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# A Great Success that Was on the Brink of Failure: The Case of a Techno-Legal Assemblage in the "Civil Trial On-Line" System in Italy

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**Abstract**

In the last twenty years, Italy has made massive investments in ICT projects in an attempt to improve the 'quality of justice'. 'More technology' was considered the mantra policy to save justice from a never-ending state of crisis. These huge investments resulted in a highly sophisticated e-justice system, with full dematerialization of the civil justice procedures. However, this success did not take place automatically and without costs, as initially expected.

**Keywords**: e-justice system



## 1. Introduction

In the last twenty years, Italy has made massive investments in ICT projects in an attempt to improve the 'quality of justice'. 'More technology' was considered the mantra policy to save justice from a never-ending state of crisis. These huge investments resulted in a highly sophisticated e-justice system, with full dematerialization of the civil justice procedures. However, this success did not take place automatically and without costs, as initially expected. For quite some time, IT applications were considered as "plug n' play

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tools"[1] to place in the existing judicial environment, losing in this way much of their potential for change and resulting in limited uptake[2].

Permanent results in the adoption of new technology are very demanding processes, not linear and very costly, especially at the beginning. The situation gets worse when the complexity increases, such as in the development of e-justice. What is at stake is not just the introduction of end users applications or tools, but implies the development of large scale platforms connecting multiple actors, requiring more technical specifications, more rules, more organizations and institutions involved, more interoperability needs, etc. It is a process that affects existing structures, procedures, working practices, judicial culture, rituals, and involve not just the core organizations but also their environment (institutions, organizations, judges, court staff, court users, etc.). This complexity cannot be easily governed. Research on the development of such systems suggests that the main actors involved should "cultivate"[3] the innovation in day-by-day operations, according to an incremental approach[4]. Another important factor of the success of a good ICT adoption is the achievement of a "critical mass" of users. "As the number of users grows, technology tends to get momentum, and it starts growing through a 'self-reinforcing' process"[5]. In the Italian case, this essential flywheel of innovation was a mix of pressure of practitioners associations at the beginning and the enforcement of the law at the end.

In this regard, the paper explores the Italian e-justice experience of the development of the so-called *Processo Civile Telematico* (acronym PCT, that has been translated into "Civil Trial On-Line"). The Civil Trial On-Line (CTOL) project[6] is the most important e-Government plan in Italy, not only in Justice. Developed by the IT Department of the Ministry of Justice since 2001, it aims to increase the availability of online services throughout a two-way data and document interchange communication system. It provides applications to allow interoperability among a considerable number and variety of external users (lawyers, experts, public administrations officials, citizens, private companies executives, etc.), and courts' internal users (judges, clerks, etc.) involved in civil cases, using a high-security PKI architecture with up-to-date technical features compliant with specific legal provisions and general legislation on the matter[7].

CTOL collected the highest investment of resources ever seen before in Italy, and it was the project on which the highest hope to overcome the chronic crisis of civil justice was posed. However, the current undeniable success of the system has gone for several years through a real risk of failure, because of the difficulty of handling the extreme complexity of the system, in which the problem of mediation between law and technology is still there. The next pages explore this experience, first describing the system and then attempting to show some of the complex and intertwining dynamics of its legal and technological development.

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[1] Velicogna, M. (2007). Justice systems and ICT-What can be learned from Europe. *Utrecht L. Rev.*, *3*, 129. Fabri, M. (2009) E-justice in Finland and in Italy: Enabling versus Constraining Models. In *ICT and Innovation in Public Sector. European Studies in the Making of e-Government*. Ed. F. Contini and G.F. Lanzara. Basingstoke: Palgrave Macmillan.

[2] Contini, F. and A. Cordella (2007) Information System and Information Infrastructure Deployment: the Challenge of the Italian e-Justice Approach. *The Electronic Journal of e-Government, 5(1)*.

[3] Dahlbom, B. and L. Mathiassen (1993) *Computers in Context. The Philosophy and Practice of Systems Design*. Cambridge, MA, Blackwell Publishers.

[4] Fabri, M. (2009) Op.cit.

[5] Hanseth, O. and M. Aanestad (2003) Design as Bootstrapping Networks: On the Evolution o ICT Networks in Health Care. *Methods of Information in Medi*cine, 42.

[6] The right word to be used is "procedures" instead of the word "trial": the current name given to the project

[7] Carnevali, D. and A. Resca (2014) Pushing at the edge the Maximum Manageable Complexity: The Case of "Trial on Line" in Italy. In *The Circulation of Agency in e-Justice. Interoperability and Infrastrutures for European Transborder Judicial proceedins*. Ed. F. Contini and G.F. Lanzara. Springer.

