

# Coordinating criminal justice: A Qualitative Comparative Analysis of inter-organisational information sharing of four EU Member States

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## Abstract

Qualitative-comparative analysis of four cases of inter-organisational information sharing in criminal justice chains demonstrates the causal asymmetry between successful and unsuccessful inter-organisational information sharing. While unsuccessful information sharing requires poor project management, successful information sharing also requires compatible technologies which are implemented either by means of a small-scale, bottom-up approach to standardization or a top-down, centralised architecture. By triggering the radical restructuring of information-sharing workflows, good project management and compatible technologies set in motion underlying mechanisms that generate successful inter-organisational information sharing. Implications are discussed by highlighting the role of coordination by technological feedback in a context of increasing digitization.

**Key words:** supply-chain coordination, criminal justice, qualitative comparative analysis

## Introduction

Nowadays, the majority of products and services, both in the private and public sectors, are produced by chains of organisations instead of individual organisations. As such, organisations increasingly have to rely on effective supply-chain management to survive in the networked economy. Supply-chain management helps organisations to integrate and coordinate systemically the processes that take place across organisational boundaries. Information technology (IT) is essential for supply-chain management since it is capable of processing large amounts of data in short-time intervals and enables long-distance communication. Therefore, (chains of) organisations need to invest in IT and are often tempted to spend more and more money on IT (Zhang et al., 2011).

Far from being private sector phenomena, IT investments are becoming very conspicuous in the public sector especially in Western Europe (Gidlund, 2012). Given the pronounced IT investments of many Western European countries, in this paper we endeavour to analyse inter-organisational information sharing initiatives from the perspective of coordination theory (Thompson, 1967; Van de Ven et al., 1976). By focusing on the criminal justice systems of

four purposefully-selected European Union (EU) Member States, namely Austria, Denmark, England & Wales (hereafter referred to as England for simplicity) and Estonia, we ask the following questions: 1) What are the causes that lead to successful inter-organisational information sharing? 2) In what configurations do such causes combine and what are the underlying mechanisms that generate successful inter-organisational information sharing (or the lack thereof)? Using a supply-chain perspective for studying criminal justice systems (de Blok et al., 2014), we view the criminal justice chains under examination as ensembles of IT-embedded work practices and information-sharing workflows aiming for criminal law enforcement. Subsequently, we deploy Qualitative Comparative Analysis (QCA) techniques to compare the four EU countries under investigation and distil commonalities within the same types of cases and differences across distinct types of cases (Ragin, 1987).

Despite the small number of cases under investigation, our findings are eye-opening because they reveal the causal asymmetry between positive and negative cases. While unsuccessful inter-organisational information sharing revolves around poor project management, successful information sharing is much more taxing because it also requires compatible technologies that enable the criminal justice chain partners to communicate between and among each other securely. By triggering the radical restructuring of the information-sharing workflows between and among the criminal justice partners, good project management and compatible technologies act as causes of underlying mechanisms that generate successful inter-organisational information sharing. Thus, the removal of a necessary and sufficient condition for failure, i.e., poor project management, may be a necessary condition but hardly a sufficient condition for successful inter-organisational information sharing. A recipe for success goes further and entails in our context compatible technologies that enable secure information exchanges whether by means of a small-scale, bottom-up approach to standardization (see England) or a single, centralised architecture developed in a top-down fashion (see Estonia). In this paper, we discuss the implications stemming from our findings.

The remainder of the paper is organised as follows. Section two highlights the role of IT in supply-chain management. Section three introduces QCA as a research approach and a set of techniques for conducting comparative analysis. Section four analyses the empirical data at hand by producing four short summaries concerning the four cases under investigation. Section five discusses our key findings by highlighting the causal asymmetry between positive and negative cases. It also brings the paper to a close with new insights concerning the role of coordination by technological feedback conceived of as the mutual exchange of information between and among the criminal justice partners in a technology-mediated fashion.

