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REAPPRAISING MATURITY MODELS IN E-GOVERNMENT RESEARCH: THE TRAJECTORY-TURNING POINT THEORY

ABSTRACT

Drawing on the notion of alignment, this paper endeavors to reappraise e-Government maturity models in the English system of criminal justice. It argues that e-Government maturity models are characterized by relatively-stable trajectories which are punctuated by radical shifts toward full-blown e-Government transformation. Far from being a prescriptive and linear process, e-Government maturity is an unpredictable process where turning points (or radical shifts) play a crucial role in the e-Government strategizing process. Theoretical and practical implications are discussed by developing a new theory of e-Government maturity that explains the twists and turns of e-Government strategizing.

Key words: alignment, maturity model, process theory, turning point, generative mechanisms, improvisational capabilities.

1. INTRODUCTION

E-Government maturity has been the subject of numerous studies (Davison et al., 2005; Layne & Lee, 2001; Lee, 2010; Janowski, 2015). Notwithstanding this burgeoning volume of literature, e-Government maturity models share a common background logic because they are grounded in process theory (Lasrado et al., 2015; Poeppelbuss et al., 2011). Drawing on the "stage-naming" variety of process theory (Mohr, 1982, p. 53), these models predict the linear development or evolution of e-Government from a basic online presence to full integration, seamlessness, and transformation (Coursey & Norris, 2008, p. 524). They also suggest that this development is progressive (i.e., each successive stage is better than the previous one), stepwise (i.e., each step is a necessary pre-requisite for the following step in the sequence), and prescriptive (i.e., each step must occur in a prescribed order in accordance with a pre-existing plan or vision), thus emphasizing "the chain of successful events" (Mohr, 1982, p. 57) rather than the "mechanisms by which subsequent stages come about" (Markus & Robey, 1988, p. 592). In this paper, we join a growing stream of research that has already criticized maturity (or stage) models for their prescriptive and linear nature both within (Coursey & Norris, 2008; Sandoval-Almazán, R., & Gil-Garcia, 2018) and outside the e-Government domain (Galliers & Sutherland, 1991; Sabherwal et al., 2001). Though existing research has stressed that stages are neither mutually exclusive nor stepwise and prescriptive, only a handful of scholars have turned their attention to the mechanisms of change and development (Debri & Bannister, 2015; Estermann, 2018; Lasrado et al., 2015; Poeppelbuss et al., 2011). Yet, understanding these mechanisms is an important endeavor in the e-Government context because it may help managers, policymakers, and IT designers alike to explain how e-Government evolves and why it evolves the way it does which, in turn, is an essential pre-requisite to strategic planning (Debri & Bannister, 2015).

In what follows, we combine the perspectives of maturity and strategic alignment models as the starting point for addressing the intricacies and complexities of public sector projects. Using the criminal justice system of England and Wales (hereafter referred to as England for simplicity) as the setting for the investigation of the alignment between strategic and technological imperatives, in this study we ask the following questions: 1) How does this system evolve? 2) Why does its evolution defy, to a certain extent, rationalistic planning? Drawing on Abbott's (2001) concept of turning point, we show that e-Government evolution is an unpredictable process where e-Government trajectories display long sequences of interdependent and interlocked events which are punctuated by turning points that re-direct trajectories (or paths). These turning points signal the radical shift toward the full-blown transformation of Government infrastructures and processes, thus pointing to an overarching pattern characterized by the alternation between trajectories and turning points (Abbott, 2001). By so doing, we respond to recent calls for future research to "conduct more longitudinal studies to develop process models of e-Government evolution, that is, the theory of e-Government evolution" (Cf. Bélanger & Carter, 2012, p. 379). In particular, we develop a new theory of e-Government evolution that we label the trajectory-turning point theory. Not only does this theory describe how e-Government evolves over time. It also explains why e-Government evolves the way it does which, in turn, is a pre-requisite for understanding the e-Government strategizing process[1].

The trajectory-turning point theory is similar to the Punctuated Socio-technical IS Change (PSIC) theory introduced in the IS literature (Lyytinen & Newman, 2008) because both theories stress the alternation between long periods of incremental change which are punctuated by shorter bursts of radical change. While PSIC is a multi-level theory that

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[1] In what follows, we use the word "theory" to refer to explanatory theory, that is, a theory that "explains primarily how and why some phenomena occur." (Gregor, 2006, p. 624). We also distinguish between capabilities and generative mechanisms, the former being both organizational abilities and specific actions undertaken to adapt to environmental change, the latter being conceptualized as "motors" or key drivers of change.

interweaves evolutionary and teleological drivers (Van de Ven & Poole, 1995, p. 530-531), the trajectory-turning point theory shows that change occurs through an evolving interplay of generative mechanisms. For example, in the case under investigation, workarounds to existing electronic exchanges emerged in response to the Courts' unexpected adoption of case management systems. Such workarounds, in turn, triggered a teleological "motor" aimed at enabling the collaboration between Police, Crown Prosecution Service (CPS), and Courts *post hoc*. Hence, the new vision of inter-organizational collaboration emerged retrospectively when the CPS developed a rendering functionality that enabled the production of standardized forms capable of balancing the (dialectical) tension between the benefit of technological integration and the reality of institutional fragmentation.

In addition, this paper proposes an adaptive approach to standardization where new standards emerge in response to the need for interoperability across domains (Hanseth & Bygstad, 2015). This, in turn, fosters innovation because consensus is developed *ex post* rather than *ex ante* (Ibid). In practice, this argument casts a long shadow on the use of maturity (or stage) models because they serve as rationalistic "planning instruments" for the development of "anticipatory standardization strategies" rather than more emergent strategies (Ibid). Furthermore, our argument shifts the focus from the development of dynamic capabilities required to move to the next stage of e-Government evolution (Klievink & Janssen, 2009) to improvisational capabilities best suited for coping with unpredictable environments (Galliers, 2006; Molnar et al., 2017; Pavlou & El Sawy, 2010). Improvisational capabilities require an ability to react to novel events and environmental surprises in the absence of prior planning (Pavlou & El Sawy, 2010). In contrast to dynamic capabilities that fit well within environments with predictable patterns of change, improvisational capabilities are best suited when the environment becomes highly turbulent (Ibid, p. 444), thus revolving around a logic of "spontaneous responsiveness" (Ibid, p. 451/452) to act in a narrow "window of opportunity" in an unstructured, emergent, and urgent fashion (Ibid).

The remainder of this paper is organized as follows. Section two reviews several e-Government maturity models and explains the rationale for choosing the Davison's et al. (2005) alignment-based maturity model as our focal model. Section three introduces our research strategy and the timeline of events toward e-Government transformation. Section four analyzes the empirical data by identifying the trajectories of Joined-Up Government and e-Government Transformation, as well as showing the trajectory-turning point theory in action. Section five discusses both theoretical and practical implications stemming from this paper. Section six brings the paper to a close with a discussion of possible avenues for future research and the limitations of this work. The Appendices list a broad array of e-Government maturity models and a summary of data collection methods.

2. THEORETICAL BACKGROUND

E-Government is "the use of IT to enable and improve the efficiency with which government services are provided to citizens, employees, businesses and agencies" (Bélanger & Carter, 2012, p. 364). While IT can be used to support service delivery to citizens (G2C), other Government organizations (G2G), employees (G2E) and businesses (G2B), in this study we take an internal perspective that focuses on service delivery to Government organizations and employees rather than businesses and citizens (Siau & Long, 2005). Arguably, the integration of internal business processes and technological infrastructures is an essential step for enhancing external services to businesses and citizens (Andersen & Henriksen, 2006; Lee, 2010).

Back-end systems integration has turned out to be a critical success factor for achieving a mature level of e-Government (Lam, 2005; Gottschalk & Solli-Saether, 2008; Gottschalk, 2009). Nevertheless, the variety of maturity models available (Valdés et al., 2011) calls for a more nuanced review of maturity models research that is aimed at models of e-

Government evolution (Ibid, p. 178). These models are native models specifically "built within the e-Government field/literature" (Bannister & Connolly, 2015: 6). Since these models "serve as *mediators* between theories and data" (Van de Ven, 2007, p. 144; italics in original), they provide useful insights with regard to their overarching process theories. In particular, most e-Government maturity models may be interpreted as being energized by life-cycle "motors" with glimpses of teleological drivers (Lasrado et al., 2015; Poeppelbuss et al., 2011). Using the life-cycle perspective as a key driver of change, several maturity models have been proposed in the literature (e.g., Andersen & Henriksen, 2006; Baum & Di Maio, 2000; Davison et al., 2005; Deloitte Research, 2000; Fath-Allah et al., 2014; Gottschalk, 2009, Guijarro, 2007; Janowski, 2015; Janssen & Veenstra, 2005; Layne & Lee, 2001; Lee, 2010; Moon, 2002; Netchaeva, 2002; Siau & Long, 2005; Valdés et al., 2011; West, 2004; etc.)[2].

The Layne and Lee's (2001) model is probably one of the most-widely cited models because it looks at complex issues of both vertical and horizontal integration across different government levels and disparate government functions and services. Put simply, this model argues that e-Government development moves along four developmental stages which encompass: 1) cataloguing (e.g., online presence, downloadable forms, etc.); 2) transactions (i.e., working databases supporting online transactions); 3) vertical integration (i.e., lower-level systems interoperating with higher-level systems within the same function); and 4) horizontal integration (i.e., IT systems interoperating across disparate business functions). Notwithstanding their focus on data integration issues and technical matters, Layne and Lee (2001) identified three core challenges for efficient and effective e-Government evolution, namely (1) universal access; (2) privacy and confidentiality; and (3) citizen focus in Government management.

Spurred by the Layne and Lee's (2001) model, e-Government scholars have endeavored to extend this model in different directions. For example, Andersen and Henriksen (2006) proposed an e-Government maturity model which switches the focus on the front-end of Government and away from back-end, data integration issues. Dubbed the Public Sector Process Rebuilding (PPR) maturity model, Andersen and Henriksen's (2006) model shows that the digitalization of e-Government services follows a "progressive growth model" from cultivation, through extension and maturity toward revolution. Along the same lines, West (2004) has argued that e-Government falls along a continuum from transformation to incrementalism, the former being a large-scale shift, the latter a small, incremental shift. He also argued that there are four general stages of e-Government development, namely (1) the billboard stage where web sites serve the function of highway billboards; (2) the partial-service-delivery stage where citizens can execute only a handful of services online; (3) the portal stage with fully-executable and integrated service delivery and (4) the interactive democracy stage with public outreach and accountability-enhancing features.