**EQPAM Volume 8 No.2 April 2019**
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## 2. The System

The Civil Trial On-Line (CTOL) operates as a full e-filing system, intended to provide complete electronic management of all civil proceedings from case filing to disposition, electronic notification, and communication to and from the court. The system even provides public access (with some restrictions) to the data collected in the databases of court management systems and any payments of court fees. As mentioned in the introduction, the system basically enable interoperability between authorized users outside the courts (lawyers, experts, public administrations officials, citizens, private companies executives, etc.) and authorized users inside the Courts (judges, clerks, etc.), through a high-secure infrastructure which ensures reliability of transmissions, authenticity, integrity, non-repudiation and confidentiality[8].

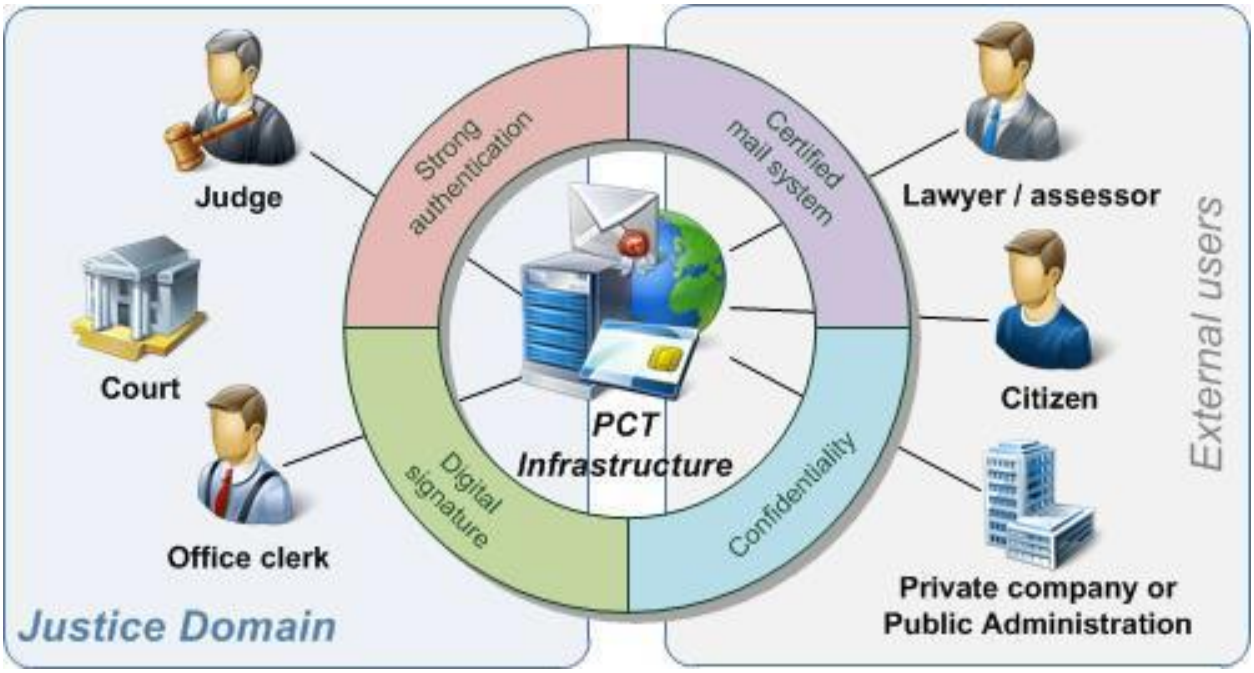


**Figure 1** .
The main abstract view of the actors involved and the main features of the infrastructure (Ministry of Justice, IT Dept. 2016)

## 3. Rules and Technology

The CTOL system provides two kinds of services based on an asynchronous and synchronous mode of communications[9].

According to technical rules and the general legislation on the matter, the **asynchronous mode of communications** delivers the transmission of legal acts (e-filing) and official communications and notifications, adopting the so-called "Posta Elettronica Certificata" (acronym PEC) channel, the Italian "certified e-mail", and a digital signature for authentication of documents and for accessing the system. The system provides that every PEC message receive an official receipt to ensure certainty in the delivery with

[8] Carnevali, D. and A. Resca (2014) Op. cit.
[9] Ministry of Justice, IT Department (2016) *The e-Justice in Italy: the "On-line Civil Trial"*. Internal document.

ISSN 2285 – 4916
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a timestamp. For confirming authenticity, non-repudiation, and integrity, PEC messages and receipts are digitally signed by providers of senders and recipients.

The Italian ICT authority (AgID) licenses the PEC providers that can operate in the justice sector, ensuring the respect of the rules, especially on the security side. These PEC addresses are stored in an Electronic Address Book available to the courts.

External users file a legal act, using an encrypted S-MIME envelope attached to the PEC message. The envelope encloses the legal act in PDF format, digitally signed by the author, an XML file providing structured information of the legal act, also digitally signed, and all other documents that need to be attached to the legal act. The official time of delivery to the court is the timestamp of the PEC delivery receipt, which is sent back to the sender.