### **Theoretical background**

ITs are playing a key role in terms of integrating information workflows among partners in any supply chain (Christopher, 2000). As such, ITs are seen as important or even indispensable aids to improve supply-chain performance (Zhang et al., 2011). ITs can be deployed to improve the various individual steps, activities or sub-processes of a supply chain in a piecemeal fashion, such as planning of supply and demand, sourcing of products and services, production, delivery and return (Simchi-Levi et al., 2004). However, ITs can also enable a more integrated approach to manage the entire supply chain. For example, Christopher (2000) has argued for the need to use ITs to share data between and among supply-chain partners. The intensive use of ITs should foster process integration whereby supply-chain partners work collaboratively using common systems and shared information (Ibid). Following the same train of thought, Fawcett's et al. (2011) findings support the argument that IT investments make their greatest contribution to firms' performance when they are combined with an information sharing culture aimed at building dynamic collaboration within the supply chain. Similarly, and related to this study's central concerns on e-Government, Sawyer et al. (2013) have developed a framework that

embodies the organisational, operational and technological dimensions that are key to understanding the role of ITs in digital government and identified two core configurations of successful IT-enabled information sharing revolving around data management issues (Courts) and integration and interoperability issues (Police). Taken together, these studies point to the critical role that ITs play in enabling inter-organisational information sharing both in the private and public sector. ITs support seamless information sharing between and among the supply-chain partners, thus fostering the pursuit of mutually-acceptable outcomes.

Given the pivotal role that ITs play in the integration of information systems in supply chains, it is remarkable that only a handful of studies have taken a holistic perspective to study the criminal justice system (de Blok et al., 2014). Yet the criminal justice system may be regarded as a complex network of organisations that work together towards a common goal, namely the enforcement of criminal laws (Ibid). Typical partners in the criminal justice chain are the Police, the Public Prosecution Service, the Courts and the organisations involved in the execution of sentences. These organisations are all jointly in charge of law enforcement (Ibid).

Rarely, do criminal justice organisations work alone in the execution of their tasks and activities. Rather, their tasks and activities are interdependent because their workflows depend either on shared resources or prior information inputs in a sequential or mutual fashion (Thompson, 1967; Van de Ven et al., 1976). Whether revolving around pooled, sequential or reciprocal interdependences (Ibid), ITs can foster the management of interdependences between and among the criminal justice chain partners, thus playing a key role in enabling the coordination of criminal justice chains across European countries (de Blok et al., 2014). Hence, this paper investigates the key components of successful inter-organisational information sharing within the criminal justice systems of four EU Member States from the perspective of technology-embedded coordination. It specifically aims to study the way these components combine to determine successful or unsuccessful inter-organisational information sharing while unravelling the underlying causal mechanisms that generate the outcome of interest.

### **Methodology: the set-theoretic approach**

Given our interest in the causes leading to successful and unsuccessful inter-organisational information sharing within the criminal justice systems of four EU Member States, we deployed QCA techniques that revolve around an approach that articulates our causal expectations in set-theoretic terms (Ragin, 1987). Set theory aims at separating a group (or set) of elements from everything else on the basis of a criterion of membership (Ibid). For example, based on whether the country under investigation has experienced efficiency savings (or not), we identified two separate groups of cases, namely cases with successful inter-organisational information sharing and instances of non-successful information sharing.

We designed our study by using the indirect method of difference which consists of a double application of the method of agreement (George and Bennett, 2005; Ragin, 1987). Essentially, we first searched for similarities across cases that might account for similar outcomes in terms of successful inter-organisational information sharing. We then searched for differences across cases that might account for differences across outcomes (i.e., successful vs. unsuccessful inter-organisational information sharing). Thus, we deemed cross-case commonalities to be irrelevant when moving from positive (i.e., successful information sharing) to negative cases (i.e., unsuccessful information sharing) because conditions present in both types of cases cannot account for differences in case outcomes. Hence, we deployed an approach that mirrors the replication logic (Yin, 2009). The search for similarities helps one predict similar results (i.e., literal replication). The search for differences helps one predict contrasting results in terms of successful vs. unsuccessful information sharing but for anticipatable reasons (i.e., theoretical replication).

