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An Exploration of Blockchain’s Transformative Potential for Case Management in Kenya

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VALUES AND TECHNOLOGY IN JUSTICE:

An Exploration of Blockchain's Transformative Potential for Case Management in Kenya

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ACKNOWLEDGEMENTS

To my family, academic supervisors, research respondents and supporters – the "village" that made this happen, I remain eternally grateful. May God bless you all.

ABSTRACT

This research is motivated by the systemic failures experienced in Kenya's justice sector, which historically stem from the absence, or poor enforcement of institutional values, and from entrusting largely opaque centralized entities to serve unchecked, as the custodians of all the levers of justice. As a result, inefficiency and corruption became entrenched, and reliable data which serves as a useful indicator of the performance of the sector's individual entities, and as a whole, is either skewed or absent. The outcome of such inefficiency and corruption is experienced by the everyday court user, and in particular justice seekers, as a failure in the delivery of justice.

The thesis examines how the values enshrined in Kenya's ground-breaking 2010 Constitution and virtually all justice sector strategies and blueprints, can intersect with technology to mitigate against some of the operational and ethical gaps described above. It will be seen that the 2010 Constitution has been pivotal in ushering-in the reforms necessary to transform Kenya into an equitable society founded on open and accessible institutions.

The thesis proposes that technology such as blockchain-based case management systems can be imbued with values in the design process, to enhance transparency, accountability, stakeholder participation, coordination and efficiency in the administration of justice. It is however acknowledged that for this objective to be met, it is equally imperative for parallel efforts to be made in ensuring the integrity of offline or off-chain processes and procedures. These include the provision of an enabling regulatory framework, as well as base infrastructural amenities such as connectivity, human resource capacity and other essential resources.

This thesis therefore interrogates the claim that blockchain, can be viewed as a new institutional technology of governance that competes with traditional institutions such as, the firm, markets or government. Therefore, the role of blockchain in mitigating justice sector "*transaction costs",* or, the non-pecuniary costs of accessing, obtaining and enforcing justice is examined. The thesis does not argue that governments, or justice sector institutions, should be replaced by technology in their governance role. It however does argue that some of the coordination or enforcement roles vested in the State may be transferred to computational functions spread across a permissioned blockchain, for better and more efficient justice outcomes for court users.

The examination of blockchain is inspired by the express goal of criminal justice actors within the sector to "*harness technology as an enabler of justice*". Blockchain is therefore examined as a viable "trustless, or trust-by-computation" solution for "opening" Kenya's justice sector, grounded on a framework of constitutional values. This inquiry is undertaken through the lens of New Institutional Economics, which is the dominant theory on governance and institutions, in economics.

The thesis however refrains from presenting any technology, least of all cutting-edge or emerging technology such as blockchain, as a *panacea* to all problems in any industry, or as a substitute for the State, as indeed some see blockchain. However, the potential for values-oriented technology to accelerate institutional, sectoral and therefore societal change in Kenya, is rigorously explored.

List of Tables, Illustrations and Diagrams

List of Abbreviations and Short Forms

2010 Constitution	Constitution of Kenya, 2010
ADR	Alternative Dispute Resolution
AI	Artificial Intelligence
AJS	Alternative Justice System(s)
API	Application Programming Interface
BPM	Business Process Management
ECMS	(Electronic/Automated) Case Management System
CPIMS	Child Protection Information Management System
CUC(s)	Court Users' Committee(s)
CI	Confidence Interval
Dapp	Decentralized Application
DAO	Decentralized Autonomous Organisation
DCS	Department of Children's Services
DLTs	Distributed Ledger Technologies
EACC	Ethics and Anti-Corruption Commission
GTFS	General Transit Feed Specification
GTZ	German Technical Cooperation
IECMS	Integrated Electronic Case Management System
ICO	Initial Coin Offering
ICT	Information and Communications Technology
IPFS	InterPlanetary File System
IQR	Interquartile Range
JFMIS	Judiciary Financial Management Integrated System
JJIMS	Juvenile Justice Integrated Management System
JRLOS	Justice, Reconciliation Law and Order Sector
JSC	Judicial Service Commission
JSCS	Judicial Smart Contract Service
JTF	Judiciary Transformation Framework
KNCHR	Kenya National Commission on Human Rights
KPS	Kenya Prisons Service
KRA	Key Result Area
KShs	Kenya Shillings
KSI	Keyless Signature Infrastructure
LAO	Limited Access Order
Multisig	Multi-Signature (Protocol)
NCAJ	National Council on the Administration of Justice
NCSC	National Centre for State Courts
NIE	New Institutional Economics
NIEM	National Information Exchange Model
NODS	National Open Court Data Standards
NPM	New Public Management
NPS	National Police Service
OAO	Open Access Order
ODPP	Office of the Director of Public Prosecutions
OECD	Organization for Economic Cooperation and Development
OGP	Open Government Partnership
ORMS	Offender Records Management System
P2P	Peer-to-Peer
PACS	Probation and Aftercare Service
PEV	Post-Election Violence
PLEAD	Programme for Legal Empowerment and Aid Delivery in Kenya

SJT	Sustaining Judiciary Transformation
SLA	Special Leave to Appeal
SMS	Short Messaging Service
SOJAR	State of the Judiciary and the Administration of Justice (Annual) Report
SPSS	Statistical Package for Social Sciences
SSI	Self-Sovereign Identity
STAJ	Social Transformation through Access to Justice
UK	United Kingdom
UNICEF	United Nations Children's Fund
UNODC	United Nations Office on Drugs and Crime
USA	United States of America
VSD	Value Sensitive Design
WPA	Witness Protection Agency

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1.0 INTRODUCTION

This thesis is a study of the regulative properties of technology in the present context of the fourth industrial (digital) revolution or Industry 4.0[1] (Cordella and Cortini 2020, p. 4; Sifah *et al.* 2020, p. 1). It interrogates the role that technology, and in particular "blockchain technology" can play in transforming the public sector, and specifically the justice sector in Kenya (Cordella and Cortini 2020, p. 4; Davidson *et al.* 2016, pp. 2, 24). The thesis achieves this by first establishing the need for technology-based institutional transformation in Kenya's justice sector. It does this through a survey and the interview of criminal justice actors and other experts, as well as secondary research on the governance and operational gaps in the sector.

1.1 Overview of the Justice Sector post the 2010 Constitution of Kenya

The question which then follows is – what is Kenya's justice sector, in particular, what is its structure, individual components and the dynamics which make it a critical area for research with respect to institutional reform.

Kenya's legal system is based on statutory law, English common law and customary law (NCAJ 2016, p. 35). Broadly speaking therefore, one may think of Kenya's criminal justice system as being made up of two key components. The first is the formal justice system composed of the Judiciary/courts, Police, Prosecution and other institutional players involved in criminal litigation or, on the other hand informal, traditional or alternative justice mechanisms such as; the resolution of disputes by community elders, mediation, conciliation collectively referred to as the Alternative Justice System (AJS) and Alternative Dispute Resolution (ADR) (UNODC 2018, pp. 14-15, 24-25). Both the formal and informal systems, and their constituent elements are recognized in the 2010 Constitution of Kenya[2] and other governing laws from which they derive their legitimacy. The Constitution also allows for their limited interaction through Court-Annexed AJS among other formalized mechanisms.[3] The focus of this thesis however is the formal justice system, that is, in the criminal rather than the civil justice context, and its component institutions.

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[1] See the World Economic Forum website for more on the first-fourth industrial revolutions; Swab, K., 2016.The Fourth Industrial Revolution: What it Means, How to Respond. Available at: https://www.weforum.org/agenda/2016/01/the-fourth-industrial-revolution-what-it-means-and-how-to-respond/ [Accessed 23 December 2020]

[2] Constitution of Kenya (2010), Available at: http://kenyalaw.org/kl/index.php?id=398 [Accessed 28 April 2022]

[3] See Article 159(2) of the Constitution, Supra. and the AJS Framework Policy here: https://ajskenya.or.ke/download/alternative-justice-systems-framework-policy/ [Accessed on 23 November 2020]

Articles 10 and 232 of the 2010 Constitution prescribe national values and principles which should be adhered to by the State, in the governance of national affairs. These values broadly consist of transparency, accountability, democracy and social justice, and will be important in framing the discussion on institutional and technological reforms in the justice sector.

1.1.1 The Formal Criminal Justice System in Kenya

The present-day formal justice system in Kenya has been in a constant state of evolution since Kenya gained its independence from Britain in 1963 (NCAJ 2016, p. 35). Many of these reforms have focused on ensuring the independence of the Judiciary which is one of the three arms of government, along-side the Executive and Legislature (NCAJ 2016, p. 35; Gainer 2015). The discussion in Chapter Two will illuminate on some of the challenges that have been encountered in establishing the distinction or separation of the Judiciary from the Executive arm of government.

Beyond the Judiciary or court system, the formal justice system is composed of many other bodies or agencies which all play a key role in ensuring that justice is administered in a fair and expeditious manner. A critical development in the evolution of Kenya's justice system post the 2010 Constitutional reforms, was the creation of the National Council on the Administration of Justice (NCAJ). The NCAJ is an overarching entity that not only coordinates the justice sector, but also has oversight over policy making and implementation across the justice sector (UNODC 2018, pp. 11, 36-37). The NCAJ therefore was created in 2011 to cure the silo approach towards the administration of justice in Kenya, and to harness cohesion and efficiency within a disjointed and ineffective criminal justice system.[4]

The NCAJ brings together the state actors listed in *Table 1* below, and non-state actors such as NGOs / independent bodies and private entities to facilitate national consensus and ownership of the criminal justice reform process. They do so while ensuring a coordinated, effective, and consultative approach to the administration of justice.[5] This consultative and coordinated approach was designed to be replicated from the grassroot or operational levels at the counties through Court Users' Committees (CUCs),[6] all the way to the National Council (policy-making) level. Policies drawn from these coordinated efforts are then implemented by the constituent membership of the NCAJ.[7]

[4] See NCAJ website here: https://www ncaj.go ke/about/council-members/ [Accessed 28 April 2022]
[5] Supra.
[6] See CUC information here: https://www.ncaj.go ke/committees/cucs/ [Accessed 30 April 2022]
[7] Supra.

Table 1 below summarizes the criminal justice system players that shall be core to the analysis in this thesis, and their principal mandates. The discussions in Chapter Five which is the data analysis chapter, and Chapter Six on the role of technology in institutional transformation, shall focus on these agencies in examining how the justice sector can be transformed to bring about better justice outcomes for those seeking justice.

Table 1: Table of Criminal Actors and their Principal Mandates and Enabling Laws

No.	Institution	Acronym / Short form	Key Mandate
1.	National Police Service	NPS	Investigation of criminal offences through the Directorate of Criminal Investigations (DCI) and arrest of persons suspected of having committed offences.[8]
2.	Ethics and Anti-Corruption Commission	EACC	Combat and prevent corruption including investigation of corruption and other economic crime.[9]
3.	Office of the Director of Public Prosecutions	ODPP	Takes the Decision to Charge, guides investigations and prosecutes or undertakes criminal proceedings against persons charged with a crime.[10]
4.	Judiciary of Kenya	Judiciary	Adjudication of criminal cases and sentencing of offenders.[11]
5.	Department of Children's Services	DCS	Its mandate includes safeguarding and protecting the rights and welfare of children in need of care and protection.[12]
6.	Probation and Aftercare Service	PACS	Its mandate includes conducting social inquiries on accused persons, supervising bail and non-custodial sentences, rehabilitating and reintegrating child and other offenders into the community.[13]
7.	Office of the Attorney General and the Department of Justice	OAG	Among other mandates the provision of legal aid to indigent litigants through the National Legal Aid Service (NLAS).[14]

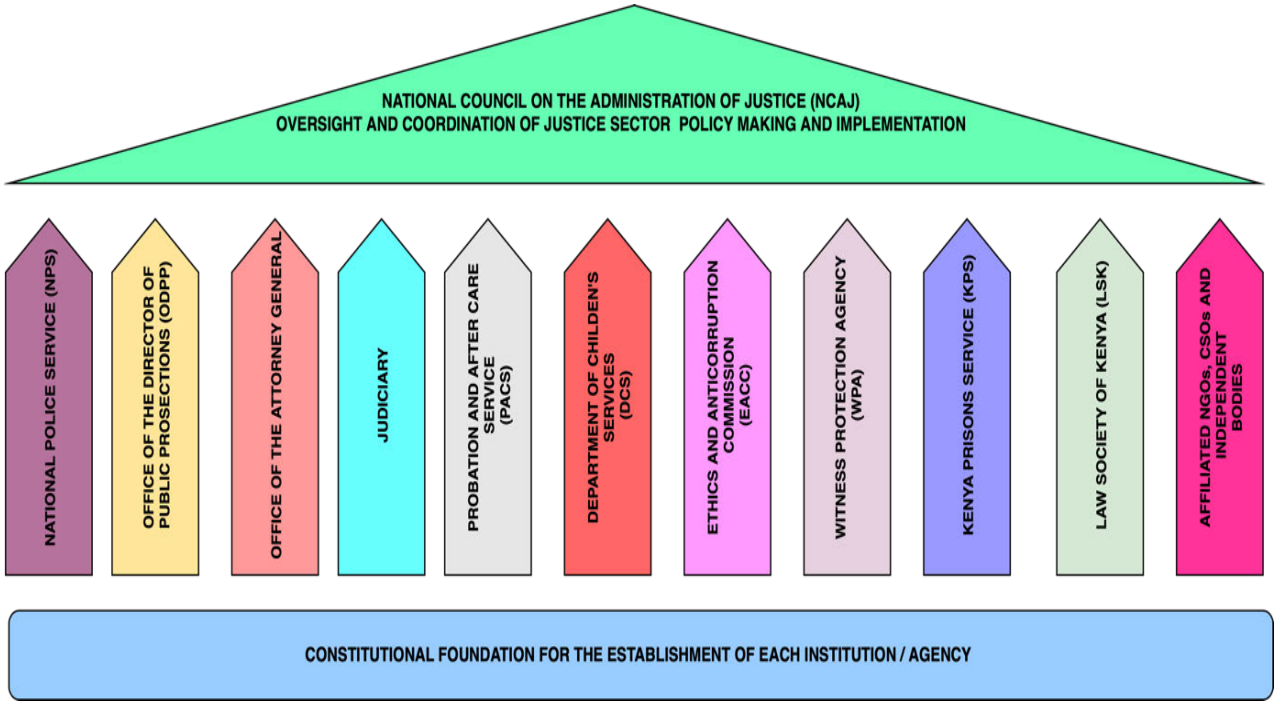
[8] See NPS mandates here: https://www.nationalpolice.go.ke/2015-09-21-17-23-32/dci.html [Accessed 28 April 2022]; See also Arts. 243-247 of the Constitution of Kenya, Supra.
[9] See EACC mandate here: https://eacc.go.ke/default/ [Accessed 28 April 2022]; See also Art. 79 of the Constitution of Kenya Supra., and the Ethics and Anti-Corruption Act No. 22 of 2011, Available at: https://eacc.go ke/default/wp-content/uploads/2018/06/eacc.pdf [Accessed 7 May 2022]
[10] See ODPP mandate here: https://www.odpp.go.ke/mandate/ [Accessed 28 April 2022]; See also Article 157 of the 2010 Constitution, Supra.
[11] See Judiciary mandate here: https://www.judiciary.go ke/about-us/mandate/ [Accessed 28 April 2022]; See also Article 159 of the 2010 Constitution, Supra.
[12] See DCS mandate here: https://www.socialprotection.go ke/children-services/ [Accessed 28 April 2022]; See also the Children Act Cap 141, Available at: http://kenyalaw.org/kl/fileadmin/pdfdownloads/Acts/ChildrenAct_No8of2001.pdf [Accessed 7 May 2022]
[13] See PACS mandate here: https://www.probation.go ke/about-us/mandate html [Accessed 28 April 2022]; See also Probation of Offenders Act Cap 64, Available at: http://kenyalaw.org:8181/exist/kenyalex/actview.xql [Accessed 7 May 2022]
[14] See NLAS mandate here: https://statelaw.go.ke/departments/national-legal-aid-service/ [Accessed 28 April 2022]. See also Art. 156 of the Constitution of Kenya, Supra.

