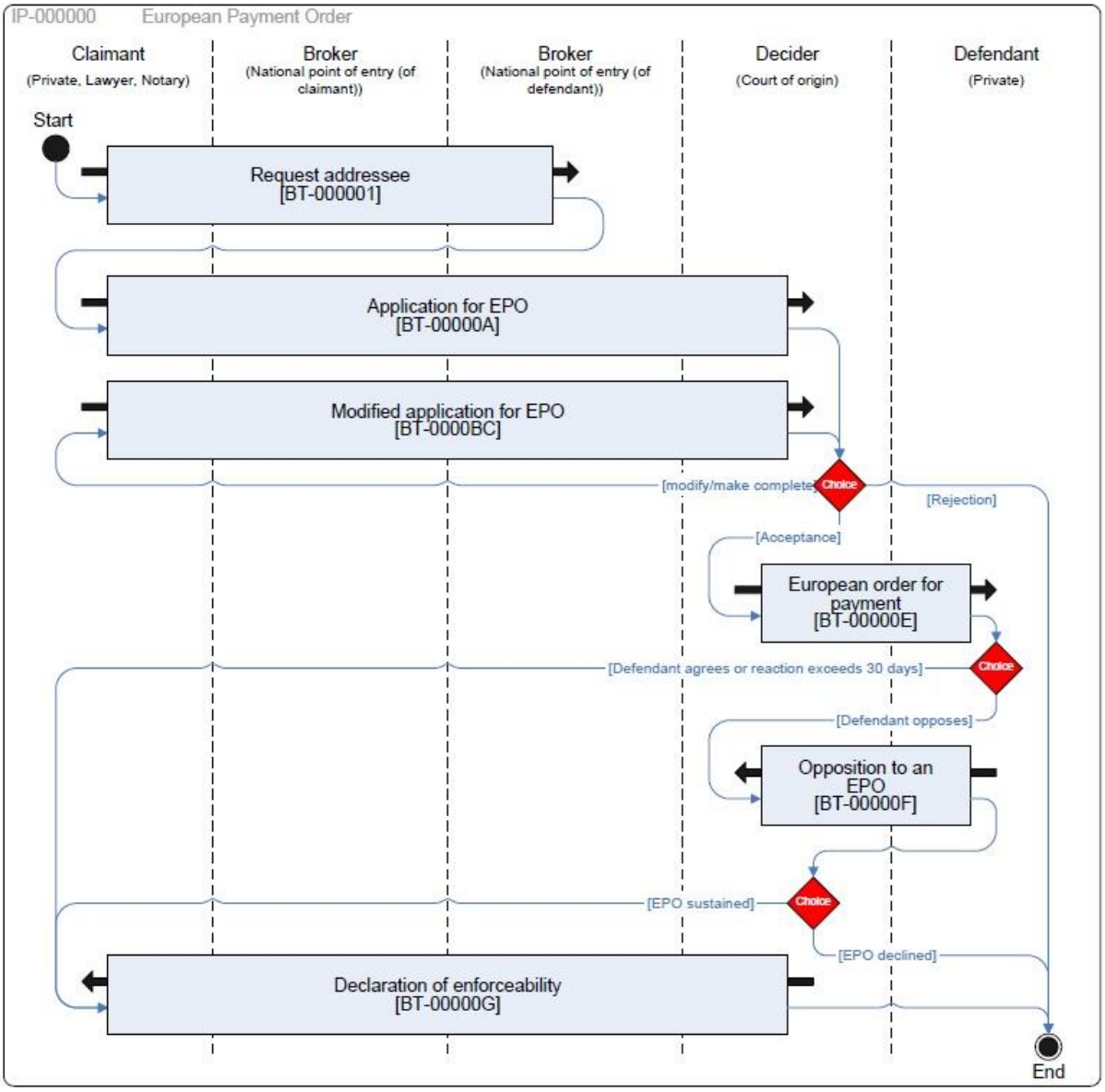

Figure 5.
Business Collaboration for the EPO use-case (from Borsari et al., 2013).

5.2 A Mapping example: the EPO Business Processes

The initial mapping of the European Payment Order business processes and the draft of the BPM document were carried out by e-CODEX team in 2012. The BPM documentation was drafted on the basis of the results that came out from specific EPO BPM workshops (Borsari et al. 2013; Lupo and Velicogna, 2015). The workshops saw the involvement of the mapping and semantic WP leaders, a team of BPM experts and experts of the judicial procedure (representing countries and institutions that were partners in e-CODEX). The EPO regulation provided for six forms that should be utilized in order to pursue specific steps of the procedure (Council Regulation 1896/2006; EU Commission, 2015). The workshops were

ISSN 2285 – 4916
ISSN-L 2285 - 4916

preceded by a preliminary analysis of the Council Regulation 1896/2006, which establishes the EPO procedure. BPM experts carried on the analysis of the procedure that was then utilized as a guide during the BPM workshops.