QCA is simultaneously a context-oriented research approach and a set of techniques aimed at unravelling causal complexity. As a context-oriented research approach, QCA interweaves the context-sensitive logic of process theories with the variance-oriented logic of quantitative research seeking explanations in terms of independent (or causal) variables causing changes in the dependent (or outcome) variable. QCA's context-sensitive logic is both deductive and inductive. It is deductive because causal relations are informed by prior theory. It is inductive because coding revolves around the substantive knowledge of the empirical cases at hand, as well as the unravelling of underlying mechanisms generating the outcome of interest (Rihoux and Ragin, 2009).

QCA techniques are based upon a specific template for undertaking data analysis. Table 1 displays the required steps (Ibid).

*Table 1 – Steps performed for QCA*

Step	Activity	Literature used
1 - Calibrating data	Transforming rich contextual detail into set membership. We coded each causal variable and the outcome of interest as being either present (coded as 1) or absent (coded as 0).	Three core determinants of successful inter-organisational information sharing from the e-Government literature (e.g., Gil-Garcia et al., 2005; Kubicek et al. 2011; Pardo et al., 2012; Sawyer, et al. 2013): 1) <b>Compatibility</b> : the ability of supply-chain partners to communicate between and among each other securely; 2) <b>Project management</b> : supply-chain partners managing information-sharing projects effectively; 3) <b>Target-driven planning</b> : supply-chain partners developing a top-down approach to inter-organisational information sharing. Subsequently, based on de Blok's et al. (2014) study, we regarded efficiency savings (e.g., reduced duplicate data entry and handling, improved throughput time of criminal cases, etc.) as indicators of <b>successful inter-organisational information sharing</b> because they warrant seamless information sharing in the execution of interdependent activities.
2 - Building a dichotomous truth table	Listing all logically-possible combinations of causal conditions with their associated outcomes (see Table 2).	Rihoux and Ragin, 2009.
3 - Minimising the truth table	Deriving three solutions ranging from the most complex to the most parsimonious solution with an intermediate solution striking a balance between the two extremes thanks to the removal of redundant causal conditions.	Rihoux and Ragin, 2009.
4 - Interpretation of findings	Interpreting findings and making sense of the pathways leading to the presence (or absence) of successful inter-organisational information sharing and the underlying causal mechanisms.	Rihoux and Ragin, 2009.

### Analysis

Based on primary and secondary data that was collected using a mix of semi-structured interviews and reports, our analysis of the logically-possible combinations of causal conditions leading to inter-organisational information sharing (or the lack thereof) produced the following truth table:

Table 2 - Truth table

Country	Compatibility (Standardized technologies: are technologies/information systems standardized, consistent and interlinked so as to exchange data/information securely?)	Project Management (Do IT projects in general and information-sharing initiatives in particular account for user requirements, training and buy-in? Are the right suppliers being chosen? Are relations with such suppliers managed effectively? Have Working Groups been set up to monitor progress and negotiate requirements? Are projects building upon the pre-existing installed base?)	Target-driven Planning (Did the government set out a comprehensive, long-term vision with a clear, target-driven IT strategy? Were Governance Structures and Consultative Bodies set-up to enact this grand vision?)	Successful inter-organisational information sharing (Are criminal justice chain parties seamlessly interacting? Are they streamlining prior manual routines and producing efficiency savings?)
<b>Austria</b>	1	0	1	0
<b>Denmark</b>	0	0	0	0
<b>England</b>	1	1	0	1
<b>Estonia</b>	1	1	1	1
<b>Empty row with no cases</b>	1	0	0	Likely negative case
<b>Empty row with no cases</b>	0	0	1	Likely negative case
<b>Empty row with no cases</b>	0	1	0	Likely negative case
<b>Empty row with no cases</b>	0	1	1	Likely negative case