Taking Municipalities as a unit of analysis, Moon (2002) has argued that there are various stages of e-Government evolution that reflect the degree of technical sophistication and interaction with users, namely: (1) simple information dissemination (one-way communication); (2) two-way communication (request and response); (3) service and financial transactions; (4) integration (horizontal and vertical integration); and (5) political participation. Moon (2002) also suggested that the adoption of e-Government practices may not follow a true linear progression (e.g., a Government may initiate stage 5 of e-Government, i.e., political participation, without full practice of stage 4, i.e., integration) and that Municipalities can also pursue various stages of e-Government simultaneously. Likewise, Siau and Long (2005) have proposed a new e-Government stage model

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[2] Due to space limitations, and being mindful of the trade-off between simplicity, generality, and accuracy (Langley, 1999; Weick, 1979), in the following paragraphs we review only a handful of high-impact maturity models. Nevertheless, we have listed a broader array of e-Government maturity models in a more simple and general fashion in Appendix A.

encompassing five stages, namely (1) web presence; (2) interaction; (3) transaction; (4) transformation and (5) e-democracy with a big jump between the first three stages and the last two as "the first three stages purpose [is] to automate and digitalize the current processes, while the last two stages aim at transforming government services, reorganizing the internal operational process, and re-conceptualizing the way citizens participate in government decision-making" (Ibid: p. 455). Nevertheless, their proposed model presents a "development trend" rather than a "must-go path" because "it is not necessary that every country goes through the whole five stages step by step" (Ibid, p. 456). Gottschalk (2009), on his part, has challenged these insights by arguing that predictable patterns (conceptualized in terms of stages) exist in the growth of organizations and that "these stages are (1) sequential in nature, (2) occur as a hierarchical progression that is not easily reversed, and (3) involve a broad range of organizational activities and structures" (Ibid, p. 77). Based on extant literature on maturity models and systems interoperability, Gottschalk (2009) proposed a five stage model encompassing (1) computer interoperability; (2) process interoperability; (3) knowledge interoperability; (4) value interoperability and (5) goal interoperability. Using the interoperability lens, Guijarro (2007) has conceptualized a two-phase interoperability roadmap, consisting of (1) enabling interoperability based on interoperability frameworks aimed at "providing the basic technical standards and policies to enable the seamless flow of information between different administrations in the delivery of e-services" (Ibid, p. 100); (2) aligning administrative procedures with technical systems by using enterprise architectures to contribute to interoperability at the organizational level between different administrations.

Janowski (2015), on his part, has developed a Digital Government Evolution model. According to this model, e-Government evolution follows a four-stage trajectory with each stage representing a necessary step for the follow-up stage. More specifically, the first stage is a stage of Digitalization where existing processes, services, and practices are digitized and automated with the purpose of serving the same stakeholders and customers through digital networks. In the second stage, a Transformation of existing processes, services, and practices occurs with the aim of improving them. The improvement of internal structures, processes, and working practices often takes place as part of a larger administrative and institutional reform in Government and aims at "internal efficiency, effectiveness, rationalization and simplification" (Ibid, p. 226). In the third stage, Government organizations pursue a wider Engagement with citizens, businesses, and other non-government actors using digital technologies. In the fourth, and final stage, Contextualization occurs and Digital Government becomes "a vehicle for social, economic, political, cultural, etc. development in line with the needs and aspirations of countries, cities, communities and other territorial and social units and their people" (Ibid, p. 228).

Likewise, Lee (2010) compared the Layne and Lee's (2001) model with several e-Government maturity models proposed by consultancy companies (Deloitte Research, Gartner Group) and academics (Hiller & Bélanger, 2001; Norris & Moon, 2005; Siau & Long, 2005) and proposed several stages of e-Government development depending on whether the focus is on front-end interfaces servicing citizens or back-end databases (i.e., operations and technology). More specifically, Lee (2010) coined several metaphors to capture front-end and back-end developmental stages ranging from 1) presenting (i.e., posting information on the digital domain) through 2) assimilating (i.e., replicating real-world processes and services on the digital domain), 3) reforming (i.e., restructuring real-world processes and services to match digital requirements), 4) morphing (i.e., embedding real-world processes and services in the digital domain) and, lastly, 5) e-Governance (i.e., managing processes and services in both worlds synchronously).

Moving along the same train of thought, Davison et al. (2005) argued that e- Government develops from initial rhetorical intentions through strategic planning, systems development, integration and finally transformation. Below we summarizes these e-

Government maturity models by showing that, though they are very different from one another, they do share a common background logic, namely the logic of process theory where necessary conditions provide a satisfactory explanation when they are combined in a "recipe that strings them together in such a way as to tell the story of how [the outcome] occurs whenever it does occur" (Mohr, 1982, p. 37). Process theory takes an event-driven approach because it provides explanations in terms of the sequence of events leading to an outcome (e.g., "go through stage A then B to get to the final maturity stage C"). Accordingly, necessary conditions are conceptualized as discrete stages (or sequences of events). Moreover, necessary conditions alone do not provide a full explanation. Akin to "ingredients" in a meal, "[t]here must also be some instruction for mixing them – a recipe. Recipes generally mandate activities that occur over time and in a prescribed order" (Ibid, p. 60). Hence, seen from the perspective of process theory, these models instantiate a general theory of process that revolves around a progressive, sequential, and prescriptive recipe that is wedded to a top-down planning logic (Coursey & Norris, 2008; Debri & Bannister, 2015; Sandoval-Almazán, R., & Gil-Garcia, 2018). Table 1 summarizes these insights from the perspective of process theory[3].

Author(s)	Number of stages, labels & trajectories
Layne & Lee (2001)	4 stages (i.e., Catalogue, Transaction, Vertical Integration and Horizontal Integration) evolving through a progressive, stepwise, and prescriptive trajectory (e.g., cataloguing is required to support online transactions. However, online transactions improve upon cataloguing. Furthermore, "the four stages offer a path for Governments to follow" and, therefore, must occur in a prescribed order to achieve the envisioned end state of horizontal integration)
Andersen & Henriksen (2006)	4 stages (i.e., Cultivation, Extension, Maturity and Revolution) evolving through a "progressive growth" trajectory (e.g., external extension of database services is an improvement upon internal database cultivation)
West (2004)	4 stages (i.e., the Billboard stage, the Partial-Service-Delivery Stage, the Portal Stage and the Interactive Democracy Stage) showing "how much progress public sector agencies have made" (e.g., the partial-service-delivery stage is an improvement of the billboard stage where "officials treat Government Web sites much the same as highway billboards, that is, static mechanisms to display information")
Moon (2002)	5 stages (i.e., Simple Information Dissemination, Two-Way Communication, Service and Financial Transactions, Integration and Political Participation) implicitly evolving in a progressive and stepwise trajectory (e.g., if "not many Municipal Governments have reached stage 3, it is assumed that few Municipalities have entered stage 4 or 5")
Siau & Long (2005)	5 stages (i.e., Web Presence; Interaction; Transaction; Transformation and e-Democracy) evolving through a progressive trajectory (e.g., interaction "provides a progressively complex interaction between Governments and Users" that is superior to a more simple Web Presence in terms of benefits/costs)
Gottschalk (2009)	5 stages (i.e., Computer Interoperability, Process Interoperability, Knowledge Interoperability, Value Interoperability and Goal Interoperability) evolving in a progressive and stepwise trajectory

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[3] In process theory, the occurrence of the sequence of stages is probabilistic rather than deterministic because explanation "rests ultimately on a metaphysical belief in the operation of the laws of chance" (Mohr, 1982, p. 51). Hence, a stage may be skipped even though it is "almost always" necessary for the outcome of interest (Lasrado et al., 2016). Likewise, the outcome may not occur even in the presence of the full sequence of necessary stages (Ibid).

	(e.g., process interoperability presupposes computer interoperability, that is, it entails that technical and semantic issues are solved while moving "organizational interoperability" to a higher level)
Guijarro (2007)	2 stages (i.e., Enabling Interoperability and Aligning Administrative Procedures with Technical Systems) evolving in a progressive and stepwise trajectory since enterprise architectures used to align administrative procedures with technical systems show "the highest degree of maturity among the e-Government initiatives under study." Nevertheless, phase 2 presupposes phase 1 (as alignment presupposes an enabling interoperability framework)
Janowski (2015)	4 stages (i.e., Digitalization, Transformation, Engagement and Contextualization) evolving through a progressive and stepwise trajectory (e.g., digitalization of existing business processes is a pre-requisite for their follow-up transformation. Nevertheless, transformation aims at improving digitized processes, services, and practices)
Lee (2010)	5 stages (i.e., Presenting, Assimilating, Reforming, Morphing and e-Governance) evolving through a progressive trajectory (as "not every Government has to go through stage one to stage five in terms of implementing e-Government-related technologies or systems")
Davison et al. (2005)	5 stages (Rhetorical Intention, Strategic Planning, Systems Development, Integration and Transformation) evolving through "typical transition paths" leaving out the possibility of e-Government adoption "without a plan". Each stage improves upon and requires the prior stage. Furthermore, this model can be used "as a diagnostic tool to establish the current e-Government position of a country or jurisdiction", as well as "a guide to future e-Government developments"
Overarching themes: From the perspective of process theory, these models revolve around a progressive, sequential, and prescriptive (planning) logic (Coursey & Norris, 2008; Debri & Bannister, 2015; Sandoval-Almazán, R., & Gil-Garcia, 2018) because they are energized by life-cycle "motors" (i.e., linear and irreversible change) with glimpses of teleological drivers (i.e., change toward an envisioned end state)	

Table 1. Examples of e-Government maturity models viewed through the lens of process theory

Considering that maturity is an unpredictable process rather than an ultimate goal (Galliers & Sutherland, 1991), a unifying theory of e-Government evolution is sorely missing in the e-Government literature. The remainder of this paper endeavors to address this research gap by developing a new theory of e-Government evolution that draws on the complex interplay of generative mechanisms beyond life-cycle and teleological drivers.

2.1 THE DAVISON'S ET AL. (2005) ALIGNMENT-BASED MATURITY MODEL

Drawing on several maturity models (e.g., Chen, 2002; Galliers & Sutherland, 1991; Luftman, 2000; Nolan, 1979; etc.), as well as the idea of a closer fit (or alignment) between the social (e.g., business processes, operations, strategies, etc.) and the technical aspects (e.g., data standards, interfaces, IT functionalities, etc.) (e.g., Henderson & Venkatraman, 1993), Davison et al. (2005) claim that there are three "typical transition paths" from Government to e-Government. The first path is a "strategically-aligned" journey where Government strategy is driving IT implementation. This path requires significant management insight, revolves around a rationalistic approach, and may be characterized by long delays in demonstrable benefits. Nevertheless, this pathway ensures a strategic alignment between Government strategy and e-Government strategy thanks to the

development of e-Government infrastructures and processes aptly integrated with the underpinning strategy and e-Government vision. This path should lead to full-blown e-Government transformation when Government infrastructures and processes change accordingly. Figure 1 depicts this pathway.
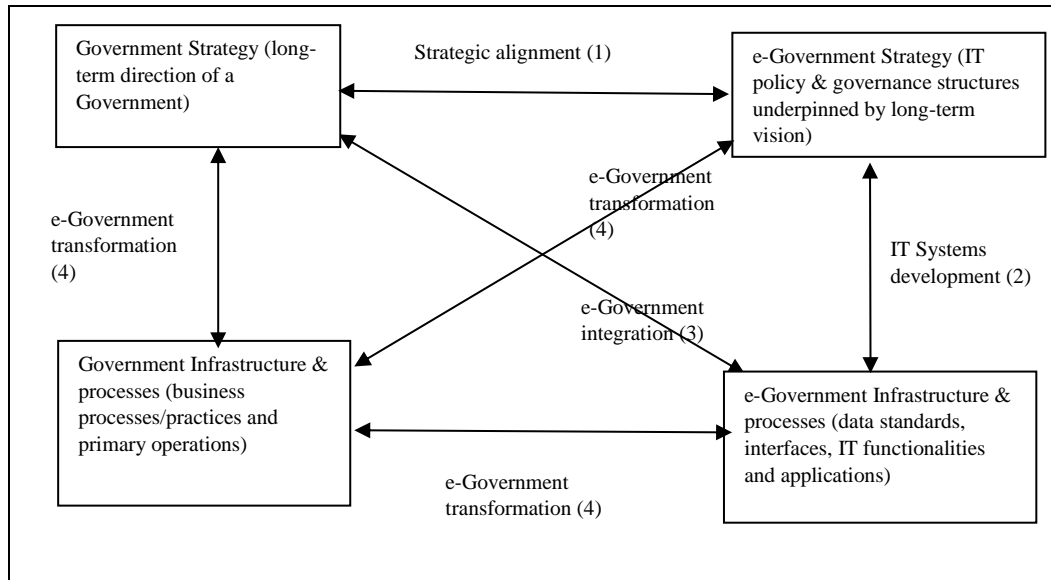