8.	Law Society of Kenya	LSK	The bar association of Kenya with a membership of lawyers and legal practitioners, including defense counsel in criminal cases.[15]
9.	Kenya Prisons Service	KPS	Its mandate includes the containment of convicted persons in safe custody.[16]
10.	National Council on the Administration of Justice	NCAJ	Oversight and coordination of policy making and implementation in the justice sector.[17]

1.1.2 Inter-Agency Collaboration in the Justice Sector

The criminal justice system is therefore composed of the forgoing independent agencies or institutions among others under the umbrella of the NCAJ. These agencies serve as pillars that hold up the rule of law and administration of justice, on the foundation of the Constitution, and other enabling laws. This description of the justice system is visually illustrated in ***Diagram 2*** below:

Diagram 2: Overview of the Criminal Justice System



Source: Author

[15] See LSK mandate here: https://lsk.or.ke/ [Accessed 28 April 2022]; See also the Law Society of Kenya Act Cap 18, Available at: http://kenyalaw.org/kl/fileadmin/pdfdownloads/Acts/LawSocietyofKenyaActCap18.pdf [Accessed 7 May 2022]

[16] See KPS mandate here: https://www.prisons.go ke/CoreFunctions [Accessed 28 April 2022]; See also the Prisons Act Cap 90, Available at: http://kenyalaw.org:8181/exist/kenyalex/actview.xql?actid=CAP.%2090 [Accessed 7 May 2022]

[17] See NCAJ mandate here: https://www ncaj.go.ke/about/council-members/ [Accessed 28 April 2022]; See also Sections 34-37 of the Judicial Service Act No. 1 of 2011, Available at: http://kenyalaw.org/kl/fileadmin/pdfdownloads/Acts/Judicial_Service_Act_2011.pdf [Accessed 7 May 2022]

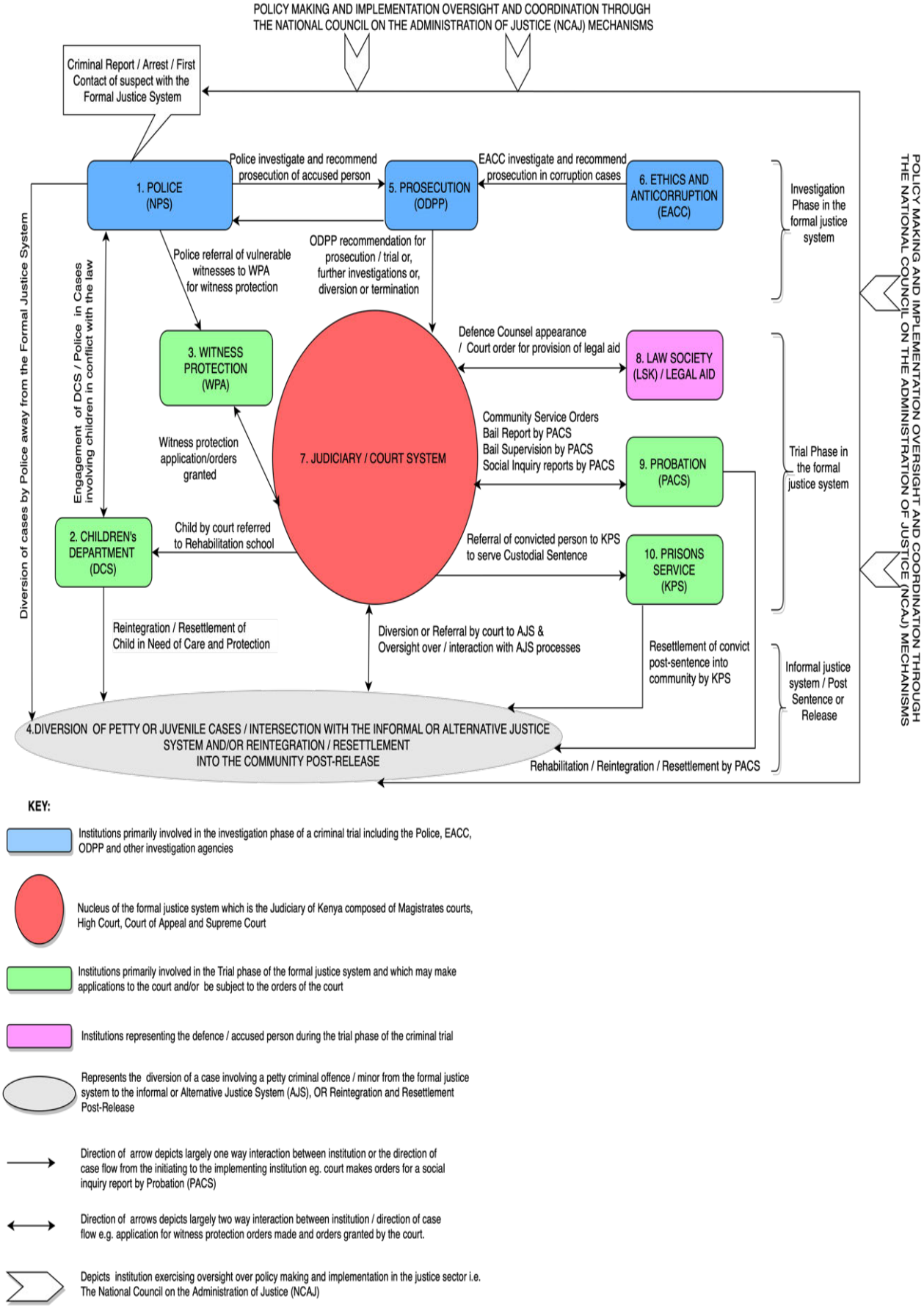
It is however equally important to view the justice system as a network of collaborating and interlinked institutions that work together towards the goal of delivering justice for justice seekers. The justice sector has faced unique challenges and inefficiencies resulting from ineffective interagency collaboration and oversight even after the establishment of the NCAJ. A key focus of post-2010 Constitutional reforms and development assistance has been on harnessing such collaboration that would be necessary for the effective administration of justice, particularly through strengthening the NCAJ as a coordination mechanism (UNODC 2018, pp. 11, 36-37).

Diagram 3 below highlights the interagency collaborations that exist during the investigation (blue actors), trial, post-conviction and sentence (green and pink actors) phases of a criminal case. The diagram also illustrates the case flow in a typical case (e.g. involving children in conflict with the law), with the arrows depicting the different interactions between the actors starting from the point of arrest. The direction of the arrows indicates the role of each actor in either originating or implementing a step, procedure or decision in the justice chain e.g. the Witness Protection Agency (WPA) may make an application to the court for protection orders on behalf of a vulnerable witness which the court may grant. Also, some agencies such as the Prosecution have key roles both in the investigation and trial phases of a criminal case, i.e. in guiding investigations, taking the Decision to Charge and in prosecuting the case against an accused person during the trial. At the heart of the trial is the Judiciary (red circle) which has unique role of managing the trial process.[18]

The grey oblong at the bottom of the diagram represents either the diversion of petty or child offenders from the formal justice system/court trial by the police or by the court. Diversion is governed by law and policy and has been implemented as a measure towards the protection of children, reduction of case backlogs and the decongestion of prisons.[19] This area also represents the intersection of the formal justice system with the informal justice system either as a result of diversion of cases by the police, prosecution or the courts. It is at this stage that Non-Governmental and Civil Society Organisations (NGOs and CSOs) that specialize in providing rehabilitation and reintegration support to offenders also collaborate with the justice system.

[18] See the Active Case Management (ACM) Guidelines on the role of the court in managing the cases and the courtroom: https://www.judiciary.go ke/download/guidelines-for-active-case-management-of-criminal-cases-in-magistrate-courts-and-high-courts/ [Accessed 1 May 2021]
[19] See Diversion Policy here: https://www.odpp.go ke/wp-content/uploads/2022/04/DIVERSION-POLICY.pdf [Accessed 5 May 2022]

Diagram 3: Case Flow and Institutional Interactions in a Typical Criminal Case



Source: Author

The discussion in Chapter Six shall focus on the automation of the interagency interactions illustrated in ***Diagram 3*** through the application of Integrated Electronic Case Management Systems (IECMS). IECMS is technology deployed to coordinate and facilitate the efficient flow of the trial processes, procedures and even resources, from the point a criminal complaint is made, to the conclusion of a case. The analysis in Chapter Six shall therefore focus on the role that technology, and in particular blockchain technology can play in facilitating these interactions between justice actors to enhance access to justice and administrative efficiency.

The discussion in Chapter Six shall also be framed by an examination of the values that blockchain encapsulates and advances in the administration of justice, within the wider context of the national values and principles of governance outlined in Articles 10 and 232 of the 2010 Constitution of Kenya.

1.2 Justification for the Research

As mentioned in forgoing sections, lack of integrity and inefficiency within Kenya's justice sector are experienced by the court user in a variety of ways, including; corruption, missing case files, case back logs, prison overcrowding, lack of interagency coordination etc.[20] Corruption in particular, has been a major challenge for the justice sector Kenya, and efforts towards combatting judicial corruption, have been the preoccupation of a succession of governments since the late 1990s.

1.2.1 A Difficult History with Justice Sector Corruption and Inefficiency

The *Kwach Judicial Reform Committee* headed by retired Court of Appeal Judge Richard Kwach was established in 1998 to investigate judicial conduct, and found judicial corruption to be a systemic practice entailing both grand and petty corruption (ICJ 2005, p. 15). The Kwach report found that corrupt practices typically involved;

[20] The SOJAR report (2018/19) indicates that in 2019, 330 missing case file complaints were filed with the Office of the Judiciary Ombudsman. This number had risen from 281 in 2015/16, 122 in 2016/17 and 182 in 2017/18. In 2018/19 the Office received 385 complaints related to poor service – up from 79 in 2016/17 and 243 in 2017/18. However due to the sustained reforms related to the reduction of case backlogs, in 2018/19 of the complaints regarding delayed ruling and judgements were down to 63, from 94 in 2015/16. Available at: https://ncaj.go ke/wp-content/uploads/2020/01/SOJAR-REPORT-2018- -2019.pdf [Accessed 23 April 2021]. The fiscal years 2019/20 and 2020/21 saw a decline of complaints on missing case files from 230 and 203 respectively however, the number of overall complaints received increased from a total of 1567 to 1829 respectively https://www.judiciary.go ke/download/state-of-the-judiciary-and-administration-of-justice-annual-report-2020-21-sojar/ [Accessed 22 July 2022].

> *"…inducing court officials to lose or misplace files, delay trials, judgements and rulings …payment of money to judges and magistrates to influence their decisions"* (ICJ 2005, p. 15).

In the same year, an independent survey linked corruption in the justice sector to challenges in accessing justice in Kenya (Mwithi 2017, p. 13). A report of the *Advisory Panel of Eminent Commonwealth Judicial Experts* in 2002 found allegations of widespread bribing of Judges (ICJ 2005, p. 15). Later in 2003, the *Integrity and Anti-Corruption Committee* headed by the Justice Aaron Ringera was established to investigate judicial corruption and identify corrupt actors in the Judiciary (ICJ 2005, p. 15). The Committee found that 56% of Court of Appeal Judges, 50% of High Court Judges and 32% of magistrates were implicated in corrupt behaviour (ICJ 2005, p. 15).

However, corruption and maladministration are not the preserve of the Judiciary, and have also been found to be endemic in other institutions within the justice sector in Kenya. The 2013 Report of the Office of the Ombudsman[21] found that the National Police Service (NPS) had the highest number of complaints lodged against across the public service, with a share of 12.82% of the total number of complaints (Office of the Ombudsman 2013, p. 15). The Judiciary was in the fifth place representing 7.43% of the complaints, the state law office was seventh with 3.24% of the complaints, and the Office of the Director of Public Prosecutions (ODPP) was fourteenth with a share of 1.40% of the complaints (Office of the Ombudsman 2013, p. 15).

This negative perception has naturally impacted on public confidence in the ability of these justice sector institutions to fight societal corruption or deliver justice. A 2018 survey conducted by the Ethics and the Anti-Corruption Commission (EACC) found public confidence in the Judiciary stood at only 32 %, while that in the ODPP stood at 41%, (EACC 2019, p. 38). Curiously, disparities in public confidence were also noted even within organisations. In this regard, while the National Police Service (NPS) had the lowest score (19.4%), public confidence in its Directorate of Criminal Investigations (DCI) was much higher and stood at 38.4% (EACC 2019, p. 38).

So challenging was justice sector corruption in the years preceding and immediately ensuing the promulgation of the 2010 Constitution of Kenya, that the then Chief Justice, Hon. Willy Mutunga lamented about judicial corruption as follows:

[21] The Office of the Ombudsman, also known as, the Commission on Administrative Justice was established in 2011 under Article 59(4) of the 2010 Constitution, to among other things, investigate any conduct with respect to public administration and complaints of abuse of power, unfair treatment, manifest injustice or unlawful, oppressive, unfair or unresponsive official conduct.

> *"We found an institution so frail in its structures; so thin on resources; so low on its confidence; so deficient in integrity; so weak in its public support that to have expected it to deliver justice was to be wildly optimistic. We found a judiciary that was designed to fail."* (Gainer 2015, p. 1; Mwithi 2017, p. 10)[22]

In 2005 the International Commission of Jurists (ICJ) partly attributed the failure of anti-corruption measures to the lack of "clear and transparent legal processes" including public complaints mechanisms, to address judicial corruption while retaining judicial independence (ICJ 2005, p. 22). This thesis also argues that corruption has been further entrenched as, centrally maintained data on the status of justice, and the performance of justice sector actors, either cannot be trusted, has been compromised, or is non-existent. As earlier noted, Chapters Five and Six examine how some of these sectoral challenges have, and can be further mitigated.

1.2.2 Harnessing Technology as an Enabler of Justice

Cordella and Contini note that it is now widely accepted that the reach of technology goes beyond simply increasing organisational productivity or providing neutral support to the execution of organisational function (Cordella and Cortini 2020, p. 4). They note that Information and Communication Technology (ICT) frames the causal connection between organizational practices, events, processes, and procedures, by imposing the regulatory frameworks that structure, regulate, and standardize organisational action (Cordella and Cortini 2020, p. 4). They state that these regulatory frameworks are shaped into the technical functionalities of the technology in question as workflows or logical sequences of actions (Cordella and Cortini 2020, p. 4). This description is certainly true for automated or electronic case management systems which are the focus of this thesis.

In this vein, an even bolder claim is that blockchain is a *"revolutionary new institutional technology of governance"* which competes with firms, markets, and economies in economic coordination (Davidson *et al.* 2016, pp. 1-3). Blockchain technology is a form of distributed ledger or database that can be shared and replicated across a network of participating actors (Davidson *et al.* 2016, p. 4). As will be seen in latter discussions, this network may be public or private, and may or may not be tokenized with cryptocurrencies (De Caria 2020, p. 20). In more specific terms blockchain has been defined as:

[22] Reproduced from: Willy Mutunga, *"Progress Report on the Transformation of the Judiciary: The First 120 Days,"* speech given in Nairobi, Kenya, 19 October 2011.

> *"A mathematically (or cryptographically) secured, chronological, and decentralized consensus ledger, or database, whether maintained by internet interaction, peer-to-peer network, or otherwise."* (Davidson *et al.* 2016, pp. 4, 6).

Blockchain is therefore customarily used to arrive at a consensus on the data, records or "facts" relevant to economic or other coordination, and this is where its distinct and novel contribution to governance processes lies (Davidson *et al.* 2016, p. 3). Historically, ledgers or databases maintained by a central authority such as records or registries on property ownership, identity of persons, or banking records, have been the key means by which participants in an economy have arrived at a consensus on the status of a given set of facts (Davidson *et al.* 2016, p. 4). With blockchain, no longer is a central authority required to authenticate or verify the data represented in a ledger. Rather, this "trust" function is distributed across a network of nodes or computers (Davidson *et al.* 2016, p. 5). According to proponents of this form of governance, removing the need for a central authority enhances trust in the ledger as all the problems attendant to a "single point of failure", for example, inefficiency and corruption are minimized if not eliminated. The resulting "high trust ledger" is said to create a "low transaction cost" economy which is necessary for economic growth (Davidson *et al.* 2016, p. 5).

The technology has further evolved beyond this high trust ledger and transfer of value use-cases as actors in industry explore the application of blockchain technology in combination with smart contracts to re-engineer various processes for enhanced efficiency (Gatteschi *et al*. 2020, p. 38). This argument has been expanded to interrogate the necessity of a strong central government which incurs high transaction costs associated with statecraft (Davidson *et al.* 2016, p. 5). Recent research has been dedicated to understanding the role that blockchain technology can play in replacing or at least complementing the government in its governance roles, as a measure towards reducing the high transaction costs incurred in public administration (Cheng *et al.* 2017; Lluis de la Rosa *et al.* 2017; Jalakas 2018). Within such a blockchain ecosystem comprising blockchain, human and other technological layers, such as that proposed here for case management, actions on the blockchain are referred to as "on-chain" transactions while related actions outside the blockchain are referred to as "off-chain" transactions or activities (Liu *et al.* 2022, p. 2).