Austria was coded as a negative case of successful inter-organisational information sharing because it transposed electronic files onto pre-existing, paper-based work routines (an instance of poor project management). Though Austria may be regarded as a frontrunner when it comes to e-Government projects, overall its criminal justice chain is yet to be successfully digitised (de Blok et al., 2014). The striking thing about the Austrian case is that Austria is endowed with a government-wide communication system (i.e., Electronic Legal Communication) that enables the automatic allocation of cases based on legal expertise thanks to a case distribution system (Koch and Bernroider, 2009). Its government-wide IT system coupled with a comprehensive approach steered by the Ministry of Justice and a variety of Consultative Bodies and Committees should have given a head start to Austria's inter-organisational information sharing initiatives. However, Austria is yet to successfully achieve inter-organisational information sharing because, for example, Prosecutors work on paper files called diaries rather than using electronic case files (de Blok et al., 2014). Likewise, the fact that users were given the option to carry on using paper files coupled with the launch of too many IT initiatives at once, have seriously underplayed the manifold complexity involved in coping with wicked problems (Rittel and Webber, 1984), thus leading to the undesired yet intensive use of paper files especially amongst Judges.

Denmark too was coded as an instance of unsuccessful inter-organisational information sharing because the information workflows are mostly paper based (de Blok et al., 2014). Only in very few cases is the paper file scanned to be used in the Courts. Yet the lack of national agreements setting out which organisation has to undertake the scanning process coupled with

the lack of legislation enforcing the use of electronic case files has meant that all parties involved (i.e., Police, Prosecution, Courts and Prison Services) regard the electronic file as a simple supplement of the paper file (which is instead considered the original file). There are multiple causes that work synergistically towards the redundant use of paper files in Denmark ranging from the absence of an overarching vision (e.g., the Ministry of Justice has developed a governance structure with an overall IT strategy only recently) to the lack of good project management (e.g., poor choice of IT suppliers) and the lack of compatibility between and among most IT systems (e.g., printing and posting of hard copies because most IT systems are incapable of exchanging digital files securely).

England instead was coded as a case of successful inter-organisational information sharing because of the efficiency savings stemming from the seamless use of electronic case files between Police and Crown Prosecution Service (Ibid). Once again, there are multiple causes in England that work jointly to explain why this country is experiencing sizeable efficiency savings. First, the IT systems are broadly compatible, this being especially the case between the Police and the Crown Prosecution Service (CPS) where shared data standards create a “multitude of links” (Ibid). Though the Courts still work on paper, the Police and CPS exchange secure electronic documents either by means of a two-way interface or a one-way interface (Iannacci, 2014). Second, there is evidence of good project management thanks to the pronounced use of long-term contracts with IT suppliers to ensure that they have a long-term interest in the IT solutions being provided. Though England is characterised by a highly fragmented and disjointed approach to inter-organisational information sharing, it has experienced more substantial efficiency savings than its counterparts (especially Austria) because it is not re-inventing the wheel and starting all over again. On the contrary, England is thoroughly restructuring work processes in a reciprocal, back-and-forth fashion through a small-scale, bottom-up approach to standardization.

Lastly, Estonia too was coded as an instance of successful inter-organisational information sharing because of its considerable efficiency savings. With the exception of the Courts where ITs are still under development, the other criminal justice chain partners exchange information digitally thanks to a centralised IT architecture (i.e., E-File). This is so because of a variety of reasons ranging from the presence of a clear vision that the IT architecture under development has to meet to the existence of input-output process standards that link disparate IT applications and the presence of good project management aimed at striking a balance between in-house IT development and outsourcing (Ibid). For example, Estonia has encouraged both private and public sector suppliers to work together in the development of a centralised IT architecture that operates both as a database and a messaging system that links all criminal justice chain partners together thanks to shared input-output process standards. Though unconventional, the right mix between public and private sector suppliers has proved successful.