Once received by the court, the PEC message and its content are automatically saved, decrypted and checked by the system. An automatic PEC reply is sent back to the sender with the result of these checks. In case of a positive result, the content is provided to the office clerk, who proceeds to analyse the document and give the official delivery approval and (automatically) update the Court Case Management System (CMS). A final PEC message is sent back to the sender, with the result of the clerk check. At this point, the files become available for all parties authorised in the proceeding for handling the case.

A PEC message is sent also when communication has to be made from the court to the external users (lawyers, experts, officers, etc.). In this case, the message is automatically prepared and sent by the CMS after operating a specific procedural event. Once submitted, the system automatically saves the PEC receipts from the provider and stores them and warning the office clerk in case of delivery failure. In this case, the PEC system tries to deliver the message within 24 hours.

Finally, the CTOL system is connected to the e-CODEX platform to enable cross-border transmissions in case of cross-border proceedings (European payment order or small claim at the moment). This feature is available but tested only by the court of Milan (since 2013)[10] and by the experimenting lawyers of four bar associations since 2018.[11] A case file coming from another country through the e-CODEX platform is checked automatically and transformed into a CTOL communication to be directly dispatched by PEC to the competent court[12].

[10] Velicogna, M. (2015) e-CODEX and the Italian Piloting Experience. IRSIG-CNR Working Paper V. 1.0, 2015. Available at SSRN: https://ssrn.com/abstract=2726515

[11] Velicogna, M. and Borsari, G. (2018) Pro-CODEX Pilot Description and Evaluation. Pro-CODEX project deliverable 3.1. IRSIG, Bologna.

[12] Velicogna, M. (2014). Coming to Terms with Complexity Overload in Transborder e-Justice: The e-CODEX Platform. In *The Circulation of Agency in e-Justice. Interoperability and Infrastrutures for European Transborder Judicial proceedins*. Ed. F. Contini and G.F. Lanzara. Springer.

**EQPAM Volume 8 No.2 April 2019**
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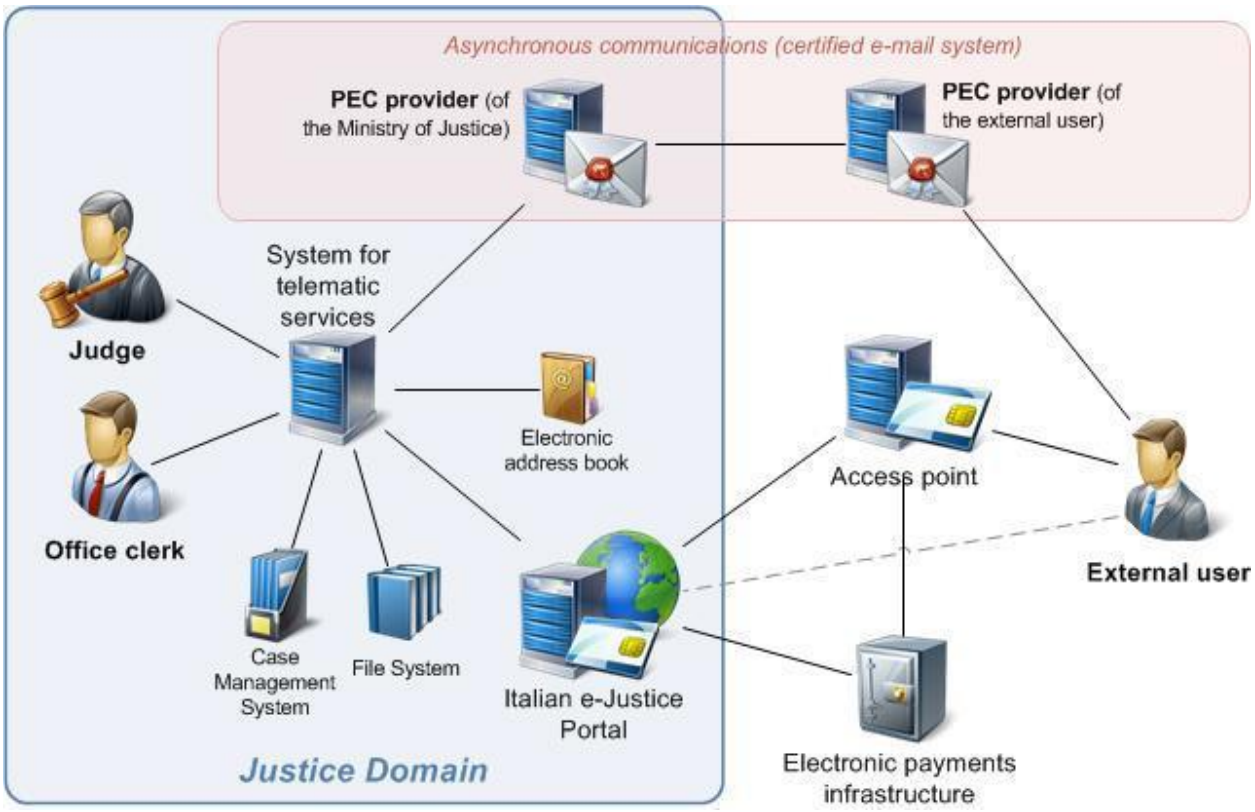