As will be seen in Chapter Two, transaction costs refer to the costs of facilitating economic exchange or of running the economic system (Wallis and Dollery 1999, p. 66; Mikami 2011, p. 51; Alston *et al.* 2018, p. 75). Transaction costs have broadly been categorized as: (i) search and information costs, (ii) bargaining and decision-making costs, (iii) policing and enforcement

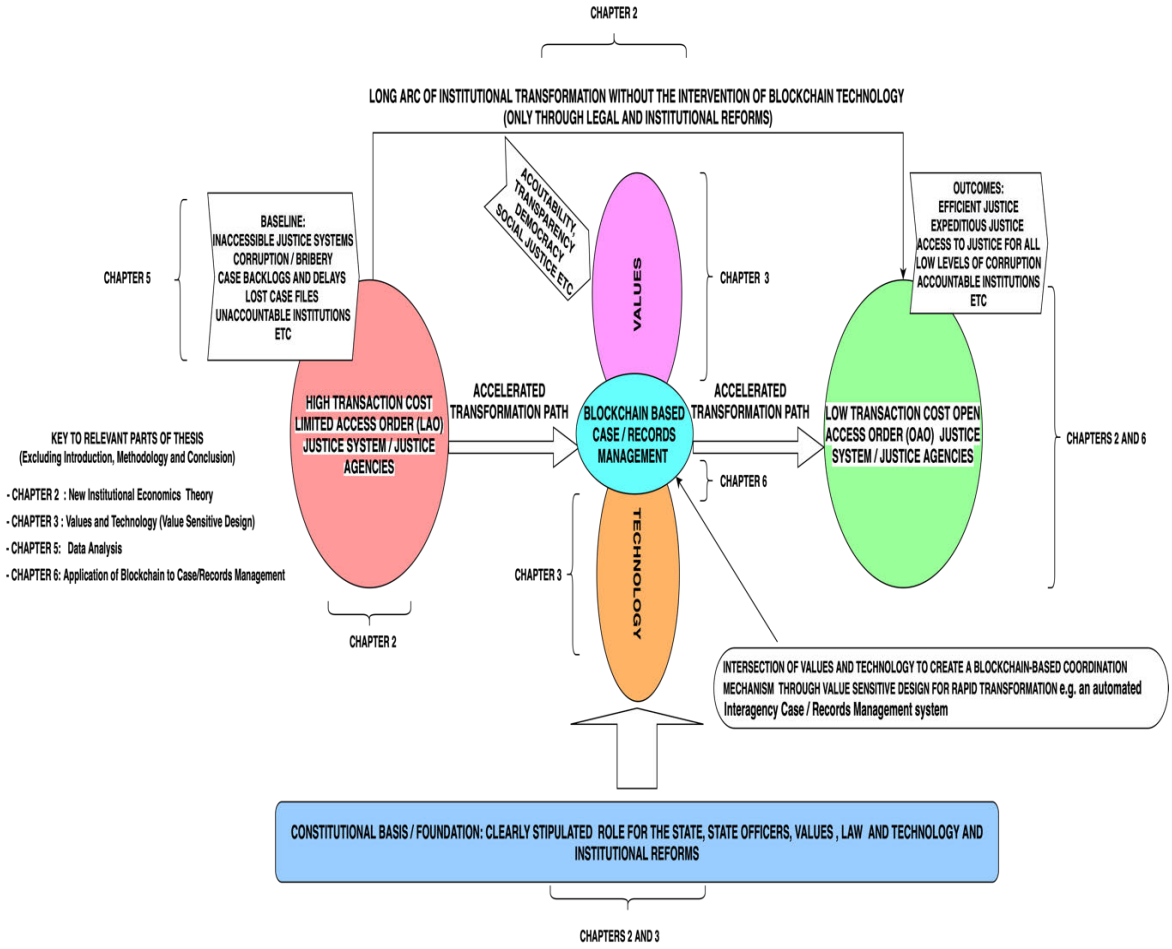
costs, (iv) participation and concentration (or network building) costs, and (v) awareness and compliance building costs (Makoto 2019, pp. 2, 7, 8; Dahlman 1979, p. 148). In the context of the formal criminal justice system, these costs can be summed up as the costs to justice sectors of delivering and implementing justice policies, as well as the costs to court users of accessing, obtaining, and enforcing justice (Barendrecht 2009, p. 4).

This thesis therefore examines the high costs within the justice sector in Kenya, which result from the lack of integrity, and inefficiency, and that impede access to, and the delivery of justice for Kenyans. It also interrogates the role that technology and specifically blockchain technology can play in mitigating some of these high transaction costs.

1.3 Structure of the Thesis

Diagram 4 below summarizes and provides an overview of the thesis by showing the connections between the themes explored in each chapter.

Diagram 4: Summary Depiction of the Thesis



Source: Author

The diagram illustrates how this thesis proposes a society can accelerate the transition from justice sector characterized by inefficient and corrupt institutions (red circle), that is, a limited access (high transaction cost) justice sector, to an open access (low transaction cost) justice sector that facilitates access to expeditious and efficient justice for all, illustrated by the green circle.

The thesis does this in Chapter Two by first interrogating the role of institutions through the lens of New Institutional Economics (NIE). In doing so, Chapter Two provides the theoretical basis for reconceptualizing the accelerated transformation of Limited Access Order (LAO) justice sector institutions into Open Access Order (OAO) justice institutions by envisioning "government as a platform" or Government 2.0. The thesis proposes that this can be done through the intersection of values (pink oblong) and technologies (orange oblong) in the design of blockchain-based coordination mechanisms, such as case, records, or information management systems (turquoise oblong). This accelerated transformation is contrasted in the diagram to the long path of institutional transformation, without the intervention of values oriented technological solutions such as blockchain-based case management systems.

Chapter Two presents the Open Access Order (OAO) as the zenith of this social transformation, that is, a society characterized by open access institutions such as accessible and efficient judicial systems where the fetters or limitations to participation by all citizens are substantially reduced if not eliminated (Ménard 2011, p. 17; North *et al.* 2009[b], p.110).

Chapter Three of the thesis examines the key factors that ought to be considered, at a conceptual level, in the adoption of technology as a governance mechanism. Foundational to such adoption therefore, is the consideration of values and principles which underpin governance in the said sector. In the diagram above values (pink oblong) are depicted to intersect with technology (orange oblong) through Value Sensitive Design (VSD) to implement enhanced coordination mechanisms or other technological tools that result in accelerated institutional transformation and better justice outcomes for court users. VSD is premised on the fact that human values, are incorporated in a systematic way into the design of technical artefacts (Poel and Kroes 2014, p. 104; Davis and Nathan 2015, p. 12; Freidman 1999, p. 3). Chapter Three therefore focuses on the values and principles of governance articulated in Articles 10 and 232 of the 2010 Constitution of Kenya. These values are summarized as (but not limited to): (i) Transparency, (ii) Accountability, (iii) Democracy and (iv) Social Justice.[23] The chapter concludes that any

[23] In Article 10(1) of the Constitution the national values and principles of governance are set out in full as follows: (*a*) patriotism, national unity, sharing and devolution of power, the rule of law, ***democracy and participation of the people;*** (b) human dignity, equity, ***social justice,*** inclusiveness, equality, human rights, non-discrimination

technology adopted in the realm of governance within the justice sector must at a minimum, embody and advance these values.

Chapter Four of the thesis presents the research methodology. A mixed methods approach employing both quantitative and qualitative methods is adopted which includes the following three components: (i) A survey of justice sector actors from virtually all the national criminal justice agencies as well as the most relevant Non-Government Organisations (NGOs) or independent bodies, (ii) Interviews of key informants who comprise of senior justice sector officials knowledgeable in interagency interactions or ICT uptake within the justice sector, as well as external experts on the sector, and on blockchain-based e-justice, (iii) Finally, secondary research is also employed to complete and triangulate the information obtained from the survey and interviews.

The results of this analysis are presented in Chapter Five of the thesis which in its conclusion presents the value oriented, and operational gaps which can be addressed though the deployment of technology, among other interventions. Chapter Five of the thesis shall effectively outline the baseline or status of Kenya's administration of justice depicted in ***Diagram 4*** above, in terms of values adoption, technological uptake and interagency coordination. The chapter also presents considerations and assumptions that must be taken into account, that would undergird the successful implementation of technology such as: internet connectivity, skilled staff as well as an enabling legislative framework. Chapter Five also addresses the impact and momentum created for accelerated institutional change by "constitutional moments" and other unforeseen transformative events such the COVID-19 pandemic, or other crises.

Chapter Six circles back to the idea of Government 2.0, that is government aided by technology, and premised on the values of transparency, accountability, democracy or participation, and social justice. Blockchain is in this chapter analysed as a potential mechanism for the accelerated transformation of the justice sector, specially through its deployment in case management technology. The Chapter also outlines some of the potential challenges and

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and protection of the marginalised; (c) good governance, integrity, ***transparency and accountability***; and (d) sustainable development. Transparency and accountability are important values for the Kenyan context, and are for the purposes of this discussion, discussed as distinct but highly correlated values, pursuant to the prevailing academic literature. Sustainable development is not discussed in this thesis as a "value" of ethical importance but is rather viewed as an outcome of societal transformation.
Available at: http://www.kenyalaw.org:8181/exist/kenyalex/actview.xql?actid=Const2010 [Accessed 9 May 2020].

concerns that should be addressed in considering the implementation of this technology within the criminal justice context. Chapter Seven concludes the discussion in the thesis.

1.4 Conclusion

The unique contribution of this thesis therefore, is its analysis of the transformation of Kenya's criminal justice institutions, through the lens of NIE theory, by deploying blockchain technology, on a foundation of constitutional values of ethical importance. In essence this thesis explores the potential for technology to accelerate the transformation of Kenya's justice sector to the OAO ideal.

Nevertheless, this research into the application of blockchain in the criminal justice sector is novel, and therefore serves as an exploratory exercise which can inform further research into the subject. The research findings discussed here are therefore largely indicative of the outcomes anticipated, rather than real life outcomes. For these reasons, no hypothesis testing is carried out.

It is therefore hoped that the research presented here, provokes further critical discourse on the role of technology in the administration of justice, and in particular the role of emerging technologies such as, blockchain and Artificial Intelligence (AI). In this regard, an important question the thesis attempts to answer is: how should the role of government be reconstituted, with the emergence of technologies with governance capacity, or technologies that can facilitate new paradigms of decision making? This governance or decision-making role has so far been the sole preserve of the State and its machinery.

While this question is much larger than the scope of this thesis, the potential impacts and challenges of such technological adoption is explored here. This is done to better understand justice sector outcomes as a result of the interaction between the State and its institutions of governance with technologies of governance, in the present post-COVID-19 digital age.

2.0 NEW INSTITUTIONAL ECONOMICS AND THE JUSTICE SYSTEM

"Modern institutional economics should study man as he is, acting within the constraints imposed by real institutions. Modern institutional economics is economics as it ought to be."

(Ronald Coase 1984 in Douglass North 1986 p. 230)

This chapter lays the theoretical basis for understanding the transformation or reform of societies, and societal structures – particularly with respect to the administration of justice. Its unique contribution will be to apply New Institutional Economics (NIE) to the context of public policy-making, and the allocation of "public goods" in the justice sector. Wallis and Dollery point out that NIE (particularly its transaction costs and agency theory strands), provides powerful descriptive and predictive conceptual tools in the analysis of the public sector, including in its role of policy formulation and implementation and organisational design (Wallis and Dollery 1999, pp. 71-75). In essence, NIE shall be the lens through which this thesis examines how institutional arrangements, impact on the formulation and implementation of polices in the justice sector, that is, "justice policies" (Lahat 2020, p. 1; Barendrecht 2009, p. 4; Wallis and Dollery 1999, pp. 71,73).

The first goal of this chapter shall be to examine the frictions or "transaction costs" that emerge from the processes that result in the formulation of the justice polices that govern the allocation of "property rights" to the said public goods. In particular, section 2.2 examines the role of hierarchies, which were first defined by Ronald Coase, and their attendant principal-agent relationships, in mitigating or exacerbating transaction costs in policy making and implementation. It emerges from this discussion that institutional change or reform is key to societal transformation.

The second goal of this chapter shall therefore be to examine the transition of Limited Access Orders (LAOs) or societies characterized by limited access institutions, into Open Access Orders (OAOs) characterized by open access institutions. It shall be argued in sections 2.3 and 2.4 that the ultimate goal for societal transformation shall be to transition LAOs into OAOs, so that the fetters to participation in the economy or in the present case, the justice sector (i.e., transaction costs) are substantially reduced if not eliminated.

The role of technology, and in-particular communication technology in facilitating or accelerating this transition is examined in section 2.5. Sections 2.6 and 2.7 discuss the paradigm of "Government 2.0" or "government as a platform". Government 2.0 describes a context where government, with the aid of collaborative technologies founded on open data standards, acts as a mechanism for collective action. This is said to result in the "Coasean collapse", or

the collapse of hierarchies to give way to a more participatory or "open" and therefore low transaction cost form of governance.

Section 2.8 examines the concept of e-justice as open justice while section 2.9 looks at Kenya's brief experience with the open data movement through the multi-country initiative – the Open Data Partnership (OGP). This latter discussion shall provide a basis for examining some of the pitfalls of implementing reforms without adequately taking into account the relevant context and its' actors. The discussion in this chapter, sets up the discussions in Chapters Five and Six on the role that blockchain as the "new institutional technology of governance" can play, in mitigating the highlighted transaction costs, for a more open and accessible justice sector.

2.1 New Institutional Economics and the Concept of "Institutions"

New Institutional Economics (NIE) is an interdisciplinary enterprise[24] that seeks to understand and explain economic performance by examining the rules (both formal and informal) also known as *institutions*, that structure economic, political, and social interactions in a society (Drobak 2008, p. 1; Wallis and Dollery 1999, p. 62; Klein 1998, p. 1). NIE's seminal contribution to economic theory was the introduction of institutional realism into economic analysis (Wallis and Dollery 1999, p. 61). NIE emerged in response to the lack of realism in neoclassical economic theory, which assumed away the "frictions" present in economic systems (Drobak 2008, pp. 2-8; Posner 1993, pp. 74-75).

Some of these unrealistic assumptions adopted by neoclassical or "blackboard" economists are that: individuals and firms are rational maximizers, that information is costless, and that demand curves are infinitely elastic (Drobak 2008, p. 3). Neoclassical economic theorists therefore ignored the impact of frictions created by: the political environment, opportunistic behaviour, bounded rationality or imperfect foresight, principal-agent problems and the information asymmetries that they engender on the trading parties' ability to draw up strictly enforceable and complete contracts (Drobak 2008, pp. 2-3; Wallis and Dollery 1999, p. 68; Richter 2008, pp. 27-28; Alston *et al.* 2018, p. 113).

Ménard and Shirley point out that the lack of a settled definition of "institutions" remains an area of concern in the study of institutions (Ménard and Shirley 2014, p. 558). However, institutions have been generally defined as *"humanly devised constraints that shape human*

[24] Or a collection of ideas incorporating economics, law, organisational theory, political science, sociology and anthropology.

interactions" (North 1990, p. 3). According to North, institutions comprise the full spectrum of rules and mechanisms that constrain individual behaviour by providing a set of incentives or disincentives for individuals (North *et al.* 2006, p. 20; North 1986, p. 231). North also notes that institutions provide a framework which gives people confidence in how various outcomes will be determined (North 1986, p. 23; Lahat 2020, p. 1). NIE is therefore characterized by its focus on: (i) institutions as determinants of economic and political development or performance, (ii) the role of the firm and other market organisation in addressing transaction costs and (iii) the ramifications of these factors for public policy (Ménard and Shirley 2014, p. 542).

In the context of politics and public policy-making, institutions are considered to be the *"rules of the game of political exchange"* (Spiller and Tommasi 2003, p. 282). Institutions in this realm include: constitutions, formal government such as congress, ministries, the central bank, local government, and other government agencies (Lahat 2020, p. 1). North however distinguishes "institutional forms" as explicit or formal institutional arrangements like a written constitution and "mechanisms" that represent how institutional forms are implemented and sustained e.g., the rules and agencies that oversee the electoral process (North *et al.* 2007, p. 25). According to North, institutional forms do not include belief or culture (North *et al.* 2007, p. 25). Other authors distinguish between the "institutional environment" as the formal or informal rules that govern human behaviour, that is, the constitution, other laws, and norms, and "institutional arrangements" as the governance structures or guidelines that structure or mediate economic or political relationships (Klein 1998, p. 3). These include business firms, contracts or contractual agreements, public bureaucracies (e.g. in the present context judiciaries and other justice sector agencies), and not-for-profit organisations (Klein 1998, p. 3).

In the context of public administration, institutions determine the "transactions" (discussed in greater depth below), that public sector actors can undertake, and therefore the quality and consistency of the emerging policies (Spiller and Tommasi 2003, p. 281). In Chapter Five, we shall see that the lack of coherence in polices within the criminal justice system, has been a key challenge in Kenya, due to the lack of interagency coordination in policy-making and implementation, especially prior to the creation of the National Council on the Administration of Justice (NCAJ).[25] This analysis is therefore relevant as the emerging idiosyncratic policies in Kenya's public sector have resulted in poor or inefficient outcomes for the country (Hope

[25] The NCAJ is a high-level policy-making, implementation and coordinating mechanism established by the Judicial Service Act of No. 1 of 2011. NCAJ was formally launched on 11 August of 2011 and has a membership comprising national justice sector agencies, Non-Governmental Organisations and other actors working on matters related to human rights, children, and the provision of legal aid, as well as the private sector. See the NCAJ website: https://ncaj.go ke/about/ [Accessed 9 April 2021].

2012). Spiller and Tommasi also attribute the lack of coherent public policy in Argentina to *adhoc* and decentralized policy-making practices, including the lack of coordination among sector secretariats (Spiller and Tommasi 2003, p. 284).

Other scholars focus on informal institutions, that is, *"a system of shared beliefs and internalized norms"* (Ménard and Shirley 2014, p. 558). Norms have also been described as long standing or repetitive patterns of behaviour, actions and practices, shared by a subset of people in a society or organisation (Alston *et al.* 2018, p. 1; Lahat 2020, p. 1). Informal institutions may also constitute informal structures such as, *"networks, practices and stable relationships between different actors in the policy process"* (Lahat 2020, p. 1). These institutions are also important in the criminal justice context as they directly impact on the pace and nature of institutional transformation. Importantly for this thesis, they also have practical implications for factors such as technological adoption, particularly where there is resistance to change.

NIE literature also establishes that norms and formal institutions can at times be in conflict, in which case one (most likely formal institutions), may displace the other (Alston *et al.* 2018, pp. 20-21). The literature further establishes that both formal and informal institutions exist within the context of core beliefs, that is, the belief of how institutions impact on economic, social, or political outcomes. (Alston *et al.* 2018, p. 21). Core beliefs are especially significant where the anticipated foregoing outcomes diverge dramatically from actual outcomes e.g., climate change, economic crisis, or war (Alston *et al.* 2018, pp. 21-22). These shocks present time-bound opportunities for major shifts in core belief systems, and the reform or radical transformation of institutions which govern how humans and entities interact, that is, – "constitutional moments" (Alston *et al.* 2018, pp. 21-22). The discussion to follow turns to the role of institutions and institutional forms in mitigating transactions costs.