## **Discussion and conclusions**

The comparative analysis of the four country-cases leads to several eye-opening insights. Successful inter-organisational information sharing is much more demanding than its opposite scenario characterised by the intensive use of paper files. While poor project management is bound to create setbacks by default (see Austria and Denmark), good project management is a necessary but not sufficient condition for successful inter-organisational information sharing. A successful inter-organisational information sharing initiative goes well beyond good project management and entails in our context compatible technologies that enable secure information exchanges whether by means of small-scale data standards (see England) or shared process standards based on a large-scale, centralised IT architecture (see Estonia). The intermediate solution for positive cases reveals that:

## COMPATIBILITY AND PROJECT MANAGEMENT are individually necessary and jointly sufficient conditions for SUCCESSFUL INTER-ORGANISATIONAL INFORMATION SHARING

Put differently, a prescriptive, target-driven approach is required only if the partners want to achieve shared process standards in their inter-organisational workflows. Modelling business processes around an overarching process is a much taller order than simply linking up computer systems by means of shared data standards (Kubicek et al., 2011). On the contrary, if criminal justice chain partners develop fragmented IT projects which are interconnected through makeshift data standards, a grand vision may become a point of arrival rather than departure. As reported by an informant in England: *It would have been nice to have all criminal justice parties signed up on a shared digital vision earlier in time. However it would probably not have been possible then to have everyone agree and see the need for such an agreement. The parties needed to go through the process of overcoming the barriers of individual projects before being ready to jointly agree what to achieve* (Senior Strategy Advisor, Ministry of Justice).

Hence, even in the absence of a shared vision, criminal justice chain partners can cooperate seamlessly provided that good project management and shared data standards are in place. Though extant e-Government literature has emphasised the role of prior strategic planning time and again (Gil-Garcia et al., 2005; Pardo et al., 2012), it turns out that emergent approaches may be suitable strategies in the context of lower-level, inter-organisational information sharing efforts.

Conversely, the intermediate solution for negative cases can be captured with a single ingredient:

The lack of PROJECT MANAGEMENT is necessary and sufficient for the lack of SUCCESSFUL INTER-ORGANISATIONAL INFORMATION SHARING

The above solution shows that project management is a wicked problem that is both socially and cognitively challenging (Rittel and Webber, 1984). Even in the presence of a target-driven plan and compatible technologies, criminal justice agencies may revert back to clumsy, paper-based work routines if, for example, their members do not get proper training or, alternatively, too many projects are developed at once. As reported by an informant in Denmark: *Users were insufficiently trained to use POLSAG [a national document management system for Police and Courts]. They did not get enough support in understanding how the new system would be used and could affect their work [practices]. They did not get used to working with the [new] system to support their day-to-day work* (IT Project Leader, Police). Likewise, an informant in Austria maintained that: *The Ministry of Justice started with an IT project concerning the electronic handling of offenders. The grand plan was to improve this project step by step but we are still far from the final stage. The vision is to handle unknown and known offenders. At the moment, we are kind of uncertain on how to proceed because we have another project (i.e., Justiz 3.0) that is likely to interfere with this project on a larger scale. It may also increase users' resistance, particularly Judges who have a strong affection to their paper-based files* (IT Consultant, Ministry of Justice).