**Figure 2**
The infrastructure that enables all services (Ministry of Justice, IT Dept. 2016)

**Synchronous mode of communications** provides online access to information on proceedings and electronic acts and documents stored in the court database section (File System). These kinds of services require strong authentication to ensure a secure identification of the user (i.e. smart card, cryptographic tokens, etc.). Specific external Access Points (AP), authorized by the Ministry of Justice, allow users to access the system. Anonymous information on the status of the proceedings is available without any authentication via the e-Justice Portal or via Mobile App (for Android or iOS devices) provided by the Ministry of Justice.

The holder of an AP – which becomes responsible for the identification process of its users – can be a bar association, a public administration or a private company. AP has to comply with the security specification rules defined by the Ministry of Justice, and it is authorised to operate after passing specific security checks. The architecture of synchronous services implements A2A interoperability. In this case, the queries on CMS are demanded directly via APs, using web services applications of users.

CTOL system also enables electronic payments of court fees, connecting both the APs and the e-Justice Portal to the bank system through a dedicated IT infrastructure developed by AgID. Delivering an electronic receipt of payment back to the payer require a highly secure connection. The receipt (an XML file digitally signed by the bank) is e-filed to the court. That is the official proof of payment of court fees or other taxes. The CMS checks the integrity and authenticity of the receipt, ensuring a single usage.

European Quarterly of Political Attitudes and Mentalities EQPAM
Volume 8, No.2, April 2019
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ISSN-L 2285 - 4916

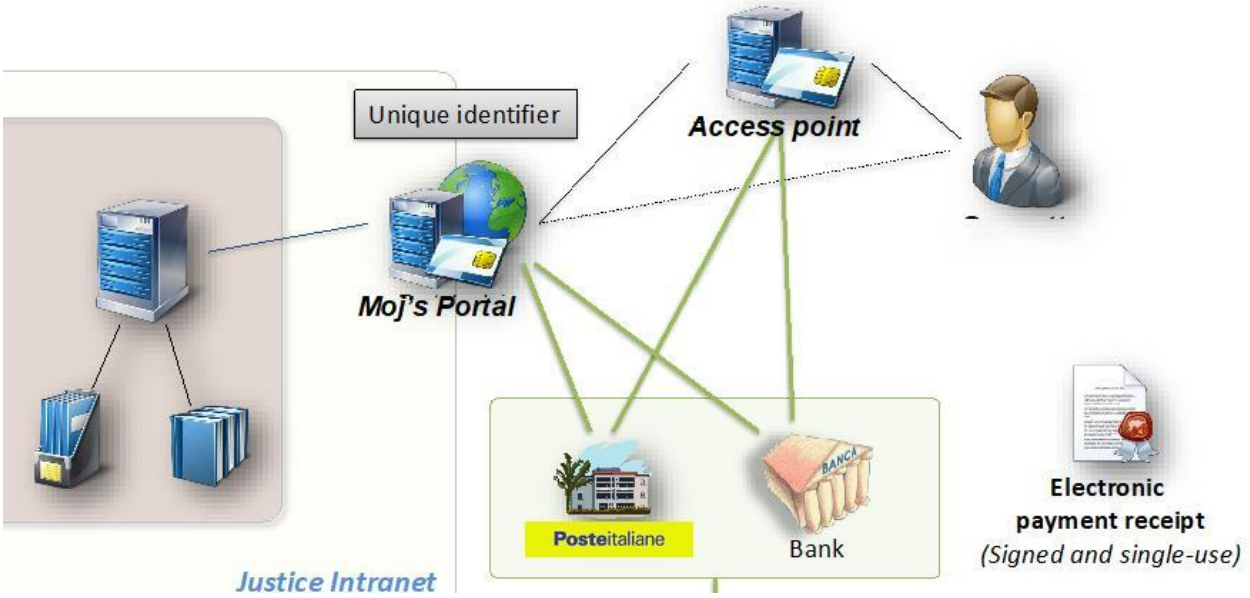


**Figure 3**
On-line payment of court fees (Ministry of Justice, IT Dept. 2016)

## 4. CTOL Users

Lawyers, and experts designated by the judge are the most important external users whereas judges and clerks are the primary internal users[13]. As mentioned before, lawyers and experts are equipped with their software application provided by the market that enables them to manage cases in term of writing, digitally signing and e-filing legal acts. Even public administrations and private companies can take benefits from all services available for lawyers and experts.