2.2 The Importance of Institutions in Mitigating Transaction Costs

Ménard and Shirley outline the theoretical basis of NIE,[26] in the context of economic exchange, as follows:

> *"...because transaction costs are positive, information is costly and incomplete, and contracts and property rights are imperfectly defined and enforced. Under such*

[26] As distinguished from mainstream or classical economics.

> *circumstances, the institutional framework is a crucial determinant of economic performance"* (Ménard and Shirley 2014, p. 546).

Transactions have been defined as the *"agreed transfer of goods and services across technologically separable boundaries"*, while in general terms the costs involved in facilitating this transfer or economic exchange are referred to as "transactions costs" (Wallis and Dollery 1999, p. 66). NIE also views transactions as entailing trade of the exclusive "rights" to the assets, property, or a service, rather than of the commodities themselves (Ménard and Shirley 2014, p. 545).

Transaction costs have more specifically been defined as the costs of measuring the different dimensions of goods and rights being exchanged, and the costs of enforcing the rights obtained from these transactions, or the resources used to establish and maintain those (property) rights (Drobak 2008, pp. 2-3; Alston *et al.* 2018, p. 61). This includes the costs of negotiating and facilitating economic exchange in the market, the cost incurred in dispute resolution, in addition to the costs incurred in capturing and protecting the assets in relation to other actors (Wallis and Dollery 1999, p. 66; Alston *et al.* 2018, pp. 61-62). Alston *et al.,* elaborate that transaction costs are also the resources expended in preventing, "stealing, shirking, cheating rent seeking" (Alston *et al.* 2018, p. 80). In sum, these costs arise when economic agents take steps to obtain information on price and quality, identify parties they wish to transact with, negotiate, define, monitor, and enforce compliance with the contractual terms (Loasby 2015, p. 251; Ménard and Shirley 2014, p. 544). According to Oliver Williamson a leading NIE theorist, the key determinants of transaction costs are: asset specificity, frequency of transactions and uncertainty in the behaviour of the contracting party (Poniatowicz 2017, p. 330).

Transaction costs are therefore broadly categorized as: (i) search and information costs, (ii) bargaining and decision-making costs, (iii) policing and enforcement costs, (iv) participation and concentration (or network building) costs, and (v) awareness and compliance building costs (Makoto 2019, pp. 2, 7, 8; Dahlman 1979, p. 148). NIE however rejects the notion of "infinite transaction costs" where it is impossible to capture or enforce one's property rights as they would immediately be expropriated (Alston *et al.* 2018, p. 80). In this regard, while Alston *et al.,* acknowledge transaction costs are an expected part of economic or political exchange, they nevertheless argue that these costs are finite, so that such exchange is still possible or enforceable in many cases (Alston *et al.* 2018, p. 80).

Transaction costs are therefore the costs incurred in organizing and running the economic system, but as we shall see below, they also occur in social and political spaces (Wallis and Dollery 1999, p. 66; Mikami 2011, p. 51; Alston *et al.* 2018, p. 75). In fact, Alston *et al.,* note that virtually anyone can incur these costs, i.e., individuals, families, firms, government, or any other organisational form within the context of a social setting (Alston *et al.* 2018, p. 61).

2.2.1 Transaction Costs in the Public Sector

In the context of the public sector which this thesis examines, one may simply view transaction costs as the costs of "organizing society's resources" (Alston *et al.* 2018, p. 61). More specifically, this thesis sees transaction costs as applying to: *"(i) the creation or change of an institution or organisation and (ii) the use of the institution or organisation"* (Wallis and Dollery 1999, p. 66).

North argues that political or public sector markets are more prone to inefficiency, and higher transaction costs than economic markets (Ménard 2011, pp. 7-8). Poniatowicz (2017) extends Oliver Williamson's determinants of transaction costs (noted above),[27] to the public sector, where the assets being exchanged are public goods such as "justice", through court and other criminal justice mechanisms. She notes that goods subject to exchange within the public sector are not only "specific in nature", they are also "special types of goods" (Poniatowicz 2017, p. 330). One can easily agree with this characterization. Justice, rule of law, among other public utilities and services, and the policies that enable their provision are not only fairly well-defined concepts – they also belong to a special category of goods, when compared to market commodities where negotiations focus on price and quantity (Alston *et al.* 2018, p. 111).

Poniatowicz also agrees with Wallis and Dollery that the consumption of public goods is "non-rival in nature", meaning that while being consumed by one person, they cannot simultaneously be consumed by another (Poniatowicz 2017, pp. 330-331; Wallis and Dollery 1999, p. 19). Transactions in the justice sector, though, do not conform to this principle, and indeed may provide a useful illustrative example of how transactions in the public sector might involve rival claims and interests. Transactions in the justice sector, particularly in common law jurisdictions such as Kenya, are adversarial. Barendrecht illustrates this point by observing as follows:

[27] Asset specificity, frequency of transactions and opportunistic behaviour of the contracting party.

> *"Obviously, buying justice is not a straightforward transaction such as purchasing a car or obtaining a loan from a bank. Behind the need for justice, usually a conflict of interest with the defendant is looming. The defendant may not cooperate to delivery of a just outcome. What a just outcome is, may also be unknown. A lawyer, or even a judge, has interests that are not perfectly aligned with those of her clients. So, clients have to monitor the performance of the lawyer and the judge and should probably invest in means to ensure that they do their job. These extra costs that a client faces on his way to justice can be studied as transaction costs."* (Barendrecht 2009, p. 4).

In corrupt regimes this "competition" creates opportunities for rent-seeking, as the mediating entity, that is, the court or other public authority, looks to maximize its benefits in allocating the rights to the property in contention. As the Hiil research shows,[28] such gaps in integrity have plagued the Kenyan justice system, leading to the perception that the formal justice system favours the powerful and wealthy, or is not "socially just" (Hiil 2018, pp. 86-88).

Poniatowicz also argues that the public sector has fewer transactions than the private sector, which also results in higher internal and external transaction costs for the public sector (Poniatowicz 2017, p. 330). One can agree with this characterization. Indeed, public sector transactions such as policymaking, which are of particular interest to this thesis, are singular or seminal events with long lasting impacts. In this regard, the costs would include those incurred in negotiating the accruing rights and responsibilities, and obtaining the requisite consensus of the stakeholders who seek to secure their positions in maximizing the benefit for their constituents, principals or special interest groups (Poniatowicz 2017, p. 331).

In conceptualizing the internal and external transactions costs that may be incurred in the public arena, Poniatowicz references the work of Furubotn and Richter (2005), who provide a helpful differentiation here. The first is market transactions costs, that is costs incurred in negotiation and acquisition of information (Poniatowicz 2017, p. 332). The second is managerial transaction costs, that is, internal costs generated by the organisation, for example in the execution of managerial contracts (Poniatowicz 2017, p. 333). It is in this context that one would encounter principal-agent costs.

The final categorization provided by Furubotn and Richter (2005) is political / public transaction costs, which are the costs incurred in the provision and enforcement of public goods

[28] The Hague Institution for Innovation of Law (HiiL) in cooperation with the Judiciary of Kenya, conducted a nationwide Justice Needs and Satisfaction Survey of 6005 randomly selected participants in 2017, to map out the demand and supply of justice services in Kenya.

by public sector entities and public decision makers (Poniatowicz 2017, p. 333). Importantly, this final category includes the costs of reforming, organizing, maintaining the public order of the given system, to enable the "efficient" provision or allocation of the said goods (Poniatowicz 2017, p. 333).

Poniatowicz notes that in NIE, "efficiency" is viewed as a key evaluation standard for the operation of organisations (Poniatowicz 2017, p. 333). NIE theorists do not endorse neo-classical economists' measure of allocative efficiency as the "optimization of relations between expenditures and economic effects" in a given institutional environment (Poniatowicz 2017, p. 329). NIE theorists prefer "procedural, adaptive or NIE efficiency", which acknowledges that in the real world, transaction costs can never be zero, and incomplete contracts can at best be efficient within a framework of bounded rationality[29] (Richter 2008, pp. 13, 29). The section that immediately follows interrogates the role of "hierarchies" in mitigating transaction costs both in the private and public spheres.

2.2.2 Hierarchies and Agency Relationships in the Private and Public Sector

Transaction cost theory seeks to define the properties of transactions to determine which institutional, organisational or governance arrangements are optimal in minimizing the costs associated with those transactions (Wallis and Dollery 1999, pp. 66-67). Richter notes that contracting parties in this context will revert to "three generic forms of governance", that is markets, hierarchies such as the firm and hybrids or "private orderings" as a substitute for often ineffective and expensive "court orderings" (state intervention), to protect themselves from opportunistic behaviour (Richter 2008, p. 28). In the latter case, the court restructures the terms of the imperfect contract as the parties would have required if the contract were perfect (Richter 2008, p. 21).

According to Coase, a rational economic actor will opt between using the market or hierarchies in managing transaction costs, depending on the option cheapest to them (Wallis and Dollery 1999, pp. 66-67). The firm would reduce these costs by replacing bargaining with multiple owners of the factors of production, with coordination by a hierarchy (Ménard and Shirley 2014, p. 544). According to Coase, firms develop organisation structures within their

[29] That is, an actor's inability to accurately capture and synthesize all relevant present and future information for the drawing up of a complete contract.

hierarchies that are tailored towards certain classes of problems, so as to economize on transactions costs (Loasby 2015, p. 252; Ménard and Shirley 2005, p. 4).

Coase concluded that this is the reason why firms exists, and all transactions are not done through the market place, where one would have to singularly meet the search, negotiation or enforcement costs (Ménard and Shirley 2005, p. 4; Wallis and Dollery 1999, p. 66).

According to Wallis and Dollery, the firm and market co-exist as mechanisms for economic coordination, as rational economic actors, in looking to minimize their transaction costs will choose the mechanism cheapest to them (Wallis and Dollery 1999, p. 66). In essence, this discourse introduced the concept of "governance structure" or "organisational design" as the ultimate response to transaction costs, both internal (within hierarchies), and external, that is, within incomplete contracts (Richter 2008, pp. 26-27).

According to North, organisations are concrete, coordinating decision-making and executing entities made up of a mix of *"specific groups of individuals pursuing a mix of common and individual goals through partially coordinated behaviour"* (North *et al.* 2006, p. 20). North further describes organisations as "flesh and blood entities" which act (North *et al.* 2006, p. 20). He notes that organisations have an institutional structure, both formal and informal (also known as organisation forms), which dictate how individuals within the institutions interact among themselves, and how the organisation and its members interact with external parties (North *et al.* 2006, pp. 20-21). In his earlier works, North described organisations as entities that exist to capture the gains from specialization and division of labour in the execution of contracts (North 1986, p. 231). He noted that the "firm" as a type of hierarchy or organisation is nothing but a "nexus of contracts" falling under one umbrella contract (North 1986, p. 231). Like Coase, he believed that organisations are ways to reduce the cost of contracting between parties (North 1986, p. 231).

Wallis and Dollery note that public agencies are more reliant on bureaucracies (hierarchies) with *"multiple levels of principal-agent relationships",* than are private entities (Wallis and Dollery 1999, p. 73). This is a likely reason for the higher transaction costs and inefficiency of the sector as the bureaucratic nature of these organisations creates more opportunities for opportunistic behavior,[30] due to the absence of profit maximizing considerations to incentivize close monitoring of agents by the principals (Wallis and Dollery 1999, p. 73).

[30] Principal-agent relationships are at the core of Public Choice Theory.

The policy-making process in particular is characterized by a network of principal-agency relations fraught with problems of asymmetry of information, which result in transaction costs that impact on the parties' abilities to effectively establish contracts and structure the relationship (Alston *et al.* 2018, p. 113). These processes are therefore vulnerable to bureaucratic inefficiencies, external political pressure and uncertainty, which often results in incomplete contracts (Poniatowicz 2017, pp. 331-332).

In the context of government and policy-making therefore, where high transaction costs caused by principal-agent problems limit one's ability to reform the system, institutions play a crucial role in determining better outcomes (Alston *et al.* 2018, p. 117). Spiller and Tommasi find that while policy actors may have a common interest in having policy address a given societal crisis, the heterogeneity or differences in preferences, and / or the distributive nature of politics generates conflict (Spiller and Tommasi 2003, p. 286). They add that in bad transaction environments, policy actions are likely to be less cooperative and therefore less well coordinated, with the result that welfare policies or reforms are not undertaken (Spiller and Tommasi 2003, p. 286).

2.2.3 NIE as the Study of Institutional Transformation

Reference to institutional change or transformation implies a tacit recognition of the fact that, while it is true that institutions influence behaviour, they too are influenced by people and groups – a concept referred to as methodological individualism (Lahat 2020, p. 2). Public policies therefore affect, and are affected by institutions (Lahat 2020, p. 3). Douglass North's research on NIE extrapolates the core concepts of NIE to the wider institutional environment by analyzing the impact of the State, polity and ideology on institutions and institutional change (Ménard 2011, p. 2). His macro-analysis is particularly relevant to the present thesis and discussion of institutional reform in the justice sector. North was concerned with the nature of the State, specifically why political markets do not function like economic markets, and the role of technology in harnessing such transformation (North *et al.* 2006, 2009, 2011; Ménard 2011, p. 5). He also sought to explain the institutional disparities between rich and poor countries, by analyzing economic development in Europe and North America (Ménard 2011, pp. 5, 7-8, 12-13; Ménard and Shirley 2014, p. 550). Ménard highlights the following parameters for both economic and political development, as presented by North:

> *"In addition to capital accumulation, being developed economically entails having sophisticated economic organisations and credible enforcement of property rights and*

other contractual commitments. Similarly, being developed politically entails having rule of law, a constitutional setting in which all major players accept changes of power, effective legal recognition of organisational rights independently of who is in power, and state control of organized violence." (Ménard 2011, p. 17).

North prefaced his thesis with a rejection of certain long held beliefs in theories of economic growth. First, he rejected neoclassical assumptions that institutions were intrinsically efficient (Ménard 2011, pp. 12, 14; Ménard and Shirley 2014, pp. 549-550; North 1990, p. 63). Second, he countered the notion that neoclassical tools were by themselves sufficient to explain the societal change that characterized European society from the medieval ages (Ménard 2011, pp. 12, 14; Ménard and Shirley 2014, pp. 549-550; North 1990, pp. 112-116, 133-134). Finally, he also challenged the notion that technological change was the catalyst for increased productivity and economic growth (Ménard 2011, pp. 12, 14; Ménard and Shirley 2014, pp. 549-550; North 1990, p. 133).

Rather, North perceived two key forces behind institutional change, which foster economic or political development. The first of these forces was the establishment of "efficient economic organization", which entailed new institutional arrangements such as written contracts enforced by the law (Ménard 2011, p. 13; North 1990, pp. 118-130). He argued that efficient economic organisation succeeded in realizing western economic development as it enabled these nations to develop economies of scale through sophisticated and specialized corporations and companies, they also reduced market imperfections and encouraged innovation (Ménard 2011, p. 13; North 1990, pp. 118-130). Conversely, nations remained poor because institutional constraints define a set of economic or political payoffs that do not encourage productivity (Ménard 2011, p. 14; North 1990, pp. 134-135).

The second force was ideology, belief systems and mental models (Ménard 2011, pp. 14-15). North argued that incremental change can only occur when the economic and political elites who have the bargaining strength to change institutions, perceive that they, "*could do better by altering the existing institutional framework at some margin"* (Ménard 2011, p. 14; North 1990, p. 8). He warned that radical reforms are nevertheless inhibited by: (i) incomplete information and the bounded rationality of the said economic or political entrepreneurs, (ii) path dependence resulting in continuity of policies and (iii) existing mental models shaped by inherited belief systems, past experiences and norms (Ménard 2011, pp. 14-15; Lahat 2020, p. 3). North argued that societies get "stuck" because their institutions lack the capacity to resolve the new societal complexities that they are confronted with (Ménard and Shirley 2014, pp. 550-

551). He explained that this is a key reason why importing new rules, regulations or constitutions into such societies has remained largely unsuccessful in bringing about the societal change desired (Ménard and Shirley 2014, pp. 550-551).

NIE is however criticized for not presenting a fully robust theory of institutional change; the Northian branch more so for making such change seem especially difficult to accept in societies with long standing conventions that are slow to change (Ménard 2011, pp. 24-25). However, North does provide a reliable analytical basis for understanding institutional change and, more importantly, for conceptualizing what a transformed society, with low transaction costs and efficient systems should look like. This transformation process is described as a long process of incremental change, which reaches a tipping point when a "limited access society", is transformed into an "open access society" – both of which are defined below (Ménard 2011, pp. 17, 24-25). The discussion on the transition between social orders is important as it provides an analytic backdrop to the discussion on the role of technology in accelerating the transformation of societies.