As mentioned, the mapping of XML schemas and therefore the digitalization of forms is based on the BPM documentation. The BPM documentation of the EPO use-case has been drafted following the four steps of business process analysis described in section 5.1.

First, the scope of the EPO business process analysis has been defined. The scope of e-CODEX' EPO use-case covers from the start of the procedure that happens when there is disagreement over the respective obligations of two parties, to the end of procedure, when a court ruling has taken place in order to solve the dispute between the parties. The enforcement procedure that may be activated if the ruling is in favour of the claimant, is out of e-CODEX scope because it is governed by the law of the Member States (Borsari et al., 2013).

Second, the Business Collaborations (step 2) have been defined. The Business Collaborations document describes the process steps that compose the EPO procedure (see **Figure 4**).

Third, each step of the Business Collaboration document has been defined as a business transaction. The Business Transaction focuses on the exchange of messages and documents between the actors involved in the EPO procedure. The following transactions have been defined: a) Request addressee; b) Application for EPO; c) Prepayment; d) Authentication of the claimant; e) Reception at the court; f) Modified application for EPO; g) Receiving and processing the claim; h) Service on defendant; i) Opposition to an EPO; l) Service of the decision; m) Declaration of enforceability; n) EPO Summary process steps. The BPM analysis defined also the business documents that are involved in the procedure. An important element simplifying the mapping of the EPO procedure is that it provides a set of Forms to the parties involved in the communication exchange between the parties and the court. [12] At the same time, discussion between the EPO experts on e-CODEX modelling workshop showed that, due to national specificities, further communication messages needed to be foreseen. As an example, in the Italian case, nine additional communications needed to be supported to allow the proper functioning of the procedure (Velicogna 2015:12).

The business process analysis was then used as a basis for the definition of the EPO use-case functional requirements. This documentation defines which are the requirements of the designed infrastructure for both external users and internal, as judges and court staff. Requirements for EPO use-

[12] The first form, "Form A" has to be filled out by the claimant in order to file a payment order to a European court. "Form B" is utilized by the court in order to communicate to the claimant if the form is not complete (as for instance if a prepayment is required and bank details are not given, or additional supporting documents are needed). "Form C", is utilized by the court, in case of modification of the payment order, in order to invite the claimant to accept or refuse a proposal for an EPO, for the amount specified by the court. "Form D" has to be used by the court and sent to the claimant in order to inform him or her, if the claim is dismissed. "Form E" is issued by the court and it reminds the defendant of his rights and options: either to pay to the claimant the amount indicated in the order or to oppose the order by lodging with the court of origin a statement of opposition. The form also informs the defendant that the order will become enforceable, unless a statement of opposition is lodged and that in case of opposition, the proceeding will continue before the competent courts of the Member State of origin on the ground of national civil procedure. The Council Regulation 1896/2006 does not discipline strictly the matter of service of documents to the defendant and this results in a heterogeneity of methods for notification. As acknowledged in a specific study carried out by e-CODEX in the topic, the methods for service of documents to defendant varies between EU countries, above all in terms of who has the responsibility of notification, the court or the claimant (Velicogna, Lupo and Ontanu, 2015).
"Form F" has to be filled out by the defendant in order to lodge a statement of opposition to the payment order in accordance to article 16 of the Council Regulation 1896/2006. The statement of opposition should be sent within 30 days of service of the order on the defendant.

EQPAM Volume 8 No.1 January 2019
ISSN 2285 – 4916
ISSN-L 2285 - 4916

case refer for example to the possibility for plaintif to find and fill out Form A - Application for a European order for payment or for the court staff, or to have a unique case number that associates the claim to the correct case. The national solution or the e-Justice Portal should allow users to save data for a certain period of time in order to allow for the re-filing of the forms. Not all requirements have been implemented. As an example, user requirements addressed e-payment of court fees, but e-payment functions were left out from the technological solutions adopted in e-CODEX.