By the asynchronous mode, throughout the PEC certificate e-mail, external users are enabled to file legal acts electronically to the competent court and notify documents to other parties, reducing the need for physical access to the court or physically serve other parties: this means saving time and resources. The system allows practitioners to reduce dramatically moving paper files and documents. Moreover, they receive electronic communications from courts and other practitioners. This service gives immediate and reliable information and a consistent saving of costs to avoid delivering mail through bailiffs or postal services.

By the synchronous mode, the external users can have online access to reliable and up-to-date information on cases in the CMS with related legal acts and documents stored in the court files database. The same service is even available in Mobile Apps automatically synchronize with the court system. This service reduces access to the courts, saving time and resources both for external users and for office clerks. Furthermore, lawyers and experts can pay the court fees using the new application for online payment; another service highly appreciated by users.

As internal users, Judges are equipped with a software application that enables them to manage the cases assigned, to read and gloss the legal acts sent by the parties involved (especially from lawyers and experts) and to write, digitally sign and e-file their own decisions to the CMS. These functions are available from out-of-office too. Single judges, deputy judges, and the chief judge can also keep tracking the

[13] Ministry of Justice, IT Department (2016) Op. cit.

**EQPAM Volume 8 No.2 April 2019**
**ISSN 2285 – 4916**
**ISSN-L 2285 - 4916**

progress of the proceedings through a so-called "console" dashboard, an advanced calendar which also reports commitments, specific duties, and alerts related to deadlines. Furthermore, the case law of the court is available through a search engine with a vast number of criteria, including full-text retrieval search. Benefits are several: consistent saving of time for the decision-making process and formal checks.

The office clerks, and in particular the court registrars, on the contrary use all functions of the CTOL system for online services, because it is fully integrated into the CMS. The CMS is the "backbone" of all the information since it implements the workflow of all procedural events of the proceedings. Through specific functions of the CTOL, the user formally accepts electronic acts e-filed by both external and internal users of the court. Then, the system monitors electronic communications and notifications sent. These services allow consistent saving of time, especially in duties such as providing information face-to-face or handling circulation of documents.

## 5. Some Data on CTOL Use

This paragraph presents some data about CTOL results of the success in term of users, organizations involved and data exchanged[14].

At the time of the writing of this article, there are over 1 million of external users that use the CTOL system: 250.000 of them are lawyers; the rests are other professionals (mainly expert-designed by judges) or employees of public administrations. The external users and the personnel (judges and non-judge staff) of 139 First Instance Courts, 26 Courts of Appeal, and the Supreme Court of Cassation are obliged by law to send communications and notifications only via electronic means, of course using the CTOL system. Over 19 million messages have been sent via PEC certified e-mail in the last 12 months (average 1.5 million per month). The annual savings of costs for notification via bailiff or postal service is estimated at over 60 million Euro. Then, there are over 300.000 electronic payments of court fees in the last year for a total amount of almost 50 million euro. Moreover, from August 2017 and July 2018 nearly 14 million electronic acts have been received through the system: over 8.600.000 from external users (about 700.000 every month are e-filed), and nearly 5 million from judges (about 400.000 every month are e-filed). Finally, there are over 10 million daily accesses with on-line queries from external users or their software applications to have information on cases from APs, the e-Justice Portal, and Mobile Apps.

## 6. Pushing at the Edge of the Manageable Complexity

The current success of the system in terms of usage and monetary savings has gone through a real risk of failure because of the difficulty of handling the extreme complexity of developing the infrastructure now in place. Telling a piece of the story of the project should help to understand such complexity a little better[15].

As previously mentioned, CTOL has collected the highest investment of resources ever seen before for IT development by the Italian public sector, and it is the project on which the highest expectations were placed to overcome the chronic crisis of civil justice in Italy. The idea took shape in 1999 when the Ministry of Justice promoted an explorative study followed by a feasibility study in 2000. In 2002 and 2003 the two competitive tenders were assigned. It was expected that the CTOL system would be introduced for all civil procedures in more than 50 courts of the first instance[16] by 2005. The two competitive tenders

[14] Ministry of Justice, IT Department (2018) *CTOL Data*. Internal document.
[15] Carnevali, D. and A. Resca (2014) Op. cit.
[16] Out of 165 first instance courts - now 139, after the Judicial Map reform came into force in 2016

ISSN 2285 – 4916
ISSN-L 2285 - 4916

comprehended the large part of the system development cycle. At the end of this process, CTOL applications were tested positively.

However, at that moment the project started to run on the brink. Instead of 50 courts and all procedures, at the end of 2006, only one procedure (the payment order) was available in just one court (the Tribunal of Milan). It was a situation that underlined the distance between reality and results originally expected. The reasons were quite enigmatic considering that, at least from a technological point of view. CTOL was tested positively at the end of 2004. Answering this question, we have to consider not just the technical tool, but the interplay among interoperability at the organizational, legal, and technological level in term of increasing complexity.