2.3 Social Order, the Control of Violence and Institutions

This analysis of social orders, which has largely been advanced by North, Wallis, Webb and Weingast (North *et al.* 2006, 2007, 2009[a] and 2011), provides the conceptual framework through which one may understand the dual challenges of development and violence in developing nations (North *et al.* 2007, pp. 2-3). North *et al.* (2007) intended this conceptual framework to be the lens through which one may appreciate the persistence of poverty and underdevelopment in emerging nations, despite wide-ranging national and international interventions (North *et al.* 2007, pp. 4-5). They also intended that the framework explains the role of societal structuring in maintaining this status quo, as well as the factors which precipitate transformational change (North *et al.* 2007, pp. 4-5). The discussion to follow shall closely examine the characteristics of both limited and open access social orders, as a prelude to the discourse on judicial transformation both in Kenya, and the role of technology in facilitating access to justice.

Limited Access Orders (LAOs) or "natural states" are said to have emerged five to ten thousand years ago as human societies transitioned from the foraging, hunter and gatherer social orders (North *et al.* 2009[a], p. 56; North *et al.* 2011, pp. 4-5). The LAO was the State's organisational or "natural" response to the threat of violence, hence the reference to this institutional form as the "natural state" (North *et al.* 2011, p. 5). The State in this context, should not be understood

in terms of the meaning assigned to it in modern day political nomenclature. Rather it should be understood as an organization, that is:

> *"…a group of individuals pursuing a mix of common and individual goals through partially coordinated action"* (North *et al.* 2006, pp. 12, 23).

Essentially, single actor monarchs, bandits or individuals cannot comprise a "State" (North *et al.* 2006, p. 12). This definition signifies a convergence in the desire to protect the different economic interests of an elite class, through some form of political or human organization. North *et al.* conclude that three key social orders – *"primitive", limited, and open* – structure organisations in fundamentally different ways (North *et al.* 2006, p. 5).

In the Limited Access Order (LAO), powerful groups, elites, and those with the monopoly over violence form political coalitions to create, allocate and enforce exclusive rents, rights and privileges from government contracts, land rights, exclusive trade rights and natural resource royalties (North *et al.* 2011, p. 2). The LAO therefore enables the dominant coalitions to extract surplus value from land, labour, and capital, and allows some degree of specialization, to the extent that it is compatible with the interests of the coalition (North *et al.* 2006, pp. 15-16). The elites however do not disarm but leverage on their relative strength to ward off threats to their stake by other emerging elites, as well as non-elites in the new social order (North *et al.* 2006, pp. 11-12). The "exclusion" of non-elites also ensures that the non-elites cannot compete and therefore compromise the elite groups' rents, or organize to threaten their political, social, or economic dominance (North *et al.* 2011, p. 5). The LAO paradigm therefore works by ensuring that non-elites face high transaction costs in making any inroads to the privileges enjoyed by the elites (North *et al.* 2006, pp. 15-16).

This shared prosperity among the elites therefore incentivizes the members of a dominant coalition to make "credible commitments" to maintain the social equilibrium by avoiding conflict (North *et al.* 2007, p. 8; North *et al.* 2006, pp. 11-12). Non-elites unwilling to lose the limited benefits of this social equilibrium support the *status quo* which largely favours the elites (North *et al.* 2006, p. 10). In the LAO or natural state, political and economic interests are therefore inextricably blended, to create a set of incentives compatible with institutional arrangements (self-enforcing agreements), which are key to the foundation of the State, the creation of property and economic rights, as well as social order (North *et al.* 2006, pp. 11-14, 29). According to North, LAOs progressed through three phases of maturity, that is from

"fragile", to "basic" and finally "mature" LAOs – the fragile LAOs being the most volatile, while mature LAOs are the least volatile (North *et al.* 2007, pp. 11-15).[31]

Nevertheless, these arrangements for the control of violence by LAOs often fail as societies expand. No longer can political ties between a few dominant groups with personal ties be expected to maintain the negotiated equilibrium (North *et al.* 2009[a], p. 58). Any internal or external shocks that could cause a redistribution of elite interests or leverage within the dominant coalition, such as demography, weather, economic cycles, or even new technology, pose a threat to the stability of the coalition (North *et al.* 2006, pp. 9-10). In fact, LAOs never succeed in eliminating violence, as their political landscape is subject to reconfiguration as coalition members constantly reassess the strength of individual members (North *et al.* 2006, p. 15).

Therefore, for North, no LAO is sustainable due to the failure of this social order to fully control violence. This failure of LAOs to control violence necessitates the emergence of Open Access Orders (OAOs), which control violence through the use of "institutions" (North *et al.* 2009[a], p. 58). OAOs are said to have first emerged in the 19th century and were closely linked with the political and economic development of western societies (North *et al.* 2009[a], p. 56). In this era, the importance of elitism in facilitating access to rights and resources declined, giving way to (non-violent) competition and open access to economic and political organisation or participation (North *et al.* 2009[a], pp. 61-62).

In the OAO, ordinary citizens therefore have the ability to form political, or economic organizations, which encourages others to create organisations which compete for the same rents (North *et al.* 2009[a], p. 62). Those negatively impacted by this competition for rents are also able to mobilize in protest (North *et al.* 2009[a], p. 62). In contrast, a different form of competition exists in LAOs – which involves establishing political dominance through military might (North *et al.* 2006, pp. 17-18). This competition invariably has one outcome: limiting economic competition for the benefit of the dominant political actors, and by extension, the "exclusion" of the less dominant or vulnerable (North *et al.* 2006, pp. 17-18).

[31] Fragile LAOs also have rudimentary institutional structures and virtually no private organisations. The basic LAO on the other hand, has better control over the outbreak of violence as the State is more durable. However, it still limits private organisation outside of its dominant actors. In mature LAOs a wider range of state sanctioned private organisations exist outside of the State – thus allowing for some specialization between economic and political actors. They also have a breadth of law and policy that define the offices and functions of the State, and, provide mechanisms for dispute resolution. Elite private organisations in mature LAOs therefore have some latitude in their ability to check the abuse of power by the political elite. Mature LAOs therefore present the most resilient social orderings within LAOs.

OAOs therefore maintain their equilibrium by allowing political and economic groups to organize and reconstitute themselves accordingly, to defend their interests, in response to political or other pressures, through a process of "Schumpeterian creative destruction" (North *et al.* 2011, pp. 9-10; North *et al.* 2009[a], p. 62). Schumpeterian creative destruction occurs when there are no barriers to entry and the creation of organisational forms, for example, corporations for economic actors (North *et al.* 2007, p. 18). These economic actors are expected to retain their competitive edge through innovation rather than political or economic manipulation of the social order (North *et al.* 2007, p. 18). Creative destruction therefore ensures a political and economic environment that is dynamic, and that evolves through democratic electoral and other processes, so that no group can entrench its dominance through rent creation (North *et al.* 2009[a], p. 63). In an OAO, rents incentivize Schumpeterian competition, while in the LAO they exist as such competition is stifled (North *et al.* 2006, p. 19).

OAOs therefore have the positive characteristic of adaptive efficiency, that is, the ability to adapt in the face of an unpredictable political, social, and economic shocks (North *et al.* 2009[a], p. 63). This is because such societies are said to encourage and nurture the generation of new ideas to deal with unprecedented challenges (North *et al.* 2009[a], p. 63).

Flowing from the above, control over violence in OAOs is consolidated in the military and police forces, which are controlled by political institutions. The political institutions are in-turn checked by constitutional institutions such as the Judiciary (North *et al.* 2011, pp. 9-10). The control over the illegitimate use of violence in large OAOs therefore occurs in one of two ways. First, through prescriptive measures that prohibit the use of violence vested in the State, by non-state actors (North *et al.* 2009[a], p. 61). Constitutions are for this and other reasons, regarded as sitting on top of society's hierarchy of the institutional forms (Alston et al. 2018, p. 14). This is because the constitution sets out the rules to be followed by other laws of society, including the rules for making and amending other regulations (Alston et al. 2018, p. 14). Constitutions also set out the fundamental principles of societal organization, including individual rights and freedoms, and define government structure and enforcement mechanisms (Alston et al. 2018, p. 14). The second method through which constitutional open access societies control violence is though deterrence mechanisms – that is enforcement by the State through institutions or organisational forms such as the executive and judicial branches of government (North *et al.* 2009[a], p. 61; North *et al.* 2006, pp. 41-42).

OAOs also make impersonal exchange possible in all spheres of life (North *et al.* 2007, p. 26). Within an OAO, the State is said to have no powers to control the allocation and content of economic interests, neither can it manipulate the economy (e.g., through rent seeking), to preserve its political advantage (North *et al.* 2011, p. 10). Powerful political networks lose their influence over the day to day running of the economy, or access to individual rights and privileges; instead, meritocracy is promoted as the ideal.

With this paradigm shift, ordinary citizens can access resources or rights through progressively democratic processes, while organisations become "perpetually lived", that is, they exist in perpetuity, independent of the lives of their members (North *et al.* 2009[a], pp. 56, 62). Public goods and polices are delivered and wealth redistributed to citizens on an impersonal basis (North *et al.* 2009[a], p. 65). This is in contrast to natural states (LAOs), where public goods, such as justice, are typically used as leverage by corrupt elites to manipulate and threaten citizens into taking desired action, such as voting for their political parties (North *et al.* 2009[a], p. 65). In natural states, voters are therefore incentivized to commoditize votes in exchange for cash or other benefits (North *et al.* 2009[a], p. 56).

Another important feature of OAOs which is consistent with the aforementioned enhanced access to rights and resources for ordinary citizens, is the bottom-up approach to the development and enforcement of social policy. Barendrecht (2009) argues that rather than follow the top-down[32] approaches of enforcing justice policies typical of LAOs that have not been successful in many cases, bottom-up approaches which focus on the justice needs of clients should be pursued, as they result in affordable (accessible) and sustainable justice services for the client (Barendrecht 2009, pp. 5, 51). Barendrecht further argues that such smart policies can be facilitated through readily available "basic technologies" that could lead to further innovation, including internet-based services (Barendrecht 2009, p. 51). This concept of client-led policies has taken hold in many jurisdictions, including Kenya, as will be seen in Chapter Five, as public participation in policy-making has been streamlined into the institutional framework.

One may therefore conclude that a society has matured into an OAO when: (i) entry to all forms of organisation (economic, political, social etc.) is accessible to all citizens, (ii) the State does not unduly interfere with, capture or expropriate the foregoing organisational or institutional forms, and (iii) rule of law is imposed without favour to all citizens (North *et al.* 2007, p. 17).

[32] That is, where government legislates, appoints officials and enforces the policies on the pubic, often without their participation in the process.

In sum, institutions are the key means by which OAOs address the high transaction costs associated with the threat of violence or societal anarchy, and coordinate their action.

2.4 Constitutional Moments as Catalysts of Institutional Transformation

Alston *et al.,* (2018) provide deeper insight into how institutional transformation may be accelerated through "constitutional moments" ─ an explanation which resonates with the experience of political and judicial transformation in Kenya. They explain that institutions exist within the context of core beliefs as to how the institutions affect economic and political outcomes (Alston *et al.* 2018, p. 20). In the case of natural state institutions, the belief system is one ultimately geared towards the protection of the interests of elites against external forces. Alston *et al.,* further explain that the core beliefs of elites are often immutable, and only change though political or socio-economic shocks, or the expectation of downstream crisis by leaders (Alston *et al.* 2018, pp. 20-21). The opportunity for transformational change therefore occurs in such situations, when actual outcomes diverge from those initially anticipated – often through shocks to the *status quo* that result in "constitutional moments" (Alston *et al.* 2018, pp. 21-22). During constitutional moments the elites revamp institutions, that is the rules that govern interaction between political and economic organisations (Alston *et al.* 2018, p. 22).

One may argue that Kenya's history is littered with numerous reinforcing constitutional moments, characterized by both sporadic and organized uprisings against the governing political class, which culminated in the Post-Election Violence (PEV) of 2007/8.[33] The constitutional process that ensued as a result of the PEV, resulted in a literal constitutional moment in Kenya with the promulgation of the 2010 Constitution that reconstituted Kenya's governance structures – including the Judiciary (Alston *et al.* 2018, pp. 261-27; Gainer 2015; Lumumba and Franceschi 2011, pp. 30-49).

It is apparent from the foregoing discussion that the judiciary is a feature of an OAO. However, it should be noted that just as rising incomes or economic dominance, are not, by themselves indicative of a society's transformation from a LAO to an OAO, neither is the transplanting of OAO institutional forms such as constitutions, electoral processes, the judiciary, and policies into LAOs (North *et al.* 2011, pp. 3-4; North *et al.* 2007, p. 31).

[33] See international news coverage here:
https://web.archive.org/web/20080220193929/http://english.aljazeera net [Accessed 25 January 2020]

LAO judiciaries are reported to operate very differently from OAO judiciaries (North *et al.* 2011, p. 28). In LAOs, the administration of justice, and the adjudication of rights and obligations is determined by one's networks and personal connections to the judicial system, rather than on the merits of the case (North *et al.* 2007, p. 28). This means that the judicial system in LAOs exists to serve the interests of the elite and is corruptible by non-elites (North *et al.* 2007, p. 28; North *et al.* 2011). Many elites in LAOs who have been educated in OAOs, have attempted to borrow and implement in their home countries the OAO institutional models they observed in the diaspora, with adverse consequences (North *et al.* 2011, p. 12). North *et al.* caution that transplanting institutions or elements of an OAO such as competition, markets, or democracy into a LAO, could run the risk of their capture by the elites, and in so doing entrench the elites' dominance and attendant inequalities, or conversely would undercut the rents that prevent violence in LAOs (North *et al.* 2011, p. 4; North *et al.* 2007, p. 5). In fact, many modern LAOs appear to support many of the institutional forms present in OAOs, the key difference being that LAO institutional forms operate under a LAO logic, that is, rent creation for the elites through corrupt patron-client networks, and suppression of competition (North *et al.* 2011, p. 8-10; North *et al.* 2006, p. 35). The result is that institutional forms in LAOs work differently than those in OAOs (North *et al.* 2007, pp. 25-26).

North *et al.* therefore prefer that OAO institutional reforms are only considered for mature LAOs that have attained the door-step conditions that allow for the impersonal exchange that's characteristic of OAOs, that is: *"(i) rule of law for elites, (ii) support for perpetually lived organisations and (iii) centralized and consolidated control of violence"* (North *et al.* 2011, p. 16; North *et al.* 2007, p. 21; North *et al.* 2006, p. 51). Underpinning these doorstep conditions, and in particular the first two is the necessity of a robust legal and judicial system (North *et al.* 2006, pp. 53-55).

The role of the Kenya's Judiciary in leading institutional transformation is returned to in Section 2.9, for now we examine the role of technology in this transformational process. The section to follow explores the possibility of a technology-led solution to some of the residual challenges, which remain in delivering the promise of a properly-so-called open access society.

2.5 The Role of Technology in The Transition from LAOs to OAOs

In his later works with Wallis and Weingast, North acknowledges that the rapid development of technology has been the most disruptive force of the last two centuries – but states that this growth has not necessarily resulted in transition of LAOs into OAOs (North *et al.* 2011, p. 14;

North *et al.* 2007, pp. 35-36). North *et al.,* note that while technology has enabled some nations to advance their economies by increasing productivity or entrenching their military might, this growth does not always translate into, and may in fact impede, the development of underlying institutional structures into the arrangements that allow for OAOs (North *et al.* 2011, p. 14; North *et al.* 2007, pp. 35-36). They argue that LAO elites can adopt technology selectively, without facilitating the organisational maturity needed for the development of home-grown technology (North *et al.* 2011, p. 14). This is because easing access to the organisational forms that enable local technological solutions would threaten the dominance of the incumbent elite class (North *et al.* 2011, p. 14).

These authors however appear to make an exception for communication technology which they note facilitates the forming and sustaining of organizations, factors which are critical to a society's transition from LAO to OAO status (North *et al.* 2007, p. 36). Communication technology enables populations to not only obtain information on apparent solutions to the developmental challenges they may be facing, but also allows for the harnessing and coordination of action towards this goal (North *et al.* 2007, pp. 36-38). In this regard, the internet and social media have proven to be even more potent than State-controlled or independent mainstream media. The events culminating in the Arab Spring are testament to the power of images, transmitted in real time, to a global audience through mass communication channels, in galvanizing action by independent actors across nations (Mitchell *et al.* 2012). Communication technology can in this way be used to undermine State control, as was the case of the Arab Spring, which permanently changed the political landscape of some Arab and African nations, and still more subtly in others (North *et al.* 2007, pp. 36-38). Technology, and in particular communication technology, can therefore be instrumental in enabling collective action in a manner that goes around the logjam created by the single point of failure, or inertia, within government hierarchies (Noveck 2010, p. 53).

It is important to note that the argument being made here is not that communication technology invariably results in progressive changes with respect to societal transformation to OAOs. Recent developments related to alleged Russian interference in the 2016 USA election demonstrated that media, including social media, can be a destructive force, if co-opted by an ill-intentioned national or foreign state to serve their economic or political ends (BBC 2018). In fact, Treré points out that the techno-optimistic trend tends to overlook the different ways in which governments have used digital technology to surveil citizens and undermine their efforts to hold them accountable (Treré 2016, p. 129). He examines Mexico's resistance movement and the 2012 Mexican elections where *bots* and *ectivists* were widely used to influence

elections by algorithmically manufacturing consent, surveilling citizens, and undermining dissent on social media (Treré 2016, p. 129). Treré writes that in Mexico, digital platforms became sites of, "authoritarian engineering" through the premeditated and artificial construction of consent (Treré 2016, p. 130). Real citizen voices were muffled, and in their place the noise of manufactured, engineered or 'hired voices' of swathes of false followers were elevated to distort or manipulate public opinion (Treré 2016, p. 131). Casonato (2021) refers to the state of affairs resulting from the uncontrolled use of Artificial Intelligence (AI) to generate information and political propaganda as a "model of bubble democracy", consisting of polarized echo-chambers where voters and citizens consider their ideas to be the only legitimate ones (Casonato 2021, p. 132).[34]

Nevertheless, social media has been particularly effective in harnessing political action due to its relative low cost, speed, and wide distribution. The low cost ensures that the technology is widely accessible to populations irrespective of their economic or other status. The speed of information transmission ensures that information is quickly accessible to a wide range of persons during pivotal "constitutional moments". Finally, the wide-distribution of the technology enables a decentralized model of information sharing with fewer filters to either censor or validate the information shared. In sum, these factors make social media, and the internet, amenable to and conducive for an open access paradigm, notwithstanding the issues of interference noted above. Social media is perceived by the larger public as a medium which facilitates transparency as information can be shared widely as soon as it is made available, bypassing State censorship. Social media platforms are also viewed as tools for citizen empowerment and coordination, as each citizen can have a voice in transformational change.