The digitalization of the EPO procedure brought to the creation of the XML version of the human readable forms (pdf). Both versions (human readable) and XML are then utilized in e-CODEX and sent through the system. As mentioned in section 3, the e-CODEX infrastructure allows the translation of digital documents from national standards to the e-CODEX standards and vice versa through mapping. This in order to avoid modifications of already implemented national systems. Therefore, EPO forms have been translated both in national XML format (under the responsibility of each piloting countries) and in e-CODEX XML format (under e-CODEX partners' responsibility; e-CODEX XML format respects the ebMS and ETSI REM[13] standards). Despite it is not within e-CODEX responsibility, e-CODEX facilitates the 'national data mapping' through mapping workshops (Velicogna et al. 2014). BPM analysis, the mapping of XML schemas and the relative digitalization of forms, preceded the activation of the pilot phase that saw the involvement of 5 countries and the connection of their national solutions to the e-CODEX infrastructure.

5.3 The e-CODEX EPO pilot

The piloting stage of the e-CODEX project has been carried on in two waves. The first wave, saw the involvement of five (Austria, Greece, Germany, Estonia, and Italy) e-CODEX partners that activated the pilot phase of the e-CODEX use case for EPOs in different modalities (Velicogna 2015, Carboni and Velicogna, 2012; Lupo and Bailey, 2014).

The mentioned European countries joined the pilot stage by installing a National e- CODEX access point. As previously mentioned, National e-CODEX access points are the components of the e-CODEX infrastructure that allow for the secure and reliable transport of judicial documents, provide for the translation from national to e-CODEX standards and *vice versa*, and apply the trust-ok token that indicates the results of signature verification and validation. Aside e-CODEX components, piloting countries had to connect an already existing service provider or develop a new one (Borsari et al. 2011 (2)).

The service provider allows the access to the service and to the EPO forms in particular, both to the external users (citizens and/or lawyers) and to judges and court staff. On the one hand, national lawyers and/or citizens may access to the national service or to the European e-Justice portal to fill out the EPO form, for filing a claim or an opposition (in case of a defendant). On the other hand, the service provider is accessed by judges and court staff to manage the incoming forms (as the Form A, sent by a claimant in order to file a request for a European possession order) and to fill out and send EPO forms to the parties.

The connection of the national service provider to the e-CODEX infrastructure foresees also the mapping of EPO forms in the national standard format. In the Italian case, for example, the Italian Trial Online (in Italian, Processo Civile Telematico; Carnevali and Resca, 2013; Carnevali, 2010, 2006; Borsari and Baratta, 2004) has been connected to the e-CODEX system. Moreover in the Austrian case, the ERV

[13] The Message Service Specification (ebMS) describes a communication-neutral mechanism for the exchange of business documents. It is a standard defined and circulated by the OASIS international open standards consortium. The ETSI-REM is a standard that regulates the implementation of evidences regarding messages and documents exchanged and the electronic signatures.

ISSN 2285 – 4916
ISSN-L 2285 - 4916

(Elektronischer Rechtsverkehr; Koch and Bernoider, 2014) has been connected as service provider in the e-CODEX pilot for the EPO.

Before going live, the installed components have to pass a testing phase. The test of the developed national components and of the connections between piloting countries follows a specific procedure and timeline that has been set up by the working package responsible for piloting (Borsari, 2011 (1)(2)). Piloting countries are also responsible of the tests on the national components interfacing with e-CODEX access points. (Hvillum et al., 2012). These tests focus on the exchange of EPO forms from one end to the other, that is, from a national service provider (for instance, the Austrian ERV) to a second piloting country's service provider (as the Italian TOL). All the exchanges of EPO forms that are in the scope of the e-CODEX project are tested by all the piloting countries utilizing mock cases in a test environment (Borsari et al., 2011 (2)).

The successful conclusion of the test phase is followed by the going live of the pilot. At this stage, real users (citizens, lawyers, court staff and judges) are involved in utilizing the system with real cases. As mentioned, the piloting countries activated the "go-live" pilot phase in different ways. In Austria, the national e-filing system was connected to e-CODEX allowing Austrian claimants to send EPO claims while the connection of the competent court only took place during a follow up project (Pro-CODEX). Greece activated a court which deals with about 50% of incoming EPOs and developed a system to allow lawyers to file cases. In Germany, a single national court (the Wedding District Court) also processes all EPO cases incoming from European citizens, but Germany can only receive EPO cases through e-CODEX. The system is not available for German citizens or lawyers who want to send an EPO claim to a court in another piloting country (Carboni and Velicogna, 2012; Lupo and Bailey, 2014). Estonia developed an interface connected to e-CODEX, which allowed citizens to file EPO claims to piloting countries' courts based on the use the already existing national electronic signature infrastructure (Carboni and Velicogna, 2012; Lupo and Bailey, 2014).