Figure 1. Alignment-based maturity model. Strategically-aligned path (Source Davison et al. 2005)

In addition to the "strategically-aligned" journey, Davison et al. (2005) have envisaged two pathways, namely 1) the IT-takes-leadership path and 2) the operationally-driven pathway. Though both pathways revolve around the alignment between e-Government strategy and IT infrastructure and processes (i.e., dubbed e-Government automation in Davison's et al. paper), their starting points are different depending on whether the e-Government vision or the IT systems focus is in the driving seat. Accordingly, the IT-driven path features technically well-planned e-Government infrastructures that need to be continuously re-developed in the operationally-driven path. Though both pathways suffer from lack of buy-in from some political stakeholders, the operationally-driven path demonstrates immediate show pieces and success stories. Once again, e-Government transformation occurs when Government infrastructures and processes change in response to the new Government strategy and vision of e-Government automation. Figure 2 depicts these pathways. It is worth stressing that e-Government automation can either start with e-Government strategy or with e-Government infrastructures and processes.
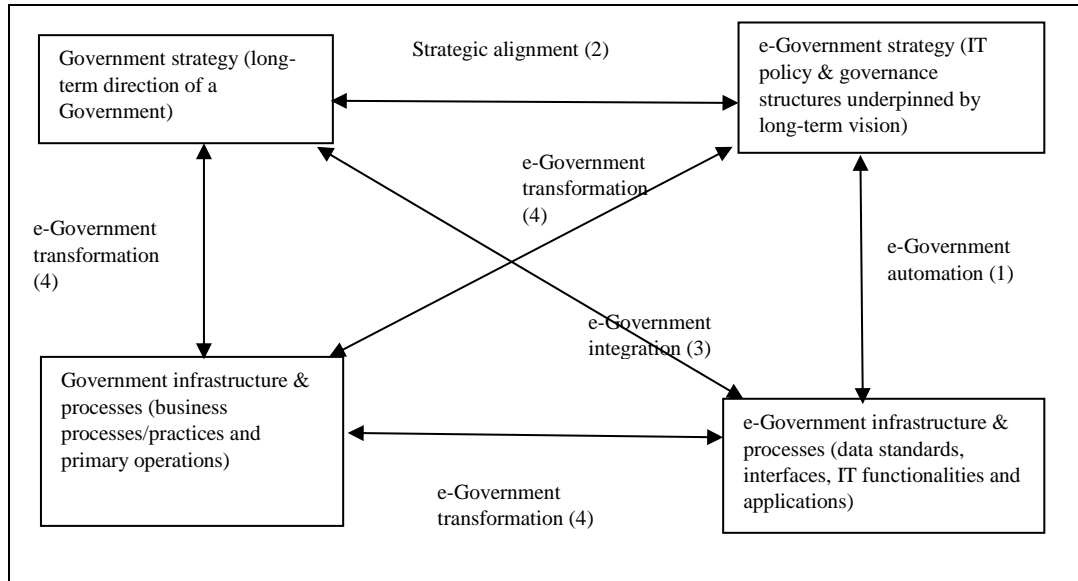
Figure 2. Alignment-based maturity model. IT-takes-leadership or operationally-driven path (Adapted from Davison et al. 2005)

In the remainder of this paper, we draw on the Davison's et al. (2005) model because it leverages the idea of alignment (or fit) between the social (or strategic) domain and the technical domain (Chan & Reich, 2007). By combining the perspectives of maturity and strategic alignment models, we believe that we are better equipped to address the intricacies and complexities of public sector projects (e.g., the mutual shaping of policy initiatives and e-Government infrastructures occurring at multiple bureaucratic levels, frequent policy changes tied to short-term election cycles, etc.). We are also interested in revisiting the differing transition pathways toward e-Government maturity because Davison et al. (2005) have entertained the possibility of bottom-up e-Government transformation but they did not pursue this possibility empirically. Informed by a top-down approach to strategic-alignment management (Avison et al., 2004; Karpovsky et al. 2014; Renaud et al., 2016), Davison et al. (2005) dismissed the possibility that transformational change in Government infrastructure and processes may be part of the triggering process arguing that "this would be highly risky and of little value, as it requires culture and value changes in Government without a plan, and without any immediate, demonstrable benefits in e- Government service provision" (Davison et al., 2005: 289-290). Other scholars too have echoed this message by highlighting the role of strategic plans tied to specific goals and visions (Gil-Garcia et al., 2005; Klievink & Janssen, 2009; Pardo et al., 2012). Yet e-Government visions, plans, and policies may be makeshift achievements which are subjected to ongoing development (Lanzara, 2009; 2013). By embracing the idea of planning as a means to a pre-defined end (or goal), these scholars put an unnecessary teleological spin on their approach to e-Government strategy, thus dismissing more emergent approaches revolving around improvisation as a key driver of change.

3. METHODOLOGY: RESEARCH STRATEGY AND DATA COLLECTION METHODS

This study centers on an in-depth investigation of the historical transition of the English system of criminal justice toward full back-end digitalization. We chose a single, longitudinal case study (Pettigrew, 1990) as our research design because we wanted to provide a thick description of the historical transition toward full back-end digital justice integration with a particular focus on the strategic and operational issues affecting the Police, the CPS, and the Courts. This transition was investigated over a period of 12 years

spanning from 2003 to 2015 to describe relatively-stable sequences of events punctuated by radical shifts (Abbott, 2001). This case was purposely selected because it revealed the barriers to e-Government adoption, that is, real-world issues that e-Government scholars have yet to contemplate in the development of their maturity models (Coursey & Norris, 2008; Madsen et al., 2014). Accordingly, we took the transition or change process as our unit of analysis to capture both triggers (or enablers) of change and barriers to change (or inhibiting factors). We used an embedded unit of analysis to investigate such barriers because operational barriers were clearly part of a broader set of historical and institutional issues (e.g., fragmentation of Police forces). Likewise, Government infrastructural triggers were part of a broader Government strategy aimed at achieving joined-up Government.

We used a narrative approach as our research strategy to describe the processes observed on the surface level (Langley, 1999; Pentland, 1999; Poole et al., 2016). As Langley (1999, p. 695) claims, this sense-making strategy may be used as a "preliminary step aimed at preparing a chronology for subsequent analysis – essentially, a data organization device that can also serve as a validation tool." Accordingly, we blended the narrative strategy with both temporal-bracketing and visual-mapping techniques to decompose the process under investigation into visually-ordered "phases" that helped us detect mechanisms of temporal evolution "without presuming any progressive developmental logic" (Ibid, p. 703).

During our fieldwork, we interviewed 17 informants for an average of 60 minutes each. We also conducted 6 mini focus groups and 6 observations (average duration 150 minutes and 240 minutes respectively). Both interviews and focus groups followed a structured format aimed at investigating governance arrangements, organizational practices, technology used and interoperability between and among systems. Observations instead focused on business processes and their contingent work arrangements. During observations, brief notes were taken relating to what was observed, and observations also became an important part of interview and focus group discussions.

An exclusive range of practitioners were interviewed including, among others, members of the Criminal Justice Information Technology (CJIT) Organization, Business Consultants, Business Architects, Benefits Managers, as well as Heads of Business Change and Digital Business. We triangulated primary data with several reports and legal documents. We also asked both Prosecutors and Business Consultants to validate our findings[4].

We used a "temporal bracketing" strategy to decompose the transition process into separate "phases" or "stages" and unpack the overarching patterns of events which accounted for the processes observed on the surface level (Langley, 1999). We analyzed our data during and after data collection through the critical incident chart, that is, a technique used to organize the listing of events in time by focusing on those "events seen as critical, influential, or decisive in the course of some process" (Cf. Miles & Huberman, 1994, p. 115). Specific events were meticulously analyzed only when there were instances of occurrences given by at least two informants with no evidence of disconfirmation of such occurrences in the empirical data (Miles & Huberman, 1984, p. 26). To begin with, all events were entered into NVivo and coded using open coding techniques (Corbin & Strauss, 1990) to label them in a chronological fashion (Cf. Miles & Huberman, 1994, p. 115). This allowed for some flexibility in data collection as several events were coded but only a few, critical ones were examined more deeply. For example, "the CPS showed an early commitment to the digital agenda in 2010-11 when it began to upgrade its existing technology infrastructure and software in preparation for its Transforming Through Technology (T3) program (HMCPSI-HMIC, 2016, p. 4). Yet this within-agency program was eclipsed by the Criminal Justice System Efficiency Program that was launched in 2011 as a cross-agency program "with shared targets, senior leadership, and strong support

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[4] Please see Appendix B for details of our data collection methods.

across the departments and lead delivery agencies" (Program Manager, Criminal Justice System Efficiency Program). Accordingly, the emergence of the Criminal Justice System Efficiency Program was regarded as a more critical event in the transition toward full back-end digital justice integration in England.

Subsequently, we clustered these critical events (or occurrences) into visually-ordered "phases" or "stages" in accordance with Davison's et al. (2005) model. These "phases" (or "stages"), in turn, were grouped into more holistic patterns to capture overarching trajectories that portrayed a more general description of events rather than "phases" of a "predictable sequential process" (Langley, 1999, p. 703). As a result, we moved from surface raw data about sequences of events to overarching patterns that were not directly observable (Ibid). Two core trajectories emerged during data analysis, namely an initial trajectory toward Joined-Up Government followed by a subsequent trajectory of e-Government Transformation. Each trajectory was characterized by a relatively-stable sequence of events, but the shift between trajectories revolved around a turning point (Abbott, 2001) that marked the transition from a parochial view of progressive e-Government improvements to a broader and more encompassing vision of end-to-end e-Government. Table 2 summarizes the critical incidents characterizing each trajectory.