To avoid users' resistance, the Austrian IT Government Unit undertook a cautious approach based on the parallel usage of paper and electronic case files. As reported by an informant: *The judges are fond of paper files. Therefore, as a compromise, we had to settle for the individual judge to choose whether he wants to work on the digital file or on a paper-based file* (IT Consultant, Ministry of Justice). Though this decision was a good choice from a textbook perspective, it seriously underestimated the stickiness of inter-organisational work routines (Iannacci, 2014). Little wonder that, at the first opportunity, the Austrian Judges reverted back to tried-and-tested paper files: *When they introduced the electronic file in the Ministry of Justice, the need for paper increased because everybody wanted to print the files out as they*

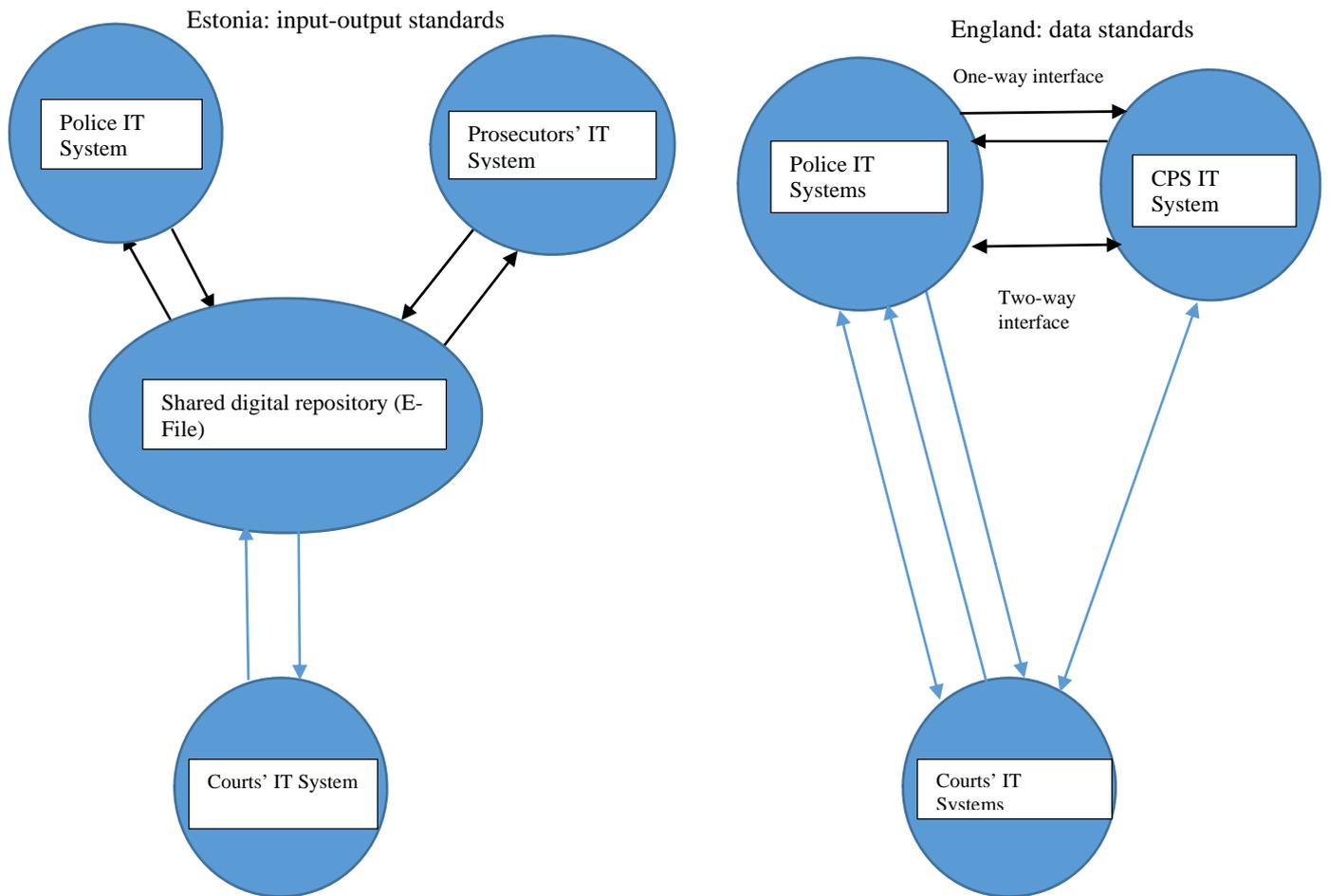
were used to them. And then the confusion increased. More people had a copy of the printed file but different persons had different numbers of pages printed or different versions of the same documents (Judge, Ministry of Justice).