In Italy, only the First Instance Court of general jurisdiction of Milan was connected to the e-CODEX system through TOL's infrastructure for judges and court staff. Unlike Germany, the Court of Milan can only process incoming claims over which the first instance court of general jurisdiction of Milan is competent. It should be noted that the modifications introduced in the Italian court ICT system could be activated in all first instance courts, but the Ministry of Justice decided to carry on the pilot on a limited scale to better understand the potential legal and organizational problems before making the service available nationwide.

The different implementation of the technological innovation fostered different conditions between users in the different piloting countries. This brought also different results in terms of number of cases that have been filed through the e-CODEX system. On the case of Austria and Germany, for instance, geographical proximity, shared language, similar national procedural rules resulted in a much higher number of cases than Estonia, Greece and Italy. This result acknowledges the clear existence of important commercial relations between the two countries and the obvious absence of semantic barriers (in both countries the official language is German). Moreover, even before e-CODEX, the Austrian and German system was already used to exchange and send trans-border payment orders. On the other hand, as an example, the cases sent through the Austrian service provider to the Italian system are very few (only four). It is probable that with the implementation of the e-Justice portal as an e-CODEX service provider, accessible by all the European citizens through the web, the number of EPO cases filed in e-CODEX will raise. However, it is worth saying that an improved accessibility of the e-CODEX technology to European citizens may not positively affect the diffusion of the procedure as several of the favourable elements to the use of the procedure are not affected by the technology. Most of the issues previously mentioned regard

EQPAM Volume 8 No.1 January 2019
ISSN 2285 – 4916
ISSN-L 2285 - 4916

the different national application of the European Regulation on European Order for Payments and the lack of information for potential users. Those are factors that have not been fully addressed by the preliminary business analysis due to the need, on the one hand, to preserve national technological peculiarities and to the impossibility, in the other hand, to support an amendment of the European Regulations. It is in the scope of this paper and in particular of the next section, to investigate on the issues of the EPO procedure that have not been addressed by e-CODEX, and that may hinder the overall performativity of the system with reference to the EPO use case.

6. EPO Use Case: Why Is It Not Broadly Used?

While developing a technically functioning infrastructure which supported legally valid communication exchanges, e-CODEX BPM approach failed to develop broadly used services. The reasons behind this are many. Several contributions (Kramer, 2010; Ng, 2013; Mellone, 2013; Ng, 2014; Mellone, 2014; Lupo and Bailey, 2014) that analysed the EPO procedure highlighted the issues that limit the accessibility of the procedure for external users (both citizens and lawyers). The European Payment Order applies on cross-border cases and can be utilized by creditors that need to recover their uncontested civil and commercial claims by following a uniform procedure based on the compilation of standard forms (EU Commission, 2012). The Regulation applies between all Member States of the European Union with the exception of Denmark.

The procedure is clearly an attempt to simplify access to justice in cross-border judicial proceedings. For example, the procedure does not require the presence of the parties or their representatives before the court. The claimant only has to submit his application, after which the procedure will lead its own life. It does not require any further formalities or intervention on the part of the claimant. Only in case of defendant's opposition, and if the claimant has expressed the intention to go on in case of opposition, the case follows national civil procedure and proceeds with an hearing (Mellone, 2013). In practice, the procedure has the scope of simplifying, speeding up and reducing costs of litigation in cross-border cases and improve accessibility also for self-represented claimants (Mellone, 2014). As it will be shown below, the accessibility of cross-border procedures for debt collection through the introduction of EPO, did not improve enough due to complexities not addressed by the European procedure.

At the present, there are very few works or reports on the practical application of the EPO procedure. However, few field research and analysis (Ng, 2013; Mellone, 2013; Ng, 2014; Mellone, 2014) identified several barriers affecting diverse steps of the procedure. In particular, a recent work (NG, 2013) highlighted the main complexities of the procedure by conducting a simulated filing of an EPO claim from the UK to an Italian court office. The main issues encountered during the investigation, regarded the preliminary activities that a claimant should carry on before filing the claim, the filling up of the forms and the communication with the court and the defendant.