As mentioned before, the CTOL system was released at the end of 2004. Alongside with the development of the CTOL architecture, a testing phase started in the seven pilot courts called "CTOL Labs" (Bari, Bologna, Bergamo, Catania, Genoa, Lamezia Terme, and Padua). The teams were composed by a team leader from the consulting firm that won the tender, a representative of IT Department of the Ministry of Justice, and in each court by the court administrator, the IT manager of the court, representative of judges and lawyers. Clerks were also involved in some specific procedures. This testing stage aimed to develop a method to promote the CTOL adoption in the courts, its integration in the working practices, and to solve eventual emerging technical problems.

The project landmarks indicated the ending of the testing stage by 2004. However, the story was quite different. On the one hand, there were considerable delays in the adjudication of tender for software and hardware development. On the other, the involvement of judges, judicial personnel, and lawyers with bar associations was more difficult than expected. Furthermore, part of the software required for the functioning of the CTOL has to be developed on the market by software houses enrolled by the bar associations (the external users' Access Point - AP), and what was offering the market was extremely expensive for bar associations. Then, lawyers had to adopt two smart cards, one for the authentication to access the system and one for the digital signature of documents, and also buy a dedicated software for accessing the system and for editing documents. In 2004-2005 this was very costly for a law firm and unaffordable for a single lawyer.

In addition, the experiment of the CTOL took place in parallel with the traditional paper-based operating system, which was the legally valid procedure at the moment. Clerks and judges had to double all the fulfilments requested by the civil procedures digitally and paper-based: an unsustainable effort with unclear perspectives. Due to these difficulties, the seven piloting courts began to disinvest. They were worried about participating in an ineffectual project. They did not have sufficient incentives to be part of it, and had to suffer from the increased costs. In 2006, the CTOL Labs gradually began to get out from the piloting.

A critical aspect that leads to these results was related to the regulations introduced between 2001 and 2004 for the development of CTOL. Specifically, CTOL features were translated into detailed legal provisions. However, this translation was not based on CTOL technical features developed for use. It was the result of CTOL business process modelling. The supposed alignment between legal aspects and technological specificities was only on paper and not based on solid piloting as at that time CTOL applications were just tested. The result was the sedimentation of a "plethora of rules" running after the technological development that should have given legal validity to the system in the real environment and therefore usable with so-called "performativity"[17] for legal practitioners — that means to act through an

[17] Mohr, R. and F. Contini (2011) Reassembling the Legal: The Wonder of Modern Science in Court Related proceedings. *Griffith Law Review 4*. Contini, F. and R. Mohr (2014) How the Law Can Make It Simple: Easing the Circulation of Agency in E-Justice.

**EQPAM Volume 8 No.2 April 2019**
**ISSN 2285 – 4916**
**ISSN-L 2285 - 4916**

online judicial procedure having the expected legal effect. In CTOL case, however, there were never rules enough to make the CTOL operational with legal validity[18], and it was always possible for the lawyers to use just the traditional paper-based channel.

In 2006, after almost six years CTOL project had reached a cost for the administration of 12 million Euro in feasibility studies, software development, testing, and organisational piloting[19]. As mentioned above, the complexities generated by the interaction between technical, organizational and regulatory components caused enormous problems to the project. It fell in a hopeless state of freezing.

When the project failure was around the corner, the unexpected happened in term of complexity reduction and to get momentum to the system. Some critical organizational and technical decisions were taken. The IT architecture was simplified to avoid expensive APs, the focus was put on implementing at least initially a straightforward judicial procedure — the payment order —, with modification of the legal framework for allowing its legal performativity, and close collaboration between courts and bar associations in facilitating user access to e-justice. All these were critical factors for the revitalization of CTOL.

The Tribunal of Milan — a court outside CTOL development programme — took the lead in a 'renewed' CTOL project. The significant investments made by the bar association of Milan, the city financial hub of Italy, with the active sponsorship of the court made possible the implementation of their own AP and started to operate a simplified version of CTOL limited to the "payment order proceedings". The management of the complexity was also made possible through the creation of a so-called "Innovation Office" inside the Tribunal of Milan: an organisational unit that joined up representatives of the local bar association, judges, clerks, and local IT system administrator to discuss the organisational and legal implications of the implementation of CTOL. Differently from the six laboratories, a top-down piloting process, the Innovation Office engaged from the bottom-up all local actors involved, and in particular the lawyers and their bar association: the crucial component of the judicial system, very interested in the success of the CTOL because of the business opportunity it may provide if properly implemented.