Proponents for the web 2.0 revolution in government insist that opening government should not only entail technological adoption on one hand, or making information available on the other, but should entail provision of tools which enable the public to meaningfully interact with, and interrogate the information provided (Bass and Moulton 2010, pp. 294, 300).

These technological developments therefore beg the question: what role does technology play towards "opening governance" and "opening justice", towards LAO-to-OAO transformation?

The role of technology in catalyzing institutional transformation and lowering transaction costs is best described by Nick Szabo[35]:

[34] Casonato (2021) finds – as will be explored further in Chapter Six – that the way to remedy this imbalance, and create a truly pluralistic democracy is to adopt the principles of constitutionalism in the development of human-centered AI (digital constitutionalism).
[35] A leading cryptographer and scholar.

> *"If we started from scratch, using reason and experience, it could take many centuries to redevelop sophisticated ideas like contract law and property rights that make the modern market work. But the digital revolution challenges us to develop new institutions in a much shorter period of time. By extracting from our current laws, procedures, and theories those principles which remain applicable in cyberspace, we can retain much of this deep tradition, and greatly shorten the time needed to develop useful digital institutions."* (Szabo 1997)

Szabo finds that computers bring about this transformation by running algorithms which enable faster transmission of complex messages through networks at much lower costs (Szabo 1997). He adds that smart contracts in particular (which have become a key element of blockchain technology in industry as discussed later), reduce the "mental and computational transaction costs" imposed by the contractual environment, as they facilitate the different contractual phases of *"search, negotiation, commitment, performance and adjudication"* (Szabo 1997). According to Szabo these elements provide a pathway towards the formalization and creation of more secure digital (contractual) relationships compared to analog paper-based methods (Szabo 1997).

The section that follows examines the policy discourse on open governance and the proposition that governments ought to act as a platforms rather than hierarchies. The growing movement against Coasean models of political coordination through hierarchies in favour of a new paradigm of lateral forms of governance, aided by open source technology shall be examined in this section.

2.6 Government as a Platform, Government 2.0 and the Coasean Collapse

The recent debate around Government 2.0 is based on the reconceptualization of "government as a platform" (O'Reilly 2010, p. 12). This conversation both expands upon and forms part of the general discourse on open government. It therefore builds on the logic of the OAO. This is because "government as a platform" describes a proposed future where government at its core, and aided by the right technologies, acts as a mechanism for collective action (O'Reilly 2010, pp. 11-12). More specifically, government as a platform deploys interactive Web 2.0 fundamentals[36] and *e-government,*[37] and is fueled by the concept of "open innovation", and the collaborative technologies that underpin it (O'Reilly 2010, p. 12; Lluis de la Rosa *et al.* 2017*,*

[36] Upon which social networking applications are built.
[37] See more on e-government here: https://en.wikipedia.org/wiki/E-government [Accessed 13 February 2021]

p. 11). Lluis de la Rosa *et al.* note that open innovation refers to a distributed innovation process that entails the management of knowledge flows across organisational boundaries, and beyond, such as the collaborative innovation involved in open source software development (Lluis de la Rosa *et al.* 2017*,* p. 11). Open source platforms allow for greater citizen participation through the development of apps among other innovative solutions.

Government 2.0 therefore refers to government policies that harness a form of participatory government through collaborative technologies, where in the words of the former US president Thomas Jefferson;

> *"…every man …feels that he is a participator in the government of affairs, not merely at an election one day in the year, but everyday"* (O'Reilly 2010, p. 12; Karanja 2018, p. 5).

Government as a platform therefore goes beyond the idea of "public participation" via a direct democracy, that is, where the minority have their say, and the majority have their way (Noveck 2010, p. 59). It also goes beyond the idea of deliberative democracy which seeks to improve institutional decision-making through widespread public expression and engagement (Noveck 2010, p. 59). Rather, the goal of Government 2.0 is to fashion a collaborative democracy with a view of public and institutional participation that goes beyond votes and deliberations, and in which the public is involved at all stages of the decision-making process and in finding, or better still, innovating solutions to everyday problems (Noveck 2010, pp. 62-63). Government 2.0 has also been referred to as, *"putting government in the hands of the citizens"* by making data available to them (Harper 2013).

Donald Kettl also makes the distinction between Government 1.0 and 2.0 respectively, as the difference between the "vending machine government" and government as the "manager of a market place or bazaar" (O'Reilly 2010, p. 13; Karanja 2018, pp. 5-6). With respect to the former, citizens pay their taxes and expect services (O'Reilly 2010, p. 13; Karanja 2018, pp. 5-6). Their participation is limited to collective complaint when the government fails in its commitment (O'Reilly 2010, p. 13; Karanja 2018, pp. 5-6). As with the vending machine, services are determined before-hand, and are supplied by a handful of selected vendors resulting in a higher cost for the services (O'Reilly 2010, p. 13; Karanja 2018, pp. 5-6). With respect to the bazaar (open innovation) analogy, the community directly exchanges the goods and services and innovates (O'Reilly 2010, p. 13; Karanja 2018, pp. 5-6).

However, a collaborative governance model does not suggest the disappearance of a 'government entity', rather it suggests a restructuring of government to ensure wider

participation in decision-making (Eaves 2010, p. 141). The idea of technologically enabled participatory government is not new. It has been aspirational for many world leaders such as former US President Barack Obama, who once stated:

> "*We must use all available technologies and methods to open up the federal government, creating a new level of transparency to change the way business is conducted in Washington, and giving Americans the chance to participate in government deliberations and decision-making in ways that were not possible only a few years ago."* (O'Reilly 2010, p. 12; Karanja 2018, p. 5)

The foregoing discussion therefore establishes that Government 2.0 is a government that is open with room for collaborative participation. Technology appears to be a key enabler of this new paradigm of governance. It is however important to note that the idea of "openness" or the degree of participation is one that is relative, and may imply different outcomes for different communities, contexts, or areas of governance (Eaves 2010, p. 145). This thesis adopts a flexible approach in this regard and takes into consideration the fact that openness in the context of the judicial system, may vary vastly from openness in the context of security agencies. What is clear however is that Government 2.0 is one that has made the structural and cultural shift from an analog hierarchical structure, to a *digital network structure* (Eaves 2010, p. 140). Eaves refers to this process as the "Coasean collapse" (Eaves 2010, p. 140). He suggests that this collapse occurs when centralized and hierarchical, risk averse, closed (limited access) models of government, are rendered redundant in managing the high transactions costs previously associated with the coordination of government action (Eaves 2010, p. 141).

According to Eaves, the Coasean collapse must begin with breaking the silo mentality within government by accelerating rather than preventing the capacity of public servants to self-organize, that is, to connect and assess with whom to connect (Eaves 2010, p. 146). Only then can this network be extended to the public (Eaves 2010, p. 147). The focus of government under this model of governance would shift from the need to control information, and in its place a new set of skills would become valuable, that is, the ability to partner, convene, engage stakeholders, analyse and act creatively (Eaves 2010, p. 150).[38] Open platforms in particular

[38] Eaves (2010) further suggests that along with the Coasean collapse, three other factors facilitate the emergence of Government 2.0, by shaping not only how government operates, but also how it interacts with the citizens. The first of these other factors, is the 'long tail of public policy', a concept which presupposes that the public is engaged in policy-making on issues that matter to them. Secondly, patch culture — a phenomenon peculiar to open source computing where coders can independently "patch" bugs or engineering errors on platforms. Lastly, the replacement of the need for objectivity with greater transparency and open data.

have proven to be very useful in this regard as they lower barriers to entry and therefore spur innovation and widen participation (O'Reilly 2010, p. 15).

By way of illustration, each progressive iteration or model of computing which has thrived, has moved further towards advancing individual participation in the digital sphere. In this regard, the publication of the specifications of the Personal Computer (PC) by IBM, led to the liberation of the computing industry from IBM control, as anyone could build their PC using off the shelf parts (O'Reilly 2010, p. 15; Karanja 2018, p. 6).[39] In making greater in-roads to even wider user participation, Microsoft became the foremost software development platform for independent software developers, who could now add value to PCs through the standardized APIs of MS-DOS and eventually Microsoft's Windows (O'Reilly 2010, p. 15). This was until they abused their market dominance by favouring their own applications (O'Reilly 2010, p. 15). Apple has also advanced the cellphone "bazaar model" through its iPhone developer platform for smartphone applications (apps), which again allows for wider participation in the creation of smartphone apps (O'Reilly 2010, p. 16; Karanja 2018, p. 6). Prior to Apple only cell phone providers could 'vend' cell phone applications. Another factor fueling this movement towards wider participation, and decentralized innovation was the ascendance of a powerful open platform – the Internet and the World Wide Web founded on a radically decentralized model (O'Reilly 2010, p. 16).

The computing illustration demonstrates that in fact open systems can become closed over time and may limit participation (as did Microsoft), which ultimately results in the loss of their innovative edge (O'Reilly 2010, p. 18). O'Reilly points out that even with the Government 2.0 models which facilitate an ecosystem for participation and collaboration, programmes designed to bootstrap a new market e.g., those used in policy-making or implementation, can get in the way of Schumpeterian creative destruction (O'Reilly 2010, p. 18). He therefore recommends that much thought is given to how to deal with programmes that no longer work within the Government 2.0 paradigm, that is, those that only advance the government's reach or control, rather than the needs of the citizens and economy (O'Reilly 2010, p. 17).

It is therefore clear that at least in the private sector, embracing of open standards has been key to innovation, through lowering barriers to entry by destroying the stranglehold of single-player dominance (O'Reilly 2010, p. 17). Chapter Six of this thesis examines the promise held by blockchain (founded on a decentralized infrastructure, and open data standards) in mitigating

[39] This development lowered barriers to entry so that university students could effectively participate in the industry through their dorm room innovations. Some of the most prominent of these students who went on to start multibillion technological ventures were Michael Dell, Bill Gates and Mark Zuckerberg.

these costs, and as a tool for open, collaborative or participatory governance in Kenya's criminal justice sector (Lluis de la Rosa *et al.* 2017, p. 14). Ahead of that discussion however, the section below further elaborates on the concept of open data standards and their role in facilitating Government 2.0 and the Coasean collapse.

2.7 Open Data Standards as the Foundation for Government 2.0

Data standards are the rules by which organisations store data, including the data's format (Colarusso and Rickard 2017, p. 390). Data standards are 'open' when the system protocols in question allow users to share data freely and independently between competing vendors, thus enhancing interoperability and utility between digital systems (Colarusso and Rickard 2017, p. 393; Miglarese 2019).

Open data is a concept distinct from open data standards and refers to, *"data that can be accessed and shared by the general public freely and with ease"* (Colarusso and Rickard 2017, p. 393). Open data standards are ultimately about the use of file formats and protocols that ensure interoperability and future readability of data by different software programs (Fioretti 2010, pp. 366-367). For this reason, file formats and protocols are deemed to be more important than software programs (including open source software), as the latter are rendered useless if the file formats and protocols remain independent, or do not allow the different software programs to "speak to one another" (Fioretti 2010, pp. 369, 371).

Colarusso and Ricardo argue the open data standards are the catalysts or foundational elements, that would leverage technology's capacity to drive disruptive reforms in the justice sector (Colarusso and Rickard 2017, p. 393). Open data standards are helpful in several ways within the context of justice. Firstly, open data standards address themselves to 'form' that is, the way the said data is presented, which is equally important as the substance of justice, as it contributes to the clarity and efficiency of the judicial process (Colarusso and Rickard 2017, pp. 389, 393). In this regard, content or substance made visible can be made more easily accessible, which in turn enhances transparency.[40]

Secondly, open data standards allow for the rapid adoption or scaling of digital solutions e.g., for referring to case law emerging from the different courts, at a low cost to the State and court users (Colarusso and Rickard 2017, p. 390). With open data standards, different applications,

[40] See National Centre for State Courts (NCSC, USA) website: https://www ncsc.org/services-and-experts/areas-of-expertise/court-statistics/national-open-court-data-standards-nods [Accessed 5 January 2020]

from different vendors can be integrated and work seamlessly as they use the 'same language' to interpret and present data outputs (Colarusso and Rickard 2017, p. 390).

In this regard, the USA's National Centre for State Courts (NCSC) note that the National Open Court Data Standards (NODS) allow for consistent interpretation of data, as well as meaningful comparison between different datasets.[41] The traffic navigation or 'Maps' services enabled by the General Transit Feed Specification (GTFS) open standard, [42] has been able to rapidly scale to numerous transit systems in cities around the world, as they all rely on the same standard for data sharing (Colarusso and Rickard 2017, p. 394). It has been noted that implementing open data in the management of traffic in Europe has saved the continent 629 million hours of unnecessary waiting time, reduced traffic accidents by 5.5%, generated 25000 jobs and saved the government approximately 1.7 billion EUR (Truong *et al.* 2019, p. 527).[43]

Thirdly, and related to the foregoing point, open data standards reduce the cost of technological adoption for the State (Colarusso and Rickard 2017, p. 387). This is because the burden of comprehensive innovation is lifted from the State, and in the present case the justice system, and shared with other stakeholders wishing to interact with the criminal justice system (Colarusso and Rickard 2017, pp. 395, 397-398, 410). In the GTFS example above, TriMet, which is Portland Oregon's public transit organization, is said not to have born any direct financial costs for adapting Portland's transit data to the GTFS standard (Colarusso and Rickard 2017, p. 394). The NCSC similarly noted this to be a benefit of NODS.[44]

Fourthly, open data standards prevent vendor lock-in or the entrenchment of monopolies over the information sharing process (Colarusso and Rickard 2017, p. 390). Open data standards do away with the need for retaining a single vendor for multiple solutions to ensure that each product can read the data (Colarusso and Rickard 2017, p. 392). In fact Fioretti argues that:

> *"standards are meant to ensure that data can be accessed in a variety of ways so that no single program or software vendor is indispensable"* (Fioretti 2010, p. 369).

Therefore, with this model there is need for the same brand of tools or a unique service provider (Colarusso and Rickard 2017, p. 391).

Fifthly, with open data standards there is no need to compromise privacy and control over data with the disclosure of data. In this respect, single data entry points and Application

[41] NCSC, Supra.
[42] Created by Google in collaboration with TriMet.
[43] See information on the European Data Portal: https://www.europeandataportal.eu/en/training/what-open-data [Accessed 21 March 2021]
[44] NCSC, Supra.

Programming Interfaces (APIs) have been used by institutions to facilitate the publication of information while ensuring the integrity and privacy of client or institutional data (Colarusso and Rickard 2017, pp. 392-393). The single data entry point ensures secure sharing of information while the APIs facilitate this exchange by providing an interface that connects with different computer programs (Colarusso and Rickard 2017, p. 392).

The National Information Exchange Model (NIEM) is an open standard used by state, federal and judicial authorities in the United States to share sensitive information and facilitate e-filing of criminal complaints (Colarusso and Rickard 2017, pp. 393-396, 410).

Sixthly, Fioretti notes that open standards allow users to evaluate the different software programs on their various strengths and weakness according to their needs, such as: performance, flexibility, ease of customization and the quality of the outputs e.g., documents (Fioretti 2010, p. 371).

Ultimately and most importantly however, open data standards facilitate low, and moderate, income groups to access justice and drive system change (Colarusso and Rickard 2017, pp. 388, 390). It is paramount that all court users who are important stakeholders in the transparency agenda, have access to justice. This is especially true for low, and moderate, income individuals, and vulnerable children in conflict with the law who often find themselves falling within the justice gap bracket due to the high cost of access to justice (Colarusso and Rickard 2017, p. 399). Open standards can circumvent this cost while still enabling the provision of legal assistance without the need to access full legal representation (Colarusso and Rickard 2017, p. 399). This assistance can be provided through self-help tools made available to the public, which may commence with an interview process and result in an e-filing (Colarusso and Rickard 2017, pp. 400-401).

The consummate impact of open standards therefore, would be firstly to, dramatically impact access to justice for marginalized groups but also, secondly, to create a transformation of court operations (Colarusso and Rickard 2017, p. 402). These transformations should ideally translate to the decentralization of the centers of ‘corruptible’ power within the justice system, the breaking down of silos within the justice system by enhancing inter-agency coordination and case management, enhancing efficiency and transparency, and the reorientation of the judicial processes to the needs of court users, rather than to the bureaucratic requirements of the more dominant entities such as the Judiciary and courts (Colarusso and Rickard 2017, pp. 402-403).