Trajectory 1 (Joined-Up Government Initiative: sequential and reciprocal integration thanks to one-way/two-way links between Police and CPS)	Trajectory 2 (e-Government Transformation: end-to-end links with full integration between Police, CPS, and Courts)
• 2003-2004: Joined-up working between Police and CPS underpinned by Criminal Justice Act (2003) and Statutory Charging (2004) • 2005: Creation of Criminal Justice Information Technology Organization (CJIT) to ensure 1) secure email exchanges between Police and CPS; 2) interoperability between their systems • 2005-2011: Roll out of case management systems within Courts by replacing old legacy systems. However, Courts became late adopters because they struggled to replace old legacy systems (mostly paper based) • 2005-2008: Design of the Criminal Justice System Exchange (CJSE) and implementation of the one-way interface underpinned by a set of data standards to support the flow of case file information from the Police to the CPS • 2009-2011: Design of the two-way interface between Police and CPS underpinned by new data standards supporting the bilateral exchange of case file information to/from the CPS. Implementation of the two-way interface in three Police forces (i.e., Greater Manchester, West Midlands, and South Yorkshire) between 2010-2011 • 2010-2011: Development of rendering functionalities within the CPS to email PDF files to Courts and Defense	• 2011: Launch of the Criminal Justice System Efficiency Program with the aim of creating a Collaborative Digital Platform and a National File Standard based on shared data standards overseen by the National Criminal Justice Board (Source: de Blok et al., 2014) • 2012: Open Standards principles informing new e-Government policies: all criminal justice system agencies and future reform projects aiming to utilize shared open standards to facilitate one joined-up and transparent criminal justice system where information is readily available to third parties and integration and interoperability is the norm (Source: Criminal Justice System, 2014, p. 24) • 2014: first implementation of a structured (or streamlined) digital case file for the exchange of written information between early adopter Police forces and the CPS (Source: HMCPSI-HMIC, 2016, p. 7) • 2015: proof of concept of the Collaborative Digital Platform with the aim of moving away from the transfer of unstructured data (i.e., photographs, videos, etc.) between CPS and Courts' systems by making them available in one shared digital repository (Source: HMCPSI-HMIC, 2016, p. 14)

Table 2. Critical events in the transition toward full back-end digital justice integration in England

4. THE CASE STUDY

The criminal justice system in England encompasses several organizations ranging from the Police, the CPS, the Courts and the Prisons and the Probation Service. These organizations are endowed with different structures and report to different Ministerial departments. The Police report to the Home Office, the CPS to the Attorney's General while the Courts, Prison, and Probation Service are accountable to the Ministry of Justice. There is also a special Minister for Policing, Fire, and Criminal Justice and Victims that works across the Home Office and the Ministry of Justice.

Triggered by the fragmentation of public services and budget pressures in the late 1990s, the Blair Government made a deliberate effort to coordinate activities across organizational boundaries in a joined-up fashion. The result was a new vision (i.e., the Third Way) and a new strategy (i.e., Joined-Up Government) which radically re-structured the internal life of public sector organizations, their interactions, their approach to service delivery and their overall accountability (Brown et al., 2014; Chadwick & May, 2003; Ling, 2002; Margetts & Dunleavy, 2013). This Government strategy, in turn, deeply affected the organization of the criminal justice system in England because it fostered inter-organizational cooperation between the Police and the CPS to improve information-sharing activities.

Spurred by this new Government strategy, the Parliament enacted the Criminal Justice Act 2003 that ratified a new Charging Scheme (i.e., Statutory Charging) that made consultation a key part of joined-up working between the Police and the CPS (i.e., *Government transformation*). The first edition of Statutory Charging issued in May 2004 explicitly prescribed face-to-face consultations between police investigators and duty prosecutors (i.e., crown prosecutors working within police stations) by maintaining that "early consultations with crown prosecutors will provide an opportunity for advice to be obtained on the charges likely to proceed in any case and the evidence that will be required to support those charges, as well as enabling evidentially weak cases to be identified and concluded early" (The Director's Guidance on Charging, 2004, p. 2). Informed by this legislative change in social practices, the Police and the CPS endeavored to create new governance structures underpinning the development of their IT infrastructure. Accordingly, this transformational change in Government infrastructure and processes started new trajectories of e-Government maturity that are analyzed in more detail in the following Sections.

4.1. ANALYSIS OF THE CASE: THE JOINED-UP GOVERNMENT INITIATIVE (TRAJECTORY 1)

Above we have argued that Davison's et al. (2005) model provides a compelling rationale for the transition from Government to e-Government because it revolves around the idea of alignment (Andrade & Joia, 2012). Figure 3 outlines this model in the context under investigation. It shows that the Statutory Charging Scheme produced a *transformation* of criminal justice because it fostered early consultations between police officers and duty prosecutors (see double-headed arrow labelled "*Government transformation – Statutory Charging Scheme* (1)" in Figure 3)[5].

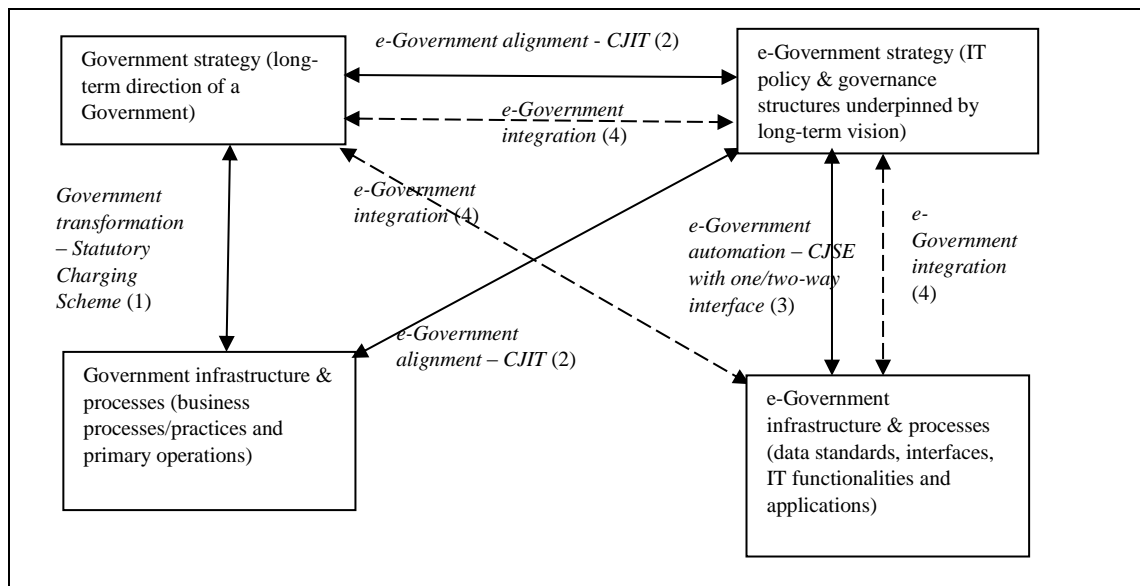[5] All events along regular stages are reported in italics.

Figure 3. Alignment-based maturity model (Solid arrows: trajectory 1; Dashed arrows: trajectory 2. Adapted from Davison et al. 2005).

We have also critiqued Davison's et al. (2005) rationalistic approach to strategic alignment which downplays more emergent, bottom-up forms of alignment (Ciborra, 2000; Lanzara, 2009; Yeow et al., 2018). In our view, the case under investigation shows that the alignment of e-Government strategy with Government infrastructures and processes is not only a theoretical possibility but is a reality because of the fragmented nature of the criminal justice system. Criminal justice system organizations have historically benefited from a high degree of independence from each other (de Blok et al., 2014). The historical independence between and among the disparate criminal justice system organizations, in turn, has become a formidable barrier to top-down planning because it has created invisible barriers in terms of divergent objectives, as well as different data ownership and retention policies. These invisible barriers have been exacerbated by the institutional autonomy of Police forces which, though coordinated by the National Police Chiefs Council on issues such as finance, human resources and IT, have embarked on different projects rather than developing one national Police system. As an informant explained:

Police forces are like 43 independent organizations competing with each other when it comes to suppliers. Each Police force has different requirements and procurement systems. There are three key suppliers but out of 43 forces there are at least 40 forces with their own ICT function. When there is one system being used over 20 forces, there are 20 variants of the same IT system (Head of Police ICT Company).

Against this backdrop of historical and institutional fragmentation, the Police and the CPS soon realized that, in the context of joined-up working, their most pressing need was not for a technological tool but for a governance structure to evaluate alternatives, consider divergent views, and make decisions about the joint responsibility for IT protocols and policies. An informant specifically claimed:

At the strategic level, the management of the IT infrastructure was part of the joining-up justice initiative which was overseen by CJIT [Criminal Justice Information Technology Organization] in terms of overall protocols and policies. There was a lot of collaboration between Police and CPS within the remits of CJIT while commercial contractors were responsible for the software and for maintenance of the infrastructure (Business Consultant, CJIT).

In a context of historical and institutional fragmentation between and among Police forces, therefore, Police and CPS decided to create a cross-organizational governance structure called CJIT with the purpose of overseeing IT protocols and policies aimed at fostering the joined-up working initiative predicated upon the Statutory Charging scheme (i.e., *alignment* of e-Government strategy with Government strategy and Government infrastructure and processes. See double-headed arrows labelled "*e-Government alignment - CJIT* (2)" in Figure 3). Little wonder that CJIT oversaw the development of the CJSE to promote joined-up working between Police and CPS. As an informant remarked:

> The CJSE [Criminal Justice System Exchange] was designed as a system to take information from the Police case management systems and route it to the CPS. The basic idea was that the Police through their case management systems would send their initial full file material to the CJSE which would route this material to the CPS… We wanted to take information from the Police systems and use it to populate the CPS case management system so that administrative staff were not re-keying into this system information that the Police had already keyed into their systems (Benefits Manager, CJIT).

Accordingly, Police and CPS decided to inscribe their consultations in the case management systems in a one-way fashion in synch with the traditional flow of evidential material (i.e., *e-Government automation*. See double-headed arrow labelled "*e-Government automation – CJSE with one/two-way interface* (3)" in Figure 3). As a result, the one-way interface between Police and CPS was designed:

> The one-way interface was introduced to connect [local] Police information systems with the [national] information system of the CPS. This interface provides a system for transferring structured information, e.g. personal information about the defendant, victim(s) and witnesses, and evidential material, e.g. witness statements. The one-way interface made it possible for the CPS to receive information about criminal cases (from the criminal case file in the Police systems) straight away in their own system, without re-keying of information… The introduction of the one-way interface was enabled by the largely defined and standardized exchange of required information between the Police and the CPS as arranged through the Prosecution Team Manual of Guidance (de Blok et al., 2014, p. 239)

However, the inscription of Police-CPS consultations in a one-way fashion turned out to be an intermediary step toward a deeper level of e-Government automation because some Police forces started experimenting with a two-way interface with the CPS to develop a bilateral exchange of file information (i.e., *e-Government automation*. See double-headed arrow labelled "*e-Government automation – CJSE with one/two-way interface* (3)" in Figure 3). One informant in particular remarked:

> Our links with the Police have recently been extended to enable a pre-charge information exchange between Police and CPS in a two-way fashion. On a non-two-way interface Police force, charge information will go back to the Police on a document and then a person will have to input that information into the Police system and give the various tasks to Police officers. Instead, all of this now goes back to a few Police forces as structured data and populates the Police systems automatically with the action plan (Crown Prosecutor, Criminal Justice System Efficiency Program).

In a context where consultations between Police and CPS had become a key part of joined-up working, both CPS and Police realized the benefits deriving from reducing duplicate data entry and handling. As an informant explained:

> In the two-way interface, once the CPS decision has been made, the CPS can use the case management system to send the decision back to the Police electronically. The CPS only needs 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 on both ends (Program Manager, Criminal Justice System Efficiency Program).