Furthermore, the main problem associated with AP development was the cost to be paid by each bar association for IT specialists engaged in the development of the AP and interoperable external users software applications. In addition, software houses had problems in cooperating with the IT Department of the Ministry of Justice to collect the technical documentation needed for developing the external interface. In this regard, the IT Department of the Ministry of Justice decided finally to change the CTOL architecture. Particularly relevant for our analysis in term of technological change is the switch from the old *ad hoc* application for communications and transmissions using the very expensive AP to a new one based on the standard of the 'certified e-mail', a system used in all public administration and by citizens as registered e-mail. With this new architecture, lawyers could communicate with the courts through standard personal PEC e-mail procured from a broad set of private providers instead of the CTOL Ministry of Justice's dedicated system via AP, with a drastic reduction of costs for users. Overcoming the idea to develop a closed information system and moving toward a more open architecture of an information infrastructure[20] — existing "IT structures, systems and applications, networks, organizations, procedures, practices, rules,

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In *The Circulation of Agency in e-Justice. Interoperability and Infrastrutures for European Transborder Judicial proceedins*. Ed. F. Contini and G.F. Lanzara. Springer.

[18] Carnevali, D. (2009) e-Justice and Polices for Risk Management. In *e-Justice: ICT in the Court System*. Ed. A. Cerrillo and A. Fabra. Harshey: Information Science Reference.

[19] About 84% of the total investments in ICT projects in the civil sector. Fabri, M. (2009) Op.cit.

[20] Hanseth, O., E. Monteiro, and M. Hatling (1996) Developing Information Infrastructures: The Tension between Standardization and Flexibility. *Science, Technology and Human Values, 21(4)*.

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actors linked together for exchanging information" [21] — allowed to critically reduce the complexity of the tools and legal framework to be designed and implemented. In this perspective the, PEC was a crucial step because it produced a faster bootstrapping of the system, as a critical mass of users had already adopted it. This supported the quick growing of the users base through 'self-reinforcing' processes[22]. Riding this positive wave, the Ministry of Justice, with the support of the Parliament, introduced a mandatory regime of online judicial procedures progressively replacing the paper-based one. Several requests filed to the Supreme Court of Cassation by lawyers against this new system were always rejected. The purpose of the CTOL system was no more questionable.

While this new approach succeeded, it did not do it overnight. Key to this success were the experiences acquired in the Tribunal of Milan changing in the approach to innovation process, the change in CTOL architecture, and the change in legal provisions regulating it (law n. 24/2010). Following this legal change, since 2011, CTOL restarted as a national project increasing day-after-day in term of the number of court involved and type of procedures activated.

In this situation, it is crystal clear that the interaction between law and technology plays a crucial role. Studies on the CTOL case and other IT systems and applications in the judicial context in other countries[23] show that the operating rules of online procedures are the result of the combined disposition of machine codes and legal provisions (the so-called "techno-legal assemblages"[24]) are much more rigid than the rules themselves took separately[25]. The combination of two rigidities often leads to paralysis of an IT system, or application, such as CTOL system is a case. Not every legal provision can be effectively inscribed in machine codes and the other way around. So the mediation of law and technology is not always acceptable or sustainable for techno-legal assemblages, during the development process of IT systems or applications.

## 7. Managing the Complexity: Some Reflections on the Design of Success

As mentioned before, the current success of the CTOL system has gone through a real risk of failure because of the difficulty of handling the extreme complexity of the system. At the same time, the problem of mediation between technology and law is still there.

In reducing systems' complexity, at the very beginning it is necessary to have a clear awareness of the specific nature of different complexities inside the different functional domains: technology (IT infrastructures, systems and applications), legal provisions, and organization (in term of operating judicial procedures in the court and people involved). Then, to understand the critical need to provide mediation among these elements: a lack of it creates problems for the design and adoption even for simple online judicial procedures, hinder access to the system and the extended use of it. In other words, it is necessary

[21] Hanseth, O. and M. Aanestad (2003) Op. cit.
[22] Hanseth, O. and M. Aanestad (2003) Op. cit.
[23] Contini F. and G.F. Lanzara (Eds.) (2009) *ICT and Innovation in Public Sector. European Studies in the Making of e-Government*. Basingstoke: Palgrave Macmillan. Contini F. and Lanzara G.F. (Eds.) (2014) *The Circulation of Agency in e-Justice. Interoperability and Infrastrutures for European Transborder Judicial proceedins.* Springer. Velicogna, M. (2018) e-Justice in Europe: From National Experiences to the EU Cross-Border Service Provision, In *International E-Government Development*. Ed. L. Alcaide Muñoz and M.P.R. Bolívar. Palgrave Macmillan, Cham.
[24] Lanzara, G.F. (2009) Building Digital Institutions: ICT and the Rise of Assemblages in Government. In *ICT and Innovation in Public Sector. European Studies in the Making of e-Government*. Ed. F. Contini and G.F. Lanzara. Basingstoke: Palgrave Macmillan.
[25] Contini, F. and A. Cordella (2015) *Assembling law and technology in the public sector*. Conference paper. DOI 10.1145/2757401.2757418.