As a **preliminary step**, a claimant who is considering filing an EPO against a foreign defendant has to identify the defendant's attackable assets in order to be sure to collect the debt in case of enforcement. The identification of the attackable assets is not an easy task for a foreign citizen and it also involves issues of privacy. A creditor would probably need to involve a lawyer or to obtain a court order in order to investigate on the debtor's assets, depending on the national law applicable (NG, 2013; NG, 2014).

After deciding to proceed, in order to **fill the claim** (Form A), the claimant has to identify the court that has jurisdiction to decide on the case. Generically, the EPO procedure states that the court seized is the one of the defendant. However, in cases in which jurisdiction is spread across a number of local courts, as in the Italian case, the competence is disciplined by national law and this raises the complexity of

ISSN 2285 – 4916
ISSN-L 2285 - 4916

procedure. In this case, the selection of the correct court is not a simple activity, not only for a lay user, but also for a lawyer that does not have a perfect knowledge of the law of Member State in which resides the competent court (NG, 2013; Lupo and Bailey, 2014).

Further difficulties regard the identification of defendant's representative. In the EPO Form A, a field is dedicated to the code number that identifies the defendant's representative. However, the identification of this code number is not easy for a lay user or a lawyer.

A further complexity is associated to the calculation of interests to be added on the amount requested to the debtor. The complexity relies on the application of the applicable national law and interest rate. This issue represents a considerable barrier for the access of a lay user to the procedure that may have great difficulties in calculating interest rates without the support of a professional (lawyer/banker; NG, 2013; NG, 2014).

A semantic issue regards the evidences in support of the claim to be provided in the Form A. A field in the form is dedicated to the description of the claim and of the evidences in support of the claim. The language accepted by the court may vary from country to country, but it is usually the Member States' official language. In the case of Italian courts, the language accepted is Italian. Therefore a claimant, if not supported by an Italian lawyer may have difficulties in filling up this part of the form, especially where legal jargon is requested to properly present the case.

Another difficulty is the calculation and payment of the **court fees,** although this problem was addressed by a revision in the EPO regulation and improving the information available on the European e-Justice Portal. It should be noted that e-CODEX solution developed for the EPO procedure did not address e-payment and therefore it did not provide a uniform solution for the payment of court fees. This further limits the incentive to use the system.

Once the claim is filed by post to a European court, at least from what stated by the EPO procedure, the claim should take a life of its own. However, the claim filed to a court need to be served to the defendant. The issue of **service of documents** may represent a further barrier to the access of the procedure (Velicogna, Lupo, Ontanu, 2015). This in particular because the EPO regulation does not strictly discipline the rules for the service of judicial documents to a defendant, but defers it to national procedures. A recent study (Velicogna, Lupo, Ontanu, 2015) demonstrated that in terms of methods of notification in EPO cases, member states usually apply the rules that discipline the national payment orders. European Member States therefore divide between those countries in which courts automatically deliver the claim's documentation to the defendant and those countries in which the claimant has the responsibility of notifying to the defendant. If a citizen files a claim to a court in a Member State in which the claimant is responsible for notification, the complexities associated to the filing of a possession order raise exponentially. This issue is clear in the Italian case (2013; 2014). In the Italian case, the claimant is responsible for notification. The claimant has to request a true copy (in Italian "*copia conforme"*) of the claim to the court and to request the service through the Italian judiciary service Authority ("ufficiale giudiziario") within the deadline of 30 days. Further complexity derives from the fact that these activities normally entail the physical presence of the creditor or of a person acting on his/her behalf and the payment of further court fees. It is worth saying that the issue that mainly affect the complexity related to notification is the absence of information on the methods of judicial documents' delivery foreseen in each Member State. A claimant is therefore unaware of the difficulties related to the delivery of documents that he or she may encounter only after the claim has been filed.

A further complexity may regard the statement of defendant's opposition that should be served to the claimant. This document advices the claimant that the defendant made an opposition to the payment order

EQPAM Volume 8 No.1 January 2019
ISSN 2285 – 4916
ISSN-L 2285 - 4916

and that the procedure will follow national civil laws. The document may be written in the language of the seized court and therefore hard to read and interpret.

Another complexity regards the **issuing of the payment order**. While in some Countries the court proceed to the issuing of the payment order, in other cases, a request from the claimant (and the potential payment of additional fees) is required.