However, due to their independence, Police forces responded to the two-way interface project in different ways. An overwhelming number of Police forces stuck with the one-way interface because of the high up-front costs required to invest in the two-way interface (HMCPSI-HMIC, 2016). Three Police forces (i.e., Greater Manchester, West Midlands, and South Yorkshire) bought into this new way of working but they did not reap the expected benefits because of technical (e.g., limitations in terms of data size that could be transferred across the CJSE), organizational (e.g., lack of timely training), and cultural issues (e.g., police officers' tendency to overbuild the case file, duty prosecutors' tendency to over-ask for information, etc.). An informant summed up the core issue as follows:

> Part of the reason why TWIF [the Two-Way interface] has not worked is that you have a very fragmented [criminal justice] system with a lot of different agencies that have a degree of operational independence and constitutionally differ from each other. This does not necessarily mean that you have to work in silos, but in practice it does. Partly, that is because of the integrity of those operations and institutional boundaries. But, it is also because different organizations are working in different ways and have their own objectives (Adjunct Director of Criminal Justice System Business Strategy, Criminal Justice System Efficiency Program)

Far from being stuck in a rut, the e-Government infrastructure has slowly evolved. While the existing e-Government strategy focused upon improving joined-up working between Police and CPS, the e-Government infrastructure has gradually enabled a wider end-to-end communication flow thanks to the emergence of rendering functionalities that supported the transformation of data inputs into standardized forms. Since the Courts were struggling with the replacement of old legacy systems, they were not involved in the e-Government strategy at the outset. Nevertheless, a new standardization initiative emerged when the Courts adopted new case management systems. Specifically, this new initiative was about rendering structured data inputs from the Police into standardized Manual of Guidance forms to be emailed to other partners in the chain whether Defense or Courts. Accordingly, a new vision came into being that was based on improvement and innovation of end-to-end processes (i.e., *e-Government integration*. See double-headed arrows labelled "*e-Government integration* (4)" in Figure 3).

4.2. ANALYSIS OF THE CASE: e-GOVERNMENT TRANSFORMATION (TRAJECTORY 2)

So far the analysis has hinted that technological infrastructures are complex ensembles of social and technical components that, though initially designed, are the product of an emergent process (Lanzara, 2009). We label this process as a re-alignment process because e-Government infrastructures and processes align with e-Government strategy but over time they trigger the re-alignment of e-Government visions and pre-existing structural arrangements. More specifically, the evolution from the one-way/two-way interface to new technological functionalities in the case management systems marked a radical shift from a parochial view of interoperability between Police and CPS IT systems to a broader and more collaborative, end-to-end digital platform (i.e., the Collaborative Digital Platform). As an informant stated:

> The CJSE is a routing mechanism which takes case file information from the Police and passes it on to the CPS. This information is currently stored in several databases. In the future, we are looking at the development of the CJSE using Portal

Technology so that the CJSE may then start to store information within a data-service component that can then be shared with other organizations (Program Manager, Criminal Justice System Efficiency Program).

When the Courts deployed their case management systems (de Blok et al., 2014), the need for electronic communication transferred across domains (i.e., Police/Investigation, CPS/Prosecution, and Courts/Judiciary domain) and, therefore, standardization and inter-organizational communication techniques became critical (Edwards et al., 2009; Henningsson & Henriksen, 2011). As an informant recalled:

> While TWIF [Two-Way Interface] and XML [eXtensible Markup Language] were our primary standards for the provision of case material to CPS and CJSE, we developed a rendering functionality to ensure the production of PDF files that we could email to Defense, Courts, and others (Crown Prosecutor, Criminal Justice System Efficiency Program).

Another informant further clarified how they tweaked the electronic exchange of information to ensure the production of PDF files through this rendering process:

> We have agreed data standards, including offence specific questions for assault and retail theft. These standards have supported the Police capability to capture case information as structured data [inputs]. But they have also supported the CPS capability to render these structured data into a national format so that it can be reviewed and then served on other [criminal justice system] parties. In whatever way the Police key information in their systems, it should come out into a standard national format for Prosecutors, Judges, and Defense Practitioners (CPS Director of Digital Business Program).

The technological functionality of the CPS case management system to extract structured data inputs and transform them into a standard national format that could be emailed to the Courts, in turn, has prompted the emergence of a new end-to-end vision of digital justice because it has enabled disparate agencies to work together in a digital fashion across jurisdictions. In other words, the standardized forms acted as "boundary objects" travelling across disparate domains (or jurisdictions) and meeting localized needs (Star & Griesemer, 1989).

It is this technological functionality that served as a building block for a broader end-to-end e-Government strategy because it enabled the assemblage of structured data inputs into standardized forms to be sent to the Defense or Courts without impinging on their ownership of data. Accordingly, the case shows that the impromptu development of new rendering functionalities in the CPS case management system has produced a gap (or misalignment) between the pre-existing e-Government vision and the new functionalities of the technology (Lyytinen & Newman, 2008). While the pre-existing e-Government vision was focused on a parochial view of Police-CPS interoperability, the new rendering functionalities of the CPS case management system enabled a more collaborative mobilization of a wider range of agencies (Aanestad & Jensen, 2011). This gap, in turn, has marked a radical shift in e-Government strategy with the emergence of a broader end-to-end vision of full back-end digital justice integration. Far from being a straightforward process, developing a new IT vision turned out to be a long and difficult task (Edwards et al., 2007). An informant, in particular, explained that:

> It would have been nice to have all criminal justice system 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 Project Manager, Criminal Justice System Efficiency Program).

This same informant went on to explain the need for this new e-Government vision as follows:

> The main thing that has really worked when implementing [these] changes was taking an overall end-to-end criminal justice system perspective. This perspective was needed, since the party that invests money and effort in changes to its way of working does not always see the benefits. However, the benefits for the other criminal justice parties and therefore for the criminal justice system as a whole might be significant (Senior Project Manager, Criminal Justice System Efficiency Program).

As this new end-to-end vision emerged (Swanson & Ramiller, 1997), the Courts, the CPS, and the Police agreed to launch the Criminal Justice System Efficiency Program. Again, an informant explained that:

> Now, we've got a specific program of work to look just at integration work. This program of work is agnostic to agency boundaries, meaning that the siloed approach to technology transformation used so far has begun to be rectified by the common approach we're taking. The program also includes establishing data standards at a pan-justice level; this is different to simply 'setting standards', as it will address the underlying reasons why standards-alignment happens or doesn't happen by tackling division of responsibilities, and making data responsibilities clearer (Program Manager, Criminal Justice System Efficiency Program).

Accordingly, the parties decided to form a new Governance structure (i.e., the National Criminal Justice Board) with sub-groups responsible for delivering the work program agreed by the Board. Since creating an IT Steering Committee risked isolating IT issues from business imperatives, it was decided to create two technical sub-groups within the National Criminal Justice Board to foster communication between Business and IT Executives (Reich & Benbasat, 2000). Specifically, it was agreed that one sub-group should focus on offences and the other sub-group on recording the outcomes arising from Court hearings. As an informant explained:

> We have created two sub-groups within the [National Criminal Justice] Board. They gradually define the standard-agreed wording when charging for offences and recording the outcomes arising from criminal Court hearings. Both groups liaise with their respective Heads of CPS, National Police Chiefs Council, and Courts when designing data standards (Deputy Chief Constable, Criminal Justice System Efficiency Program).

Therefore, the case shows that the criminal justice system parties moved from a technical solution to a social fix in their process of e-Government transformation as they shifted from standardized forms to producing a set of common data standards formally agreed by the technical sub-groups within the National Criminal Justice Board (i.e., *e-Government integration*. See double-headed arrow labelled "*e-Government integration – National Criminal Justice Board setting shared data standards* (4a)" in Figure 4). Rendering a standardized form was a technical issue but agreeing common data standards required that the criminal justice system organizations worked together to define common definitions (Henningsson & Henriksen, 2011; Hanseth & Bygstad, 2015).

Not only have the rendering functionalities enabled the emergence of the end-to-end e-Government vision underpinning the Criminal Justice System Efficiency Program with its new e-Governance structure. They have also spawned the emergence of a new Government strategy revolving around open standards (Cabinet Office, 2015) and "vagued-up" open data, that is, the rendering of data sets (or structured data) into linked data which have been vagued up and aggregated (O'Hara, 2014) (i.e., *e-Government integration*. See double-headed arrows labelled "*e-Government integration – open data/standards* (4b)" in Figure 4). Though the "rendering" functionalities were at first based on standardized forms sent

through secure email technology (i.e., TCP/IP and XML standards), they slowly started to hinge on digital case files exchanged by means of JSON [JavaScript Object Notation] standards. An informant specifically claimed that:

> We have come up with the concept of digital case file so that police officers can capture the totality of information through a set of information fields which populate the case file sent to the CPS or Courts rather than the traditional set of [Manual of Guidance] forms. This information is assembled and formatted in a standardized fashion before being transferred across the [Criminal Justice System] Exchange. The digital case file initiative chose JSON for data formatting purposes (Business Consultant, Focus Group).

The combination of a new Government strategy with a new e-Government vision based on JSON standards, in turn, has enabled the implementation of new business processes aimed at streamlining electronic exchanges between Police, CPS, and/or Courts (HMCPSI-HMIC, 2016). As an informant explained:

> The so-called streamlined digital case file is intended to be captured as structured data at the outset and shared in its entirety with the next partner in the chain whether the CPS or the Court. The streamlined digital case file is essentially a structured information package that is transferred across the CJSE and automatically retrieved by the CPS or Court (Business Consultant, Criminal Justice System Efficiency Program).

Another informant aptly captured how the streamlined digital case file initiative goes beyond emailing PDF files to relevant parties:

> Digitalization should not mean making a paper form into a PDF [file] and emailing it across to someone else in the criminal justice system. Specifically, it should not imply that poor [paper-based] practices and processes are just made digital (Crown Prosecutor, Criminal Justice System Efficiency Program).

Further to the implementation of the streamlined digital case file, both CPS and Courts conducted a proof of concept of the Collaborative Digital Platform to move away from the transfer of unstructured data by making them available in one shared digital repository (i.e., *e-Government transformation*. See double-headed arrows labelled "*e-Government transformation – streamlined digital case file & Collaborative Digital Platform* (5)" in Figure 4). Far from being the outcome of a plan, the streamlined digital case file and the Collaborative Digital Platform initiatives epitomize the essence of an improvisation mechanism. Not only were JSON standards slowly retrofitted in the new e-Government vision of full back-end integration. Due to the fragmentation of Police forces, there was no plan for the Police to upload unstructured data in the shared digital repository, that is, the Collaborative Digital Platform. An informant, in particular, stressed that:

> This should not be surprising because the end-to-end justice system has never actually been designed. It has grown organically layer by layer over the years (Head of IT, Ministry of Justice).