The section that follows examines the concepts of e-justice and open justice, and some of the considerations and risks to be taken into account in the adoption of e-justice systems. The section also serves as an anchor and outlines the connections between; the theoretical foundation presented in this Chapter, the discussion on "values" in Chapter Three, the research analysis and baseline findings on Kenya discussed in Chapter Five, and the application of blockchain in case management discussed in Chapter Six.

2.8 Exploring e-Justice as Open Justice

Sandoval-Almazan and Gil-Garcia write that with the advent of the Internet, judiciaries have been forced to embrace electronic justice (e-justice) to "open its processes and data" (Sandoval-Almazan and Gil-Garcia, 2020 p. 335). They note that the term "e-justice" has since evolved to "open justice" to denote the progression from simply using ICT to improve processes and stakeholder relationships, towards the broader goals of fostering openness, that is, transparency, participation and collaboration within the justice system (Sandoval-Almazan and Gil-Garcia, 2020 p. 335).

In the context of justice and the courts, Susskind (2019) distinguishes between technologies that are merely *"automative,"* or that *"improve, refine, streamline, optimize and turbo-charge our traditional ways of working"*, and those that *"displace and revolutionize conventional working habits"*, or that are *"transformative"* (Susskind 2019, p. 34).

Stakeholders in Kenya's justice system have stated[45] that the primary goals for the adoption of e-justice in Kenya, such as automated case management systems has been to; facilitate access to justice and the removal of access to court barriers, enhance accountability in decision making, enhance transparency, enhance efficiency including in the reduction of case backlogs, enhance interagency collaboration or participation and reduce corruption (UNODC 2022). This thesis seeks to understand how the automation of case management processes can be made even more transformative through the implementation of blockchain technology to enhance the governance, and implementation of OAO values in this space (Susskind 2019, pp. 38-39).

Jneid *et al.,* find that though the United Nations has stated that ICT ought to be used as a path towards the attainment of the 2030 Sustainable Development Goals (SDGs), research indicates the e-government[46] (and therefore e-justice solutions) have been most successful in nations with strong institutions (Jneid *et al.* 2019, p. 1; Sandoval-Almazan and Gil-Garcia, 2020 p.

[45] During proceedings at the *"National Council on the Administration of Justice (NCAJ) Hybrid Conference on the Automation of Criminal Cases"* held on 8 February 2022.

[46] Government's use of ICT, especially the Internet to provide services and policies.

335). This position is consistent with the observation in the forgoing section that OAO institutional forms, ought to be considered only for mature LAOs that have attained the door-step conditions necessary for the attainment of OAO status. It will also be seen in Chapter Six that the implementation of blockchain in the justice system should only be considered for mature LAOs with fairly well establish regulatory and institutional frameworks, to avoid its capture and abuse by the State or governing elite.

Therefore, successful adoption of e-justice is predicated on an existing framework of strong institutions within a regulatory context based on open access "values". At a recently concluded conference (2022), to take stock of the status of automation in Kenya's justice sector and learn from the successes of Rwanda, the Chief Justice of Rwanda[47] noted that,

> *"judicial values are crucial determinants of the quality of justice, and adoption of e-justice should thus depend on how it affects these values and ultimately the performance of institutional mandates"* (UNODC 2022).

Jneid *et al.* further find that the quality of these institutions can be measured by governance indicators such as: (i) voice and responsibility, (ii) political stability and the absence of violence, (ii) government effectiveness, (iii) regulatory control and (iv) the control of corruption (Jneid *et al.* 2019, p. 1). They also note that the development of e-justice can be measured by the availability of; efficient hardware, security and network components, direct assistance information systems for judges and other court staff e.g., case law portals, court administration and case management information systems, systems for communication between courts, organisation and governance of information systems e.g. data protection and a legislative framework underpinning the use of information technology (Jneid *et al.* 2019, p. 3). It will be seen in Chapter Five that the lack of many of these base infrastructural requirements remain a major impediment to the successful adoption of e-justice systems in Kenya (UNODC 2022).

Jneid *et al.,* further note the following cutting-edge trends in technology progressively making their way into the administration of justice: (i) predictive justice and artificial intelligence (AI); (ii) 3D visualization devices; (iii) blockchain technology and (iv) sustainable development by running innovation processes by performance (Jneid *et al.* 2019, p. 3). They argue that the goal of adopting these among other e-justice solutions should be to improve access to justice and enhance efficiency for the users, who use them to obtain information and complete a judicial service (Jneid *et al.* 2019, p. 3).

The discussion in Chapter Six will explore the transformative potential of adopting blockchain technology to enhance interagency case management in Kenya's justice sector. It shall examine

[47] Hon. Justice Dr. Faustin Ntezilyayo

how values intersect with the technology, to strengthen case management systems, therefore bring the administration of justice closer to the OAO ideals.

It is however important to note that while e-justice is an important component for facilitating open justice, there are risk factors to such adoption that ought to be considered (discussed in greater depth in Chapters Five and Six). Rosa *et al*., identify some of these risk factors as; the absence of the infrastructure described above, capacity issues such as communication, inadequate coordination between implementing entities, inadequate performance and quality review frameworks and the lack of checks to ensure that e-government does not obstruct responsiveness or reduce the responsibility of duty bearers (Rosa *et al.* 2013, p. 247).

Velicogna notes that these risks are exacerbated with the involvement of third-party service providers to fill the local knowledge gap, particularly in adopting smart or cutting-edge e-justice solutions such as blockchain (Velicogna 2017). Velicogna finds that while the engagement of third-party developers may serve the goals of open justice, they may also result in compromising institutional values and the destabilization of consolidated practices – a consideration that will be explored in greater depth, in Chapter Six of this thesis (Velicogna 2017, p. 14).

2.9 Open Government Partnership and the Kenyan Judiciary ICT Strategy

This section now turns to Kenya's, and in particular the Judiciary's experience with the open data movement. The goal of this discussion is to explore some of the cultural and operational considerations that come into play in institutional change and technological adoption.

Kenya joined the multi-country initiative — the Open Government Partnership (OGP) and its campaign to promote transparency, accountability and integrity in government, in 2011 (Gainer 2015, pp. 6-8). The integration of technology to speed up court processes was included by the Ministry of ICT,[48] as one of Kenya's key components in its action plan towards judicial reform. (Gainer 2015, pp. 6-8).

The ICT Authority however reported that entrenching the use of technology in the Judiciary proved challenging (Gainer 2015, p. 7). This was firstly due to the lack of infrastructure and unstandardized procedures which made system implementation difficult, but more importantly due to the lack of support from judicial officers and other staff who resisted and even sabotaged efforts to introduce case management and audio-visual recording systems (Gainer 2015, p. 7).

[48] Which was spearheading Kenya's open data initiative.

The Ministry's then Permanent Secretary, Mr. Bitange Ndemo conceded that the lack of broad sectoral participation – including by the Judiciary in developing the OGP commitment – eventually undercut the initiative (Gainer 2015, p. 7). In his words:

> *"Telling judges the initiative was an OGP commitment doesn't work, … If they don't want it, they don't want it."* (Gainer 2015, p. 7).

Support from the Judiciary, including the judicial officers at all levels of services and supporting staff, was therefore seen as a crucial step for the success of the transformation agenda, particularly with regards to the adoption of technology (Gainer 2015, p. 8).

The key protagonist in the Judiciary's transformation agenda, then Chief Justice (CJ) Willy Mutunga, and his transformation team therefore set out to build consensus based on participation by all actors in the Judiciary, to ensure that they took ownership of the reform process (Gainer 2015, pp. 8, 11, 12). These efforts, along with the improvement of the terms of service of all staff, the removal of hierarchical barriers and symbols of hierarchy, such as the wigs inherited from the colonial institution, as well as a widely published vetting procedure helped secure the internal support for the reforms (Gainer 2015, pp. 8-9). According to the CJ, the idea of collective leadership was paramount to securing buy-in from internal stakeholders (Gainer 2015, p.17). It is also apparent, that the incumbent CJ Justice Willy Mutunga, played a pivotal role in galvanizing support for these reforms (Gainer 2015, p.17).

The Judiciary of Kenya therefore set out its first plan for transforming the sector in the Judiciary Transformation Framework (JTF), latterly succeeded by the Sustaining Judiciary Transformation (SJT) framework. The fourth pillar of the transformation agenda in the JTF was "*harnessing technology as an enabler of justice"* (Judiciary of Kenya 2012, p. 19). The JTF saw this fourth pillar as indispensable in achieving all its other stated objectives and Key Result Areas (KRAs). The Judiciary further identified the lack of an adequate ICT infrastructure as an impediment to service delivery (Judiciary of Kenya 2017, p. 45). In 2017, the Judiciary therefore adopted a robust ICT strategy laying out in its ICT Policy and ICT Master Plan (2018-2022). It was anticipated that technological adoption, and e-justice will not only expedite the delivery of justice but would also engender transparency and public trust in the institution (Judiciary of Kenya 2012, pp. 14, 19).

The SJT which followed the JTF however states that the technologies adopted prior to, and as a result of the JTF had not translated into successes, though lessons had been learnt to inform the ICT strategy moving forward (Judiciary of Kenya 2017, p. 45). Ostrom writes that the mixed gains in technological adoption, are more widespread than one might expect (Ostrom

2010, pp. i-ii). He states that contrary to popular belief, technology does not save the courts, though it is a tool that has great utility as a scaling solution (Ostrom 2010, pp. i-ii). He argues that a key reason that technology has failed to meet its objectives has been because of the policy makers and technologists' failure to pay sufficient attention to existing processes and work culture.

In the High Performance Framework for Courts, Ostrom advises implementers not to "pave the cow paths" (Ostrom 2010, pp. i-ii). He argues that any uptake in technology must be preceded by a careful consideration of how processes and work flow should be redesigned for more efficient and just outcomes (Ostrom 2010, pp. i-ii). Ostrom writes the existing culture of judges and managers will impact on the implementation of all policies and procedures, and that the belief that reform can be instantiated by the implementation of any policy at any time is mistaken (Ostrom 2010, p. v). This was best illustrated by the Kenya Judiciary's experience with the implementation of ICT within the wider Government reform and open governance agenda, led by the Ministry of ICT.

This discussion goes to show that the digital communication technologies warrant analytical and nuanced assessment, which takes into account the risks and gaps which currently inhabit the arena of digital politics, including the cultural or operational context. The analysis should encompass a broad and deep interrogation of the objectives of the movement towards the entrenchment of aspirational values such transparency or participation/democracy. The discussion should also distinguish between the values of transparency, accountability, and responsiveness, and critically assess whether any digital move towards transparency equally fosters accountability and responsiveness. This reflection on the apparent "conflict or clash" of values in institutional and technological reform, is undertaken in Chapter Three of this thesis.

2.10 Conclusion

This chapter has mapped out a set of theories which explain how economic and political organization have developed over time. The chapter showed that in the context of political organization, governance systems adopted hierarchical structures which were closely aligned to the needs and interests of the governing elites, as a means of mitigating the constant threat of violence which dominated earlier societies. Over time, these structures progressively specialized to address governance related problems. A key specialization was the judiciary, which was initially created to resolve frictions, particularly around land ownership among the governing elites.

It however emerged that hierarchical organizations created other problems, which became more visible as societies scaled up, principally through the paradigm of the Limited Access Order (LAO) based on exclusion. The preoccupation of societies therefore became transforming LAO societies into more equitable Open Access Order societies (OAOs), where barriers to economic and political participation were significantly reduced.

The discussion also found that with the advent of technological progress, particularly with respect to modern advancements in communication and computing technology, the realization of the OAO based on open governance with enhanced participation, transparency and accountability potentially became a more easily attainable goal. Technology and in particular open digital governance platforms (Government 2.0), would be the mechanism that would ultimately bring about the "Coasean Collapse".

We have also seen from the foregoing discussion that buy-in or ownership by government actors is key to the success of open access or open government programmes and platforms. The foregoing discussion on OAOs and Government 2.0, and the gains to be harnessed from such institutional and societal transformation can only take place in the context of a wider discussion on the role and place of "values" in technological design, particularly within the context of the administration of justice in Kenya. This discussion is undertaken in Chapter Three.

3.0 DESIGNING VALUES IN TECHNOLOGY FOR JUSTICE SECTOR TRANSFORMATION

Values which are enshrined in modern day constitutions among other institutional instruments of governance, are core to societal transformation. This chapter shall demonstrate that the OAO, which this thesis argues is the pinnacle of societal transformation, is a society founded on a bedrock of constitutional values such as; democracy, transparency and accountability. In such societies, values are woven into the institutional and systemic structures, and ultimately into the very life of the societies.

The goal of this chapter is to elaborate on the mechanisms by which values can be integrated or embedded into the Government 2.0 and open government context, where technology plays a key role in governance. Section 3.2 therefore lays out the case for "Value Sensitive Design" (VSD) as one of the approaches towards this stated goal. This approach contrasts with the value neutral thesis. VSD contends that in fact technologies are imbued with values in the design process.

The discussion thereafter shifts to the Kenyan constitutional context in sections 3.4 and 3.5, to examine the national values that would be applicable in a technology-enabled paradigm of governance, while taking into account modern managerial approaches. Section 3.5 tackles the tensions which may exist in designing-in values which may be in conflict or may be in competition, into technology and other institutions of governance. It is ultimately argued that these considerations call for nuanced approach to the adoption of, or design of technology for a given governance context. The section that follows addresses the nexus between technology and values.

3.1 Values and Technology

In recent years there has been a growing discussion on the role of moral values in technological design. Proponents of this thesis are persuaded by their observations of the impact that technical artefacts have had in shaping human behaviour (Kroes and Verbeek 2014, p. 1). In this regard, they have found that the products that we engage with impact on a person's lived experience, which in turn has an impact on the person's ability to meet their aspirations (Davis and Nathan 2015, p. 11). They therefore cast technical artefacts in an active rather than passive role, that is as "moral agents" rather than as "passive instruments" (Kroes and Verbeek 2014,

p. 1). As such, much like human agents, technical artefacts can be subject to a moral qualification or judgement — either good or bad (Kroes and Verbeek 2014, pp. 1, 3).

This approach goes against the grain of the thinking which holds that only agents and their actions can be subject to moral evaluation or judgement, and not their technical inventions (Kroes and Verbeek 2014, p. 3). This development also challenges the thesis that technology is inherently morally neutral – an idea encapsulated in the American National Rifle Association's slogan, "Guns don't kill people, people kill people" (Poel and Kroes 2014, p. 104). According to the Association's members, and others in favour of the "morally neutral" thesis, technical artefacts do not have values embedded within them (Pitt 2014, p. 90). Nevertheless, even where there has been agreement on the thesis that artefacts are "moral agents", the assignment of this agency has varied with different schools of thought such as those which find these values to be: *intrinsic, extrinsic* or *relational, instrumental* or *final* (Poel and Kroes 2014, pp. 105-106).[49]

3.2 The Case for Value Sensitive Design

While the arguments and interpretations underpinning the thesis in favour of moral agency of artefacts are varied, evolving and yet to crystallize, there is a general acceptance of the idea that technical artefacts do have morally significant forms of agency (Kroes and Verbeek 2014, p. 4). This view is centered on the belief that designers of artefacts carry their values into the design process, whether or not they acknowledge and address values in the design process (Freidman 1999, p. 6). It is therefore reasonable that at a minimum, designs will be imbued with and reflect the designer's own values, which are then expressed in the use of these technologies/objects (Freidman 1999, p.6). If we take the design of an online social networking platform and of an e-voting platform, one may see that a value at the heart of both designs is "participation". It can be argued that the creators of these artefacts intend that as many users as possible access and participate on the platforms. However, this "participation" is expressed in different ways and for different reasons. The social media platform is designed with the purpose of allowing users to connect and network with others, while "participation" in the context of e-voting refers to people's ability to exercise their democratic right in decision-

[49] Artefacts with intrinsic value embody within them certain values which remain the same whatever the object's relation to another thing. Another view is that artefacts embody values only in relation to something else, that is relational or extrinsic value. Yet another interpretation is that artefacts have instrumental value which may be exploited towards a morally negative or positive outcomes, which can be contrasted with final value – that is, "value for its own sake".

making. The values of transparency and privacy in both platforms are also designed-in and expressed in different ways. However, this does not mean that the creators of the platforms may also have had other nefarious objectives in creating the platforms, such as social engineering or surveillance, or that their designs may unintentionally result in the same, or similar perverse results.

Importantly, for the purposes of the present research, the acceptance that artefacts at a minimum embody the values of their creators has led to a strong case being made in favor of "Value Sensitive Design" (VSD) in the engineering process (Poel and Kroes 2014, p. 104). In essence this approach, which has been under development since the 1990s, advocates for deliberate steps to be taken to ensure that moral values of ethical importance centered on human well-being, dignity, and justice e.g., trust, accountability, privacy, and consent, (also referred to as human values), are incorporated in a systematic way into the design of technical artefacts (Poel and Kroes 2014, p. 104; Davis and Nathan 2015, pp. 12-14; Freidman 1999, p. 3). More specifically, VSD has been defined as an approach in the design of technology which takes into account human values in a, *"principled and comprehensive manner throughout the design process"* (Freidman 1999, p. 3).