It is not difficult to see how many of the complexities related to the EPO procedure are not solved by the availability of a technological infrastructure supporting the procedure, as e-CODEX. However, as the attention of the project shifted toward long term sustainability, which is linked to the use of the system, these elements raised in relevance and start to be discussed in search of alternatives and solutions. This brings up the following points: on the one hand, it is difficult to map ex ante the complexity of carrying out a legal procedure, even with the involvement of experts with practical experience, especially in a cross-border setting; on the other hand, the use of BPM as a recursive process in which further analysis and discussion follow live pilot experimentation and address limits and problems emerging with the practical use, may provide a way to navigate the complexity of developing and implementing an information infrastructure and providing judicial services through it. In this perspective, the BPM analysis phase(s) should be considered an important occasion in which developers may focus on the issues related to the practical application of the procedure. In the next section, we will finally discuss the important lessons learned from the analysis of e-CODEX design and implementation in terms of use of BPM strategies and resulted legal and technological performativity.

7. Concluding Remarks

This article acknowledges the positive results achieved through BPM analysis as a preliminary activity for the development of e-justice services. At the same time, the e-CODEX case exposes the difficulties designers face in grasping and addressing the complexities of cross-border e-justice development. We investigated the features of a large scale infrastructure supporting judicial communication between parties involved in cross border judicial proceedings and some of the main efforts made to develop it. It is of course not possible to provide a full description of the technical, legal, organizational and institutional features of the very complex system which has been developed and assembled building on a large number of existing national and supranational components, capabilities, practices. What we tried to do here is to provide a sense of such complexity and of the non-linear dynamics which characterize the development and growth of such systems also with a longitudinal perspective. This is consistent with the fact that large-scale systems and information infrastructures “are not designed from scratch as in a green field situation (Hanseth and Lyytinen, 2010) but rather one must design at the same time with and against the installed base (Hanseth, 2000)” (Grisot and Vassilakopoulou, 2015). Moreover, the case we presented is particularly interesting for several reasons including the organizational and political challenges posed by its large supranational dimension and the specificities of the justice domain, which is typically a highly regulated environment (Cordella and Contini, 2012; Velicogna 2007a, 2007b). An environment where, in addition to managerial, economic and public service values, other key values such as judicial independence must also be taken into account (Contini and Mohr, 2007;Velicogna and Ng, 2006; Velicogna, 2008; Lupo, 2013, 2015).

As indicated in the paper, the non-linear trajectory of the development is related to the need to build on an existing, geographically heterogeneous and multi-layered techno-legal installed base that needs to be explored and discovered in the development process (Velicogna and Contini, 2009). The analysis of business processes through BPM represents a valuable method for the exploration of the installed base.

ISSN 2285 – 4916
ISSN-L 2285 - 4916

However, some aspects that are considered out of scope in the beginning (for instance the different practical application of the EPO Regulation in different Member States), may become important when the project goes live and when the issues related to these aspects are identified.

The non-linear trajectory is also related to the need to develop something which is not just technically functional, but also legally performative. As mentioned, the question of legal performativity, while implicitly considered since the beginning, becomes more central to the development discussion as the actors become more aware of the practical impact of different national legal frameworks. The issue of legal performativity should be taken into account since the beginning of business process analysis and during all stages of e-justice development. This may represent a further complexity for BPM techniques that have been specifically designed in contexts very different from the justice one. At the same time, the relevance of national and supranational legal frameworks is increasing as a result of the growingly delocalized functioning of organizations and of the mobility of people and businesses. Analysts need to carefully take into account this aspect for instance by involving legal experts and stakeholders that are aware of the issues. Furthermore, they need to be aware that le legal framework evolves over time. The EU GDPR regulation has clearly shown the impact that a legal instrument can have on e-services and their organization on a global scale.

A further reason of this non-linear trajectory is that, with the increasing maturity of the project, after the system starts functioning on the first live EPO cases and it is been extended to a growing number of piloting countries and expanded to new procedures, we assist to a shift in the objectives of the project from the developing of a technically working and legally performative infrastructure to the reaching of a critical mass of users and to the support of long term sustainability. This implies a revision in the way the infrastructure is conceived and assessed, and also in the strategies of the project partners. In relation to piloting, we are now assisting for example on a move from a use case centric perspective to a more user centric one, in which it is not just relevant if the system works well, but also if it is utilized by a sufficiently high number of users users. Things that were previously out of the scope of the project are now receiving its attention and actions. This means, on the one hand, that analysts and designers should take into account, since the beginning, the project's possible evolution (for the concept of e-justice evolvability please see Hanseth and Lyitinen, 2011; Lupo, 2013; Lupo and Bailey, 2014); on the other hand, that the BPM analysis, the successive schema drafting and the design of the project have to be considered "open" processes that need to adapt to the changes in project's goals and necessities.

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