Figure 4 summarizes these cumulative improvements toward back-end e-Government transformation using Davison's et al. (2005) alignment-based maturity model.
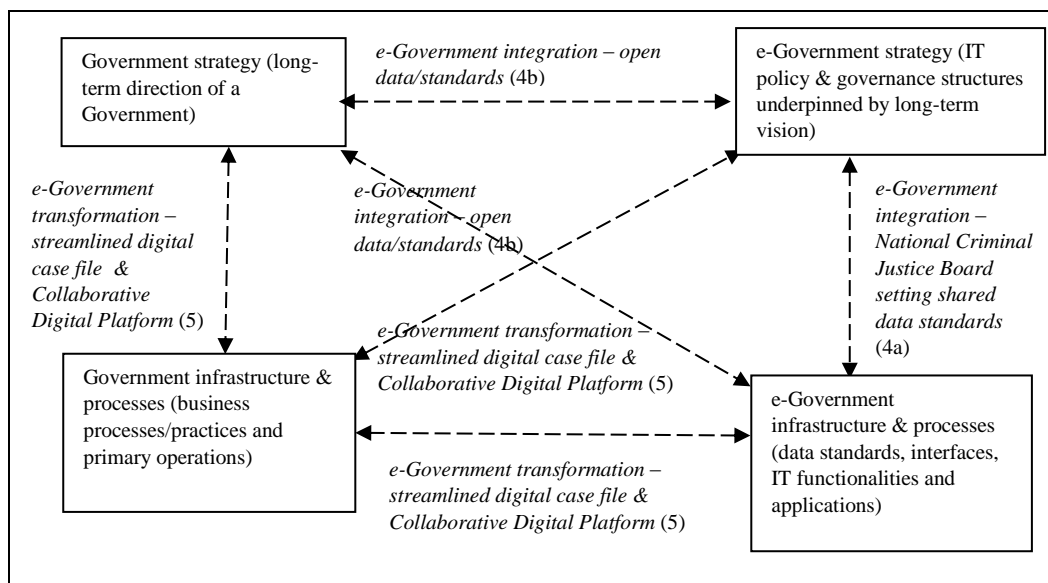
Figure 4. Alignment-based maturity model (Dashed arrows: trajectory 2. Solid arrows -trajectory 1- dropped for the sake of simplicity. Adapted from Davison et al. 2005)

The analysis of the last two Sections can be captured with a more nuanced description of the sequence of events associated with each stage of Davison's et al. (2005) alignment-based maturity model. Table 3 captures the occurrence of these sequential events for each stage of Davison's et al. (2005) model and their associated trajectories.

Occurrence of events over time	Stages of back-end e-Government evolution based on Davison's et al. (2005) model	Trajectories
(1) Government transformation followed by (2) e-Government alignment	Strategic Planning	Trajectory 1 (Joined-Up Government)
(3) E-Government automation (one-way interface) followed by partial deployment of two-way interface	Systems Development	
(4a) Criminal Justice System Efficiency Program setting up National Criminal Justice Board followed by (4b) formulation of open standards principles	Integration	Trajectory 2 (e-Government Transformation)
(5) Streamlined digital case file followed by Collaborative Digital Platform	Transformation	

Table 3. Occurrence of sequential events for each stage of Davison's et al. (2005) model and their associated trajectories

4.3. ANALYSIS OF THE CASE: THE TRAJECTORY-TURNING POINT THEORY IN ACTION

So far we have argued for the need to combine the perspectives of maturity and strategic alignment models to develop explanations that are commensurate with the intricacies and complexities of public sector projects. Though Davison's et al. (2005) alignment-based maturity model is a comprehensive model for capturing change occurring at multiple bureaucratic levels (i.e., strategic and operational levels), it downplays the temporal dimension because it does not account for discontinuous events that may shift transition paths. Accordingly, we need to move beyond Davison's et al. (2005) model to show that change may occur at different rates (or rhythms) within multiple levels. Building on Table 3, we derive a higher-level model or theory, namely, the trajectory-turning point theory which is characterized by the alternation between trajectories and turning points. While change is continuous and incremental within trajectories, it becomes more discontinuous, episodic, and radical between trajectories. Figure 5 shows the trajectory-turning point theory in action.
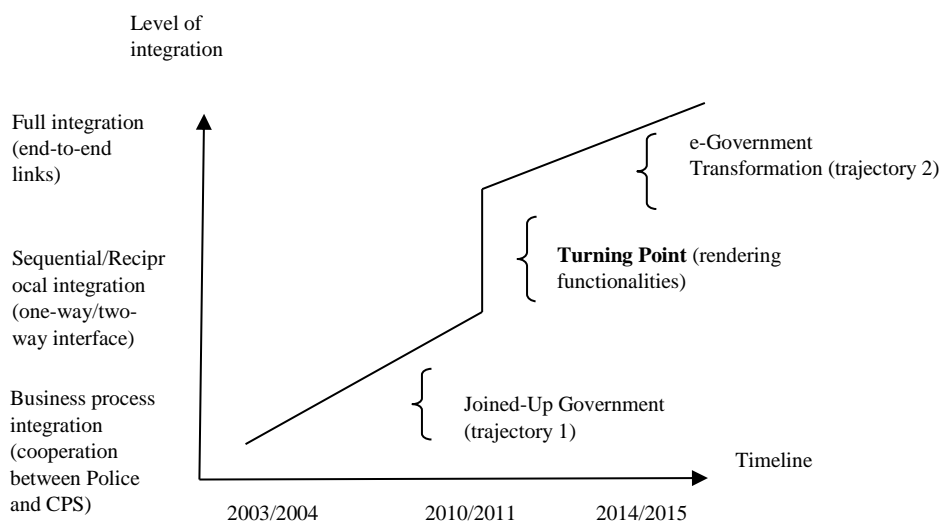
Figure 5: The trajectory-turning point theory in action

It is worth stressing that while gaps or discontinuities may demarcate substantial shifts between stages of predictable e-Government maturity (Klievink & Janssen, 2009), "not all sudden changes are turning points, but only those which are succeeded by a period evincing a new regime" (Abbott, 2001, p. 258). Furthermore, turning points have a "hindsight" character because one can pinpoint them only with the "passage of sufficient time" (Ibid, p. 245). For example, in the case under investigation, rendering functionalities were small add-ons to existing technological functionalities. Nevertheless, they turned out to be momentous for the development of a broader end-to-end e-Government vision.

In addition, the trajectory-turning point theory shows that the transition toward e-Government maturity is an unpredictable process driven by underlying mechanisms or "motors" of change (Van de Ven & Poole, 1995). While extant e-Government literature has focused on stage-wise growth (i.e., life-cycle) and an envisioned end state (i.e., teleology) as key drivers of change (Lasrado et al., 2015; Poeppelbuss et al., 2011), e-Government maturity is a more complex accomplishment where life-cycle and teleological drivers combine with dialectical (i.e., the pros and cons underpinning change initiatives), evolutionary (i.e., the random process of variation and natural selection), and improvisational drivers (i.e., acting in the absence of prior planning) in a dynamic fashion.

Yet, turning points are so abrupt that there is no room for the life-cycle "motor" to get under way within short bursts of radical change. Table 4 outlines the key drivers (or "motors") of change underpinning the trajectory-turning point theory.

	Trajectory 1: Joined-Up Government (sequential and reciprocal integration thanks to one-way/two-way links between Police and CPS)	**Turning Point:** (rendering functionalities spawning a new vision of inter-organizational collaboration *post hoc*)	**Trajectory 2: e-Government Transformation** (end-to-end links with full integration between Police, CPS, and Courts)
Teleological driver (i.e., change toward an envisioned end state)	Joined-up Government as the envisioned end state (e.g., Creating CJIT with the aim of designing the CJSE to promote joined-up working between Police and CPS)	Inter-organizational collaboration as the retrospective justification for the new end state (e.g., Developing rendering functionalities to enable the collaborative mobilization of a wider range of agencies)	Full integration as the envisioned end state (e.g., Launching the Criminal Justice Efficiency Program with the aim of creating a National File Standard based on TCP/IP and XML standards to achieve full integration between Police, CPS, and Courts)
Life-cycle driver (i.e., stage-wise change)	Linear and irreversible sequence of stages (e.g., Strategic Planning leads to Systems Development)	No room for life-cycle "motor" because turning points are too abrupt	Linear and irreversible sequence of stages (e.g., e-Government integration leads to e-Government transformation)
Evolutionary driver (i.e., the random process of variation followed by natural selection and retention)	Random technological changes naturally selected and retained (e.g., natural selection of Two-Way Interface or TWIF)	Random technological changes naturally selected and retained (e.g., natural selection of email technology, PDF standards, and selective retention of case management systems by the Courts)	Random technological changes naturally selected and retained (e.g., natural selection of JSON standards)
Improvisation driver (i.e., acting in the absence of prior planning)	Spontaneous response to unpredictable changes (e.g., experimenting with TWIF)	Spontaneous response to unpredictable changes (e.g., responding to the Courts' unexpected adoption of case management systems by	Spontaneous response to unpredictable changes (e.g., retrofitting JSON standards in the context of the National File Standard, thus streamlining the

		tweaking electronic exchanges with new rendering functionalities)	exchange of written information)
Dialectical driver (i.e., the pros and cons underpinning change initiatives)	Comparing costs vs. benefits as two poles in tension with each other (e.g., cons such as limitations of data size, cultural, and organizational issues outweigh the pros or efficiency savings in the TWIF context)	Comparing costs vs. benefits as two poles in tension with each other (e.g., standardized forms as a way of balancing the tension between the benefit of technological integration and the reality or cost of institutional fragmentation)	Comparing costs vs. benefits as two poles in tension with each other (e.g., JSON is an ideal data-interchange format because it is completely language independent. Nevertheless, it entails costs because it requires exchanging holistic information packages rather than structured data)

Table 4: Key drivers of change underpinning the trajectory turning-point theory

Thus, instead of viewing e-Government maturity as a unitary progression of an irreversible sequence of stages based on a life-cycle driver of change, the trajectory-turning point theory opens up more empirical possibilities because it views the process of e-Government maturity in terms of a broader variety of generative mechanisms underpinning development and change of public sector infrastructures (see arrows in Figure 6 below). More specifically, in the case under investigation, workarounds to existing electronic exchanges emerged in response to the Courts' unexpected adoption of case management systems. Such workarounds, in turn, triggered a teleological "motor" aimed at enabling the collaboration between Police, CPS, and Courts *post hoc*. Hence, the new vision of inter-organizational collaboration emerged retrospectively when the CPS developed a rendering functionality that enabled the production of standardized forms capable of balancing the (dialectical) tension between the benefit of technological integration and the reality of institutional fragmentation. Far from working alone, these three mechanisms (i.e., improvisation, dialectic, and teleology) intermingled to account for the emergence of a new vision of e-Government transformation. Figure 6 shows that e-Government strategizing is the outcome of a complex interplay of generative mechanisms that may either alternate over time or interact between and among each other.
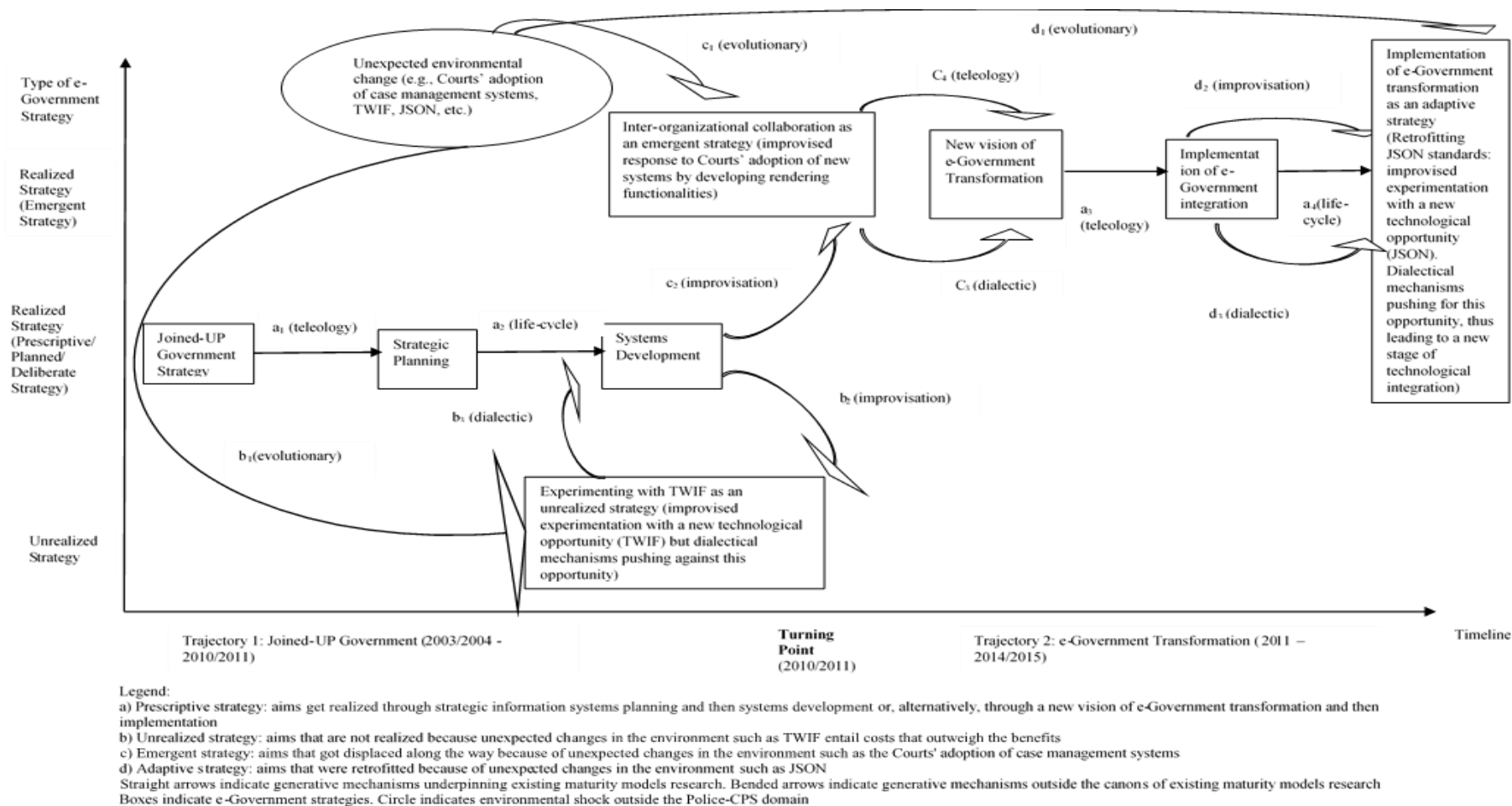
Type of e-Government Strategy