Conversely, the analysis of the two success stories shows that England and Estonia have not thrown textbook solutions at wicked problems. Through confident project management and meticulous standard-setting negotiations following either a prescriptive or emergent plan, these two countries instead have endeavoured to eradicate paper-based workflows and streamline their inter-organisational work routines from the very outset. As reported by an informant in England: *Digitization should not mean making a paper form into a PDF [file] and emailing it across to someone else in the criminal justice chain. Specifically, it should not imply that poor [manual] practices and processes are just made digital* (Crown Prosecutor).

The standard workflow in the criminal justice system consists of a sequential chain of activities where the output of one organisation becomes the input of the next organisation in line. For example, the output of Policing Organisations (i.e., evidential material) becomes the input of Prosecuting Organisations (i.e., raw materials for a charge). By the same token, the output of Prosecuting Organisations (i.e., charges) becomes the input of the Courts for their sentencing decisions and so on and so forth.

However, the radical restructuring of criminal justice chains means that sequential interdependences are being transformed into reciprocal interdependences where information flows in a reciprocal, back-and-forth manner between and among the criminal justice partners (Van de Ven et al., 1976; Thompson, 1967). As reported by an informant in Estonia: *E-File is both a shared database for the collection, use, exchange etc. of procedural information and it also fulfils the role of so-called messenger between its daughter systems (or client systems connected with the central database). In addition, E-File knows whom a technical message or notification should be sent to and informs this particular party about new data received or any other data amendments taking place in the system. There are different services for different purposes in E-File, e.g.: content or document services, supportive services, search services, viewing services etc. E-File minimizes multiple data entries making it compulsory to use data already entered into the system by the same or another user. As such, data is collected and managed for the lifecycle of the business process in a single, safe and secure database. E-File provides the ability to collaborate between police, prosecutors and court officers through the system as each [party] can see and work on the case file in real-time* (Business Analyst, Ministry of Justice). Similarly, another informant in England maintained: *Although evidential material has come to the CPS Casework Management System either as structured data [from the two-way interface] or as data directly uploaded onto the Casework Management System [from the one-way interface], we can use the Casework Management System to compile all these data together and populate various forms automatically. Once our decision has been made, we can use the Casework Management System to send the decision back to the Police electronically. We only need to enter the information once in the connected systems. Anything else that is then being done is effectively adding value because information is automatically populated into the IT Systems. Nobody spends any efforts manually recording information. There is no manual re-keying of information* (Crown Prosecutor, Criminal Justice System Efficiency Programme).

This, in turn, suggests that the successful criminal justice chains are radically reconfiguring their activities to become value-adding networks (Christopher, 2011). The two success stories point to separate ways by which the criminal justice partners can add value to each other's efforts, namely by means of a shared repository (Estonia) or through directly inter-connected systems (England). Figure 1 sketches these two types of value-adding networks.



**Legend:**

Black arrows: links already developed; Blue arrow: links under development

*Figure 1- Criminal justice chains as value-adding networks relying either on process standards or data standards*

Such value-adding networks rely on coordination by technological feedback to manage their interdependences. Coordination by technological feedback is suitable for the management of reciprocal interdependences because it enables the mutual exchange of information between the parties in a technology-mediated fashion. Our two success stories show that coordination by technological feedback presupposes some form of IT strategy whether prescriptive (Estonia) or emergent (England) and some form of standardization based either on input-output process standards (Estonia) or data standards (England).

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