**EQPAM Volume 8 No.2 April 2019**
**ISSN 2285 – 4916**
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to create conditions to support the so-called "circulation of agency"[26]. It means the capacity for agents (lawyers, experts, judges, clerks, etc.) to produce legal and administrative effects across functional domains. Inversely, the technology will never develop in term of performativity, a helpful self-reinforcing learning process will not begin for users and positive returns in term of effectiveness and performance will not be generated, so the system will never take-off[27].

At first, one key element in the design for reducing complexity is the capacity to promote the **cultivation** of the information systems components that are evolving in the different domains: technological, legal, and organisational[28]. Design action should be taken concurrently in all of these domains. An e-filing system, for instance, is successful when they support the agents' everyday routines without being perceived as obtrusive. Some design strategies will be sketched here according to the imperative to have minimal complexity (or maximum simplicity) compatible with functionalities[29].

Furthermore, **modularity** is the basis of an incremental approach. And it is recognized as the primary strategy to enhance flexibility and reduce complexity. Modularity reduces complexity as for disconnecting complexity from the dimension of the service. Information infrastructures are assembled with components that can be independently added to or disconnected from the whole without a big loss for the functionality[30]. They include large-scale heterogeneous systems with no fixed boundaries, open-ended, and multi-layered. They arise and release components in their development to and from different domains, which are assembled and connected in a sort evolving architecture[31].

In the design, there are other two "dual" key elements for the effective absorption of complexity: the "maximum feasible simplicity" and the "maximum manageable complexity"[32]. The duality here means that the design problem can be expressed with two distinct and related formulations that can become the constraint for each other. A well-designed system must strike a dynamic balance between the two.

In the set-up to design online judicial procedures, it is crucial the question of what is the **maximum feasible simplicity** in term of "functional simplification"[33] compatible with legal validity to give performativity to them. In other words, it is essential to know how much the simplification can be supported by the judicial procedure in term of removal of controls and safeguards, for instance, without subtracting performativity from it.

On the other way around, it is essential to know what is the **maximum manageable complexity** of a judicial procedure that a user can handle — compatible with his or her limits of competence and time — or an available technology and organization can give it performativity. It means how much complexity can be embodied in the online procedure without turning into a limitation for the circulation of agency. In other

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words, it is possible to imagine that online procedures should be able to encompass and respond to litigations that involve reasonably high money values, special matters, or a multiplicity of actors/institutions (experts, public administrations, companies, etc.) but still within a maximum threshold of complexity beyond which procedures, interfaces, and transactions become too complex to be handled effectively[34].

To have an **effective "techno-legal assemblage"**, legal provisions are required to authorize the use of technology and to define the features that a specific technology must have to give legal validity on a legal action performed through an online judicial procedure[35]. At the same time, regulations must not exceed the legal needs for operating technology[36]. The assemblage is the result of a mediation process between machine codes and legal provisions that has to give performativity to an online judicial procedure. As mentioned before, during the development process of IT systems or applications, very often nobody is taking care of ensuring that this assemblage works in practice and can be sustainable over time.

Too much complexity in term of architectural design, number or variety of procedures involved (with their technological requirements) from which to begin, problems of alignment between actual technology, practice and the norms which are introduced to regulate them may then be incompatible with the development and implementation of a performative e-service. If the maximum threshold of complexity has trespassed, the agency doesn't flow smoothly, and the online procedures are blocked: the failure is around the corner.

## 8. Conclusion

CTOL was a typical nationwide e-filing project with ambitious goals to be obtained in little time. Technical solutions envisaged showed severe limits when the system was tested in the real environment. After a period of crises and the following lock-in of the system and project freezing, first applications succeeded to get into operation mainly due to the strong simplification attempt and the (organizational) efforts of the Tribunal and bar association of Milan. This can be considered a turnaround point: the passage from a comprehensive strategy to an incremental and interactive one. Moreover, adopting the standard certified e-mail application, the IT Department of the Ministry of Justice reduced drastically costs related to the development of a proprietary system of AP and the following transaction costs. Then, the attempt to develop legal provisions strictly connected with the actual technology requirements, extending the type of proceedings managed by the system gradually and after much learning by doing, and then making the various functions of the system progressively mandatory for users.

This new strategy allowed acquiring knowledge to be able to deal with main obstacles in the way of the deployment of CTOL project leading to organizational, technological and legal solutions that outlined a significantly different scenario in front of this project. The Ministry of Justice took up this functional simplification approach, thus beginning a process of incremental development of the system (modularity), in a way shared among the primary protagonists: judges and lawyers at first (cultivation). That has led to the current success of CTOL system, in which the constantly taking care over time of the cumbersome interaction between law and technology is the crucial key.

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**EQPAM Volume 8 No.2 April 2019**
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