Realized Strategy (Emergent Strategy)

Realized Strategy (Prescriptive/ Planned/ Deliberate Strategy)

Unrealized Strategy

Unexpected environmental change (e.g., Courts' adoption of case management systems, TWIF, JSON, etc.)

c_1 (evolutionary)

d_1 (evolutionary)

C_4 (teleology)

d_2 (improvisation)

Implementation of e-Government transformation as an adaptive strategy (Retrofitting JSON standards: improvised experimentation with a new technological opportunity (JSON). Dialectical mechanisms pushing for this opportunity, thus leading to a new stage of technological integration)

Inter-organizational collaboration as an emergent strategy (improvised response to Courts' adoption of new systems by developing rendering functionalities)

New vision of e-Government Transformation

Implementation of e-Government integration

a_3 (teleology)

a_4 (life-cycle)

c_2 (improvisation)

C_3 (dialectic)

d_3 (dialectic)

Joined-UP Government Strategy

a_1 (teleology)

Strategic Planning

a_2 (life-cycle)

Systems Development

b_1 (dialectic)

b_2 (improvisation)

b_3 (evolutionary)

Experimenting with TWIF as an unrealized strategy (improvised experimentation with a new technological opportunity (TWIF) but dialectical mechanisms pushing against this opportunity)

Trajectory 1: Joined-UP Government (2003/2004 - 2010/2011)

Turning Point (2010/2011)

Trajectory 2: e-Government Transformation (2011 – 2014/2015)

Timeline

Legend:
a) Prescriptive strategy: aims get realized through strategic information systems planning and then systems development or, alternatively, through a new vision of e-Government transformation and then implementation
b) Unrealized strategy: aims that are not realized because unexpected changes in the environment such as TWIF entail costs that outweigh the benefits
c) Emergent strategy: aims that got displaced along the way because of unexpected changes in the environment such as the Courts' adoption of case management systems
d) Adaptive strategy: aims that were retrofitted because of unexpected changes in the environment such as JSON
Straight arrows indicate generative mechanisms underpinning existing maturity models research. Bended arrows indicate generative mechanisms outside the canons of existing maturity models research
Boxes indicate e-Government strategies. Circle indicates environmental shock outside the Police-CPS domain

Figure 6: e-Government strategy and the evolving interplay of generative mechanisms (Adapted from Karpovsky et al., 2014)

We submit that the evolving interplay of generative mechanisms will help scholars move e-Government maturity research beyond a simple description of how transitions occur over time to a more thorough explanation of why they occur the way they do. This, in turn, is an essential pre-requisite for understanding IS strategizing in general and the e-Government strategizing process in particular.

5. DISCUSSION

Spurred by recent calls for future research to "conduct more longitudinal studies to develop process models of e-Government evolution" (Cf. Bélanger & Carter, 2012, p. 379), we have traced in this paper the transition toward back-end digital justice transformation in the English system of criminal justice. In particular, we have asked the following questions: 1) How does this system evolve? 2) Why does its evolution defy, to a certain extent, rationalistic planning? Drawing on Davison's et al. (2005) alignment-based maturity model, we have shown that organizational strategies and technological architectures tend to mirror each other over time through a process of (re)alignment. Furthermore, drawing on the notion that transitions may capture radical shifts other than ordinary stages of nuanced progression along regular trajectories (Abbott, 2001), we have anchored our analysis into a more basic and general theory of process (Langley, 1999; Markus & Robey, 1988; Mohr, 1982; Poole et al., 2016; Van de Ven & Poole, 1995). Viewing e-Government maturity (or stage) models from the perspective of process theory, we have argued that such models tend to downplay the complexity that characterizes the evolution of public-sector infrastructures (Coursey & Norris, 2008; Debri & Bannister, 2015; Sandoval-Almazán, R., & Gil-Garcia, 2018). They tend to portray stages of regular progression unfolding in a top-down fashion at the expense of more unpredictable, bottom-up (re)alignment processes. They also conceive of e-Government strategies as means to pre-defined goals, thus endorsing a prescriptive approach that views e-Government strategy as a rational process of long-term planning. On the contrary, this paper demonstrates that formidable barriers divide jurisdictions within criminal justice. These barriers include institutional and legacy issues (e.g., fragmentation of Police forces), as well as diverse data ownership and retention policies. Coupled with exogenous shocks pushing technological development along uncharted trajectories (e.g., rendering functionalities), these barriers may seriously undermine top-down planning approaches, thus calling for more emergent approaches to e-Government strategy.

Our work contributes to both theory and practice. With regard to theoretical contributions, most e-Government maturity models are anchored into process theories that show progressive, stepwise, and prescriptive phases (Coursey & Norris, 2008; Debri & Bannister, 2015; Sandoval-Almazán, R., & Gil-Garcia, 2018). Rather than portraying a predictable sequential process, we have elevated our analysis into a more abstract description of patterns of events (labelled as trajectories) that are punctuated by radical shifts or turning points (Abbott, 2001). Though, in our study, turning points marked a progressive move toward a new trajectory of wider end-to-end integration, this move was hardly transformational. Not only has the Collaborative Digital Platform proved to be a missed opportunity because of the lack of planning "for the Police to directly upload material to this repository" (HMCPSI-HMIC, 2016, p. 38). The gradual replacement of XML standards with JSON standards has also entailed huge opportunity costs considering that XML has merit for information sharing since it is based on the (bilateral) exchange of structured data rather than holistic information packages. Accordingly, our analysis bypasses the assumptions that underpin e-Government maturity models. Rather than portraying a linear and progressive movement, it does capture the twists and turns associated with e-Government evolution, thus showing that operational and institutional barriers may lead to sub-optimal outcomes (e.g., the Collaborative Digital Platform for unstructured data, the streamlined digital case file for structured data, etc.).

The trajectory-turning point theory, in addition, answers the call for stronger theoretical foundations in e-Government research (Bélanger & Carter, 2012; Heeks & Bailur, 2007; Nograšek & Vintar, 2014) because it shows that chance and unexpected environmental changes play a pivotal role in the evolution of public sector infrastructures so much so that goals must be continuously re-adjusted to take advantage of rapid and unpredictable opportunities (Peppard & Ward, 2004). In particular, getting to grips with the generative mechanisms (or "motors" of change) is an essential step for e-Government strategizing. Not only is e-Government strategizing concerned with the envisioned end state but it is also concerned with the ways to get to the envisioned end state even if the envisioned end state turns out to be a moving target. As this paper demonstrates, even small, unpredictable environmental changes may trigger the improvisation driver (e.g., the Courts' unexpected adoption of case management systems, TWIF, JSON, etc.). We submit that improvisation will play a pivotal role in modern-day strategizing because traditional project-planning and control tools are becoming increasingly unsuitable in a constantly-changing and unpredictable environment.

The practical contribution that emerges from this paper deals with issues of design and planning. Given that public-sector infrastructures are large-scale projects where the social and the technical aspects are deeply entangled, such infrastructures can rarely be designed from scratch (Ciborra, 2000; Lanzara, 2013). Therefore, the scope of design is very narrow when it comes to public-sector infrastructures because the most plausible thing to do is to retrofit new software languages along the way in a piecemeal fashion as standards evolve (e.g., as JSON slowly replaced XML standards). Though it may be tempting to apply a rationalistic planning perspective to e-Government evolution and argue for the development of dynamic capabilities to migrate from one stage to the other (Klievink & Janssen, 2009), the reality is that digitalization is in part the product of tinkering, patching up, and improvisation (Ciborra, 2002; Galliers, 2006; Lanzara, 2013; Yeow et al., 2018). As well as developing dynamic capabilities, IT designers, managers, and policymakers should strive to develop improvisational capabilities to cope with unpredictable environmental change. Improvisational capabilities may lead to small mistakes (e.g., TWIF). Nevertheless, these mistakes are more tolerable and correctable than large, costly mistakes stemming from long-term, rationalistic planning.

While we agree that stage models "can potentially serve as planning instruments for policymakers to stimulate the development of capabilities at the right time" (Klievink & Janssen, 2009, p. 277), we urge designers, managers, and policymakers alike not to take the stage (or maturity) model approach too literally. As Korzybski once said "the map is not the territory" (quoted in Bateson, 2000, p. 455). More specifically, in our case the move from integration to seamlessness or transformation did not fully materialize in spite of the emergence of a broader end-to-end vision of e-Government. Therefore, the transition toward back-end e-Government transformation is not necessarily progressive in its "technical development, nor is it without its problems" (Coursey & Norris, 2008, p. 533). Rather, it is an unpredictable process because of the evolving interplay of a variety of generative mechanisms that may lead to sub-optimal outcomes (Abell, 2004; Markus & Rowe, 2018). Table 5 compares and contrasts our findings with existing e-Government research while stressing that the trajectory-turning point theory calls for a renewed conceptualization of e-Government strategy that is more "dynamic, iterative, interactive and continuous" (Peppard et al., 2014, p. 5).