VSD provides a theory, methodology and approach – or strategies and techniques that assist researchers and designers take into account the forgoing considerations in the design, implementation, use and evaluation of interactive systems (Davis and Nathan 2015, p. 14). VSD theory holds that technology's impact on humanity is determined by the features of the design, the context that it is used and the people using it (Davis and Nathan 2015, pp. 15-16). The approach therefore advocates for the identification and addressing of human values impacted by the use of, or interaction with technology, with the objective of enhancing technological design (Davis and Nathan 2015, p. 15). In this regard, VSD literature presents a "tripartite" investigative methodology composed of: (i) conceptual investigations which identify both the direct and indirect stakeholders as well as the values implicated by the use of the technology, and the tensions, conflicts or trade-offs that may arise in the latter case e.g. anonymity vs. trust, (ii) empirical investigations seeking to understand the human context in which the artefact is situated, such as stakeholders' "understanding, contexts and experiences" in relation to the technologies and values concerned e.g. through surveys and questionnaires and (iii) technical investigations such as on how the features of the technology impact, that is, hinder or support certain values (Davis and Nathan 2015, p. 15; Freidman *et al.* 2006, p. 4).

This thesis undertakes a similar approach to understanding how the constitutional values are translated into the current decision-making and implementation frameworks within Kenya's criminal justice system, and the role of technology, including blockchain in this regard.[50] While a plethora of other value-oriented approaches exist,[51] VSD is considered here due to its extensive analytical approach described above, which provides a robust framework for understanding values oriented systems-design in a criminal justice setting. VSD is also considered due to its wide application to human-computer interaction or HCI (Davis and Nathan 2015, p. 12).

Some of the emerging technologies that have come within the purview of this approach have been open source technologies that underpin coordinated participatory, transparent, or democratic processes, as well as those which enable anonymity online in everyday transactions such as email and cash transactions (Freidman 1999, p. 5). For this reason, VSD is especially relevant to the present discussion on blockchain technology, which is itself open-source and incorporates values among other elements amenable to this approach to design.

It should however be noted that values incorporated into a technical artefact, will often be designed to support, if not entrench the values of the institution within which the technology is implemented. This therefore necessitates a discussion on the integration of values into the design of institutions, and in particular, criminal justice institutions. This discussion is undertaken below.

3.3 Values and Institutions in the Open Access Order (OAO)

The discussion in Chapter Two held up the OAO as the ideal, that is, the full realization of societal transformation of democracies characterized by socially just, open access institutions that embody shared belief systems underpinned by equality, sharing and universal inclusion (Ménard 2011, p. 17; North *et al* 2009, p.110). Reference to institutions in this context confines itself to the complex non-market based organisational or social forms that reproduce themselves for the purpose of providing collective goods to a society (Miller 2015, p. 770).

[50] Chapter Five identifies and bases its analysis on the experience of the following broad categories of stakeholders: (i) individual staff members (ii) criminal justice institutions and (iii) members of the public. The values examined through-out the thesis are those stipulated in the 2010 Constitution of Kenya that is, transparency, accountability, democracy and social justice.

[51] Other approaches that have emerged for supporting the incorporation of human values into systems design include: Computer Ethics, Social Informatics, Computer Supported Cooperative Work (CSCW) and Participatory Design.

Collective goods refer to desirable goods (such as justice), produced through the joint activity of institutional actors, which are in principle available or ought to be produced, maintained, and made available to the entire community, which has a joint or institutional moral right to the said goods (Miller 2015, p. 772).

It has been previously stated that LAO institutions exist to fetter access to collective goods in favour of a few privileged elites. This chapter seeks to interrogate how institutions can be designed to allow for transformation of LAOs into OAOs with the foregoing open access characteristics. The discussion also examines the role that values play in the design of OAO institutions and in particular, open access criminal justice institutions.

Only a handful of wealthy nations within the Organisation for Economic Cooperation and Development (OECD)[52] can be said to have attained the status of the OAO (Gray 2015, p. 2; North *et al.* 2011, p. 9). There has been a consensus among these pioneering nations that "openness" is central to effective and good government (Gavelin *et al.* 2009, p. 8). Open government in this context is generally understood to be:

> *"…the transparency of government actions, the accessibility of government services and information and responsiveness of government to new ideas, demands and needs"* (Gavelin *et al.* 2009, p. 8).

Open government therefore refers to a systemic orientation towards the free flow of information to and from government, through multiple channels such as opinion polls, requests for information, complaints, challenges, dialogues, media coverage, websites and other platforms and consultative processes (Gavelin *et al.* 2009, p. 12).

Taken collectively, the values of transparency, accessibility and responsiveness are said to be foundational to improving the evidence base for policy-making, discouraging corruption and in enhancing public trust in government (Gavelin *et al.* 2009, p. 8).[53]

[52] Countries in Western Europe, USA, Canada and Japan.

[53] Within the OECD nations, the foregoing values have informed the adoption of various legal, policy and institutional measures towards the implementation of open government such as; laws on access to information and documents, ombudsman offices, supreme audit institutions, laws on administrative procedures, laws on privacy and data protection, e-government policy, whistle blowing protection policy, public interest disclosure policy, consultation policy and laws on the right to observe meetings held by public agencies. Gavelin writes that among the foregoing reforms those entailing 'access to information' or the 'right to know' have been the most pervasively implemented.

3.4 Constitutional Values and the Kenya Justice System

Kenya stands on firm ground with respect to the legal and policy framework which governs the values underpinning the execution of all public functions. Article 10 of the 2010 Constitution identifies the national values and principles of governance which bind any State organ, State officer or public officer who among other duties, *"makes or implements public policy decisions"*.[54] These Article 10 national values and principles of governance which are the focus of the present discussion are broadly categorized as: (i) transparency, (ii) integrity or accountability, (iii) democracy or participation of the people, and (iv) social justice.

Sustainable development is included as a value in article 10 of the 2010 Constitution, but is not discussed here, as it is perceived more as an outcome of mainstreaming the foregoing values into the fabric of public administration. Transparency and accountability which are clustered together in Article 10, are also discussed here as distinct but highly correlated values.

Article 232 of the 2010 Constitution further outlines the principles of public service which include: (i) responsive, prompt, effective, impartial, and equitable provision of services, (ii) involvement of the people in the process of policy-making, (iii) accountability for administrative acts, and (iv) transparency and provision to the public of timely, accurate information. These values can be seen as the product of a long and sometimes fraught dialogue process that forced the country to confront its historical, and more recent challenges on its path to democratization.

The importance of these core values is further highlighted in Article 132 of the 2010 Constitution which obliges the President of the Republic, to make a yearly report to the nation, on all the measures undertaken and progress made in actualizing these values by national bodies (KNCHR 2016, p. 2).

In 2011, the then Ministry of Justice, National Cohesion and Constitutional Affairs set up a Taskforce mandated to prepare a policy for the operationalization and institutionalization of the national values and principles of governance.[55] The policy provides a framework and strategies for mainstreaming Article 10 values into national programmes and activities, with the goal of ultimately impacting *"the way of life"* of Kenyans (KNCHR 2016, p. 7). One of the ways in which justice sector institutions have placed national values at the forefront of their

[54] Art. 10(1)(c) The Constitution of Kenya, 2010. Available at: http://kenyalaw.org/kl/index.php?id=398 [Accessed 24 August 2020]
[55] Sessional Paper No. 8 of 2013. Available at: https://www.cohesionandvalues.go ke/wp-content/uploads/2016/11/Sessional-Paper-No-8-of-2013-on-National-Values-and-Principles-of-Governance.pdf [Accessed 24 August 2020]

operations has been by instituting them in virtually all their strategic documents and policy instruments. The values are to guide all state organs and public officers in their functions.

This thesis argues that the national or constitutional values ought to be reflected not only in all governance structures and the institutional fabric of the State, including the justice sector. Values should also be considered prior to the adoption of technology in the sector, that is, the extent to which such adoption would impact values such as accountability, transparency, independence and *vice versa*. Susskind (2019) advocates for a similar approach in the adoption of online courts, he states:

> *"…If we can come to agree, more or less, on the principles and values that any court system should embody and the outcomes and benefits that any court system should bring, then we will be better placed to compare current with proposed systems. More, I want to provide a set of criteria against which future developments and recommendations can be assessed."* (Susskind 2019, p. 10)

The Judiciary of Kenya, like all State organs is required to not only embody constitutional values, but also to interpret the Constitution in a manner that upholds them pursuant to Article 259 of the Constitution (NCLR 2010). Article 259(a) requires that the Constitution is, *"interpreted in a manner that promotes its purposes, values and principles."*

The discussion to follow therefore first lays out how these national values have been translated and personalized to the Judiciary's transformation agenda, particularly its transformation goals with respect to the courts. The discussion will specifically determine the extent to which the Judiciary's ICT strategy under the transformation agenda furthers the transformation goals. This discussion will also inform the discussion in Chapter Six on the value proposition of blockchain towards the transformation agenda. In essence, the assessment of the role of both existing and proposed technological interventions in the administration of justice shall be measured with respect to their consistency with the national values expressed above, and the transformation goals, from which they are derived.

It should also be noted from the onset that each organisation within the criminal justice sector outlines its own organisational values. The national values are therefore discussed here as a baseline of the expected value orientation of the sector as whole, which is ultimately derived from the "Grundnorm" or highest law of the land – the Constitution.[56]

[56] The values of the national coordinating body of the criminal justice sector, the National Council on the Administration of Justice (NCAJ), that is, *accountability, constitutionalism, consultation, interdependence, public*

3.5 Value Sensitive Institutional Design in the Context of New Public Management

Colarusso (2017) proposes that courts should be central drivers in the adoption of judicial data standards and by extension, judicial transformation, as they are the arbiters of form and keepers of records (Colarusso and Rickard 2017, pp. 397-398). He elaborates that courts are best placed to leverage coding and legal technology for the benefit of court users, as they codify form in court rules and adopt standards of citation (Colarusso and Rickard 2017, pp. 387, 389). This sentiment is also shown to be true in Kenya as will be discussed in Chapter Five. The Kenyan Judiciary has been the natural pace setter in technological reforms within the justice sector, due to its central adjudicative and oversight role in the formal justice system. Colarusso also argues that courts have a vested interest in the development of judicial data standards which link court data to other datasets, as this would ease the pressure on the courts to be the ultimate resource for all court user needs (Colarusso and Rickard 2017, pp. 397-398). On the other hand, he argues technological adoption is often (in practice) not transformative, but is instead duplicative, non-integrated, and pegged onto existing processes that are often not geared to the needs of the users (Colarusso and Rickard 2017, p. 402). He argues that disruptive technologies must: (i) firstly enable collaboration between courts and other justice partners, (ii) be designed with a user-focus, (iii) and be responsive to the need for change where supported by evidence (Colarusso and Rickard 2017, p. 404).

Alston *et al.,* posit that institutional design is critical to how an institution and in the particular the judiciary functions (Alston *et al.* 2018, p. 229). In their view, this consideration is particularly relevant to the judiciary due to its unique influence on other institutions, in carrying out its role of interpreting and applying the laws that govern a society (Alston *et al.* 2018, p. 229). They point out that the judiciary acts after the legislature has enacted laws and the executive arm has enforced the law (Alston *et al.* 2018, p. 229). It therefore falls upon the judiciary to interpret the legislated laws in a manner consistent with the Constitution, and where an inconsistency exists make a declaration on the constitutionality of the said law (Alston *et al.* 2018, p. 230).

Similarly, it falls on the judiciary to ensure that the actions of the executive arm of government in enforcing the law do not derogate from the constitutionally enshrined rights and freedoms of the individual or group, or any other provision of the law except in accordance with the law (Alston *et al.* 2018, p. 230). This constitutional oversight role gives the judiciary a considerable

service and innovation, (derived from its 2020 draft strategic plan), though not directly applied here can also serve as a viable basis for analysis.

amount of influence over other institutions, which in-turn demands consideration of the values required in contemplating the design of this institution.

Alston *et al.,* argue that in the case of the judiciary, judicial independence, accountability, reputation and limits to authority, are essential to the functioning of a judicial body (Alston *et al.* 2018, pp. 229-230). As will be seen in the sections below much of the institutional design taking place within the Judiciary of Kenya is informed by modern managerial philosophies largely New Public Management (NPM) – in which the values discussed here, as well as technological adoption are a core feature. It will further be seen that integrating certain values into the institutional design of an organisation, such as ensuring accountability in decision-making, will occasionally generate frictions, impact, or potentially "conflict" with other values such as institutional responsiveness which are considered central to the functioning of the system. Designing-in values therefore requires that a delicate balance is maintained in the institutionalization of OAO values, to guarantee systemic coherence and that the goals of institutional transformation are achieved.

3.5.1 Accountability and Responsiveness

Peixoto and Fox (2016) who write on the role of "ICT-enabled citizen voice" in facilitating government responsiveness, criticize the view that voice, citizen uptake or the feedback loop necessarily results in institutional responsiveness (Peixoto and Fox 2016, p. 26). They do not adopt the widely held belief in the "power of sunshine", which draws unsubstantiated causal links between transparency, collective action and institutional action (Peixoto and Fox 2016, p. 26). These authors also distinguish between the concepts of "voice" and "teeth." They do so by considering that some governance platforms lend "voice" to users by providing feed-back *fora* which result in responsiveness – without making such feed-back public (Peixoto and Fox 2016, p. 26). The authors argue that in this case, citizen's voice does not gain its leverage or its "teeth", from transparency and the collective action which is characteristic of downwards accountability systems [i.e. where citizens hold service providers accountable] (Peixoto and Fox 2016, pp. 26-27). In this vein, Sandoval-Almazan and Gil-Garcia's open justice assessment of the judicial websites in Mexico found that while they meet the threshold for enabling access to information and transparency, they fail to facilitate meaningful citizen participation and collaboration (Sandoval-Almazan and Gil-Garcia, 2020 p. 345).

Peixoto and Fox nevertheless state that non-public feedback mechanisms can still result in responsiveness through upwards accountability systems where middle level service providers

are held accountable to senior policy makers and managers on the basis of user feedback (Peixoto and Fox 2016, p. 27). On the other hand, transparency-oriented feedback loops bring about change by enabling civic action (Peixoto and Fox 2016, p. 27). Citizens are therefore given the voice and capacity to hold their governments accountable by the availability of public, relevant and actionable information (Peixoto and Fox 2016, p. 28). Nevertheless, feedback mechanisms need not always be reactive, in some cases, service providers and governments can be proactive, that is, they can proactively reach out to citizens to solicit their views, through a process known as *proactive listening* (Peixoto and Fox 2016, p. 31).

With respect to institutional drivers of change, Peixoto and Fox's research found that in all cases where highest levels of responsiveness was found, the government either played the leading role or was a critical partner in the transparency initiative (Peixoto and Fox 2016, p. 33). This speaks to the importance of government ownership and participation in accountability reforms (Peixoto and Fox 2016, p. 35). They found that in comparison, civil society initiatives had moderate successes while donor led initiatives had almost no impact on responsiveness (Peixoto and Fox 2016, p. 33).

Peixoto and Fox attribute multiple factors to institutional responsiveness, which are all informed by the institution's willingness and capacity to respond (Peixoto and Fox 2016, p. 35). This view reinforces the fact that transparency and accountability cannot be achieved solely through external civic engagement programmes. Open governance begins (but does not end) with government, which through collaborative mechanisms of civic participation, facilitates individual and institutional responsiveness. Peixoto and Fox conclude that "citizen voice" leads to change or improvement of public service delivery (responsiveness), at the intersection of these four arenas of practice:

> *"…the open data movement, open government reforms, anti-corruption efforts and social accountability initiatives.*" (Peixoto and Fox 2016, p. 25)

Within the context of the criminal justice system, judicial accountability refers to the extent to which a judge is answerable to the constituents of the legal system (Alston *et al.* 2018, p. 235). Alston *et al.,* note that how certain systems set up to select judicial officers will often be seen as trading off judicial independence for judicial accountability and responsiveness or *vice versa* (Alston *et al.* 2018, p. 235). This notion goes to show that tensions that may exist in designing-in values into institutions – values which may be seen as competing.

In 2007, Kenya's Judiciary was ranked the fifth most corrupt institution by the National Enterprise Survey Report (Judiciary of Kenya 2017, p. 29). The 2010 Global Corruption

Barometer also reported that 43% of court users had admitted to paying bribes to receive judicial services (Gainer 2015, p. 3). High ranking judicial officials have acknowledged that the overriding problem in the Judiciary was "cultural", and that the Judiciary had developed a culture of "unaccountability, distance, hierarchy and opacity" (Gainer 2015, p. 4). Constitutional focus on judicial integrity was therefore of paramount importance. The JTF set out its path towards a progressive philosophy and culture within the reformed Judiciary. It stated that:

> *"…accountability, openness, results and humility are values that will undergird the institutional design of the Judiciary and inform the daily conduct of the staff."* (Judiciary of Kenya 2012, p. 15).

To do this, the JTF stipulated that the Judiciary would adopt modern management practices centered on a reliable accountability, monitoring and evaluation framework (Judiciary of Kenya 2012, p. 15). These approaches have largely been informed by the New Public Management (NPM) philosophy for organisational design in government, which is an amalgam of new managerialism, and NIE that seeks to address government failure (Kalimullah *et al.* 2012, p. 2; Wallis and Dollery 1999, pp. 62, 79). NPM advocates for hands-on entrepreneurial or private sector management styles as opposed to the traditional centralized bureaucratic model of public administration for enhanced efficiency, and effective performance (Kalimullah *et al.* 2012, p. 2, 16; Raine and Willson 1995, p. 35). NPM emerged in response to the perceived inefficiencies of Classical Public Administration which entailed a strong public sector or bureaucracy and the values of stability and accountability (Jalakas 2018