	Existing e-Government Maturity Models	Trajectory-Turning Point Theory
Description	Maturity models are frequently referred to as stages-of-growth or stage models and usually depict a sequence of stages that together form an anticipated, desired, or logical path from an initial to a target maturity state (Poeppelbuss et al. 2011, p. 506)	This is a theory that captures incremental change within trajectories but radical change between trajectories (i.e., turning points). Turning points play a crucial role in the e-Government strategizing process because they signal discontinuities in the alignment process
Key drivers of change	Life-cycle "motors" with glimpses of teleological drivers (Lasrado et al., 2015; Poeppelbuss et al., 2011)	Life-cycle, teleological, evolutionary, dialectical and improvisation drivers that may either interact with each other or alternate at different times
Planning logic	Prospective logic: Separation of IS plan (formulation) from its implementation (execution). Maturity models (or stage models) "can potentially serve as (rationalistic) planning instruments for policymakers to stimulate the development of (dynamic) capabilities at the right time" (Klievink & Janssen, 2009, p. 277)	Retrospective logic: Tinkering, patching-up, and improvisation. IT designers, managers, and policymakers alike should develop improvisational capabilities (e.g., experimenting, retrofitting, tweaking, etc.) best suited for coping with unpredictable environments (Pavlou & El Sawy, 2010). "If we can't predict the future, we should not pretend that we can" (Galliers, 2006, p. 11)
Conceptualization of e-Government strategy	Strategy as a prescriptive plan: e-Government strategy as a means to achieve a pre-defined goal	Strategy as an emergent process: e-Government strategy as "dynamic, iterative, interactive and continuous" (Peppard et al., 2014, p. 5)

Table 5. Outline of key findings

6. CONCLUSION

E-Government scholars have mostly been concerned with developing stage or maturity models rather than theorizing about them (Heeks & Bailur, 2007; Nograšek & Vintar, 2014). We aim to fill this gap in this paper. More specifically, we strive to develop a theory of e-Government maturity that revolves around the concept of turning point, that is, a radical shift that switches trajectories. This theory, in turn, challenges the theoretical assumptions of existing e-Government maturity models that e-Government infrastructures evolve in a progressive, stepwise, and prescriptive fashion (Coursey & Norris, 2008; Debri & Bannister, 2015; Sandoval-Almazán, R., & Gil-Garcia, 2018). Far from being a

progressive process, e-Government maturity may as well lead to sub-optimal outcomes if it stumbles across historical and/or institutional barriers to change. Though IS scholars have recently theorized e-Government maturity models as process theories that combine the perspectives of life-cycle "motors" and teleology (Lasrado et al., 2015; Poeppelbuss et al., 2011), this paper demonstrates that the assumptions of linear and irreversible change coupled with the idea of control (i.e., goal formulation and smooth implementation) are too unrealistic. The trajectory-turning point theory we develop overcomes these limitations because it accounts for the dialectical tensions that characterize e-Government maturity (e.g., the pros and cons underpinning change initiatives) while being mindful both of evolutionary mechanisms (e.g., the natural selection of email technology, the Courts' selective retention of case management systems, etc.) and improvisation mechanisms (e.g., developing new rendering functionalities in the absence of prior planning). Accordingly, the trajectory-turning point theory provides "stronger and broader explanatory power of organizational change and development processes" (Van de Ven & Poole, 1995, p. 511).

We now outline possible ways this study can be taken forward, as well as its limitations. First, future research could draw on the idea of turning point to break down the regular trajectories in which e-Government maturity evolves. Arguably, public-sector infrastructures evolve in a path-dependent fashion (Aanestad & Jensen, 2011; Hanseth, 2013). Yet, these regular trajectories are far less important than the radical shifts (or turning points) that switch these trajectories (Abbott, 2001). Accordingly, future research could deploy longitudinal case studies in different e-Government settings or countries to replicate our findings and see whether regular trajectories interject with turning points in an unpredictable fashion. Though in the case under investigation the turning point marked a progressive albeit sub-optimal move toward e-Government transformation, other scholars may as well witness turning points signaling a regressive movement characterized by a reversal of change initiatives.

Second, future research could leverage the notion of alignment as "a state or an outcome" (Reich & Benbasat, 2000, p. 82) through a mix of variance and process theories (Chan & Reich, 2007; Eisenhardt, 1997; Langley, 1999). Though rigorous but flexible methods are in short supply (Sabherwal et al., 2001), researchers could investigate the existence of processes and the variations they may take in different contexts by combining process-tracing methods with comparative case studies (George & Bennett, 2005). This methodological strategy could help researchers develop theoretical replications (Yin, 2014) because it could reveal multiple, equifinal processes leading to a final state (e.g., a state of successful short-term or long-term alignment). Accordingly, researchers could pinpoint multiple processes that show how the combination of strategic and technological imperatives leads to successful alignment. These processes, in turn, could serve as building blocks for the development of typological theories, that is, theories of types, mixed-types, and sub-types of successful short-term or long-term alignment.

Clearly, this work is not without its limitations. Four issues are worth highlighting. First, our findings do not support statistical generalizations (Yin, 2014). Rather, they support analytical generalizations where turning points play a crucial role in re-directing the trajectories unfolding over long periods of time. Second, we have focused on standardization issues between and among criminal justice system organizations rather than interactions with citizens. Not only does this run counter to some e-Government maturity models (e.g., Andersen & Henriksen, 2006, p. 246). It is also possible that internal (e.g., Government-to-Government) and external (e.g., Government-to-Citizen) perspectives may be connected along a single path or disconnected across separate paths evolving at different rates (Heeks, 2015). Third, we have focused on the drivers, inhibitors, and enablers of alignment rather than the actual activities of aligning, thus gaining only limited knowledge of the rich tapestry of activities by which organizational actors make alignment happen in practice (Karpovsky & Galliers, 2015). Fourth, and last, though we have triangulated our data sources, our reliance on interviews as the most important data

collection method is liable to response bias, poor recall, and inaccurate articulation of past events (Yin, 2014). Notwithstanding these limitations, this paper is a genuine attempt to reappraise the transition toward full back-end digital justice integration in the English setting. "Very few studies use longitudinal methods, and there is little development in this area" of e-Government research (Cf. Madsen et al., 2014, p. 27; Solli-Sæther, & Gottschalk, 2010, p. 280). Not only can longitudinal studies help e-Government researchers shed a new light on the dynamics characterizing the evolving interplay between and among generative mechanisms. They can also provide strong theoretical foundations for the study of e-Government.

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APPENDIX A: AN OVERVIEW OF e-GOVERNMENT MATURITY MODELS

Author(s)	Number of stages & labels
Andersen & Henriksen (2006)	4 stages: (1) Cultivation, (2) Extension, (3) Maturity and (4) Revolution
Baum & Di Maio (2000)	4 stages: (1) Web Presence; (2) Interaction; (3) Transaction and (4) Transformation
Davison et al. (2005)	5 stages (1) Rhetorical Intention, (2) Strategic Planning, (3) Systems Development, (4) Integration and (5) Transformation
Deloitte Research (2000)	6 dynamic stages: (1) Information Publishing/Dissemination, (2) Official, Two-Way Transactions, (3) Multi-Purpose Portals, (4) Portal Personalization, (5) Clustering of Common Services, (6) Full Integration and Enterprise Transformation
Fath-Allah et al. (2014)	4 stages: (1) Presence, (2) Interaction, (3) Transaction and (4) Integration
Gottschalk (2009)	5 stages: (1) Computer Interoperability, (2) Process Interoperability, (3) Knowledge Interoperability, (4) Value Interoperability and (5) Goal Interoperability
Guijarro (2007)	2 stages: (1) Enabling Interoperability and (2) Aligning Administrative Procedures with Technical Systems
Janowski (2015)	4 stages: (1) Digitalization, (2) Transformation, (3) Engagement and (4) Contextualization
Janssen & Veenstra (2005)	5 stages: (1) No Integration, (2) One-to-One Messaging, (3) Warehouse, (4) Broker and (5) Orchestrated Broker Architecture
Layne & Lee (2001)	4 stages: (1) Catalogue, (2) Transaction, (3) Vertical Integration and (4) Horizontal Integration
Lee (2010)	5 stages: (1) Presenting, (2) Assimilating, (3) Reforming, (4) Morphing and (5) e-Governance
Moon (2002)	5 stages: (1) Simple Information Dissemination, (2) Two-Way Communication, (3) Service and Financial Transactions, (4) Integration and (5) Political Participation
Netchaeva, (2002)	5 stages: (1) Formation of Departmental and Ministerial Online Sites, (2) Interactive Sites, (3) Forums and Opinion Polls, (4) Online Services, (5) Unified Government Portal
Siau & Long (2005)	5 stages: (1) Web Presence, (2) Interaction, (3) Transaction, (4) Transformation, and (5) e-Democracy
Valdés et al. (2011)	5 organizational maturity levels: (1) Initial, (2) Developing, (3) Defined, (4) Managed and (5) Optimizing
West (2004)	4 stages: (1) Billboard stage, (2) Partial-Service-Delivery Stage, (3) Portal Stage and (4) Interactive Democracy Stage

APPENDIX B: SUMMARY OF DATA COLLECTION METHODS

Sources	Details
Desk research	24 documents including reports and legal documents
Number of interviewees (average duration of interviews 60 minutes)	*17 interviewees* CPS: 1 Borough Prosecutor (07/03/2006), 1 Administrator (10/10/2006), 2 Duty Prosecutors (10/10/2006), 1 Director of Digital Business Program (06/21/2016) Police: 1 Head of Business Change (12/14/2006), 1 Head of Police ICT Company (06/21/2016), 1 Detective Constable (10/24/2006) Criminal Justice Information Technology Organization: 1 Benefits Manager (12/08/2006), 1 Business Architect (12/14/2006), 1 Business Consultant (05/24/2006), 1 Crown Prosecutor (05/24/2006) Criminal Justice System Efficiency Program: 1 Business Consultant (01/13/2012), 1 Crown Prosecutor (01/13/2012), 1 Program Manager (01/13/2012), 1 Senior Project Manager (04/15/2014), 1 Adjunct Director of Criminal Justice System Business Strategy (04/16/2014)
Number of focus groups (average duration of 150 minutes)	*6 mini focus groups* 1) Detective Inspector, Case Worker Manager, National Strategy for Police Information Systems (NSPIS) Administrator and Head of Information Systems (Focus Group, Scunthorpe, UK, 01/22/2007) 2) District Crown Prosecutor, CPS Performance Manager, Detective Inspectors (Focus Group, Scunthorpe, UK, 01/22/2007) 3) Criminal Justice Information Technology Organization Team Members, Business Consultants (Focus Group, London, UK, 03/26/2007) 4) Assistant Chief Constable, Chief Superintendent, Business Consultants (Focus Group, Birmingham, UK, 02/28/2011) 5) Program Manager (Criminal Justice System Efficiency Program), Head of Crime (Her Majesty Courts & Tribunal Service), Deputy Chief Constable (National Police Chiefs Council & Criminal Justice System Efficiency Program Board Member), Business Consultant (Focus Group, London, 12/16/2011) 6) Chief Information Officer (CPS), Head of IT (Ministry of Justice), Business Consultant (Focus Group, London, 6/18/2013)
Number of observations (average duration 240 minutes)	*6 observations* 2 observations in the Courts (1 observation on 04/14/2014 and 1 observation on 04/17/2014) 2 observations in the CPS headquarters (1 observation on 05/24/2006 and 1 observation on 01/13/2012) 2 observations in the Police (1 Police Station observed on 10/24/2006 and 1 observation in the Police Information Technology Organization on 11/17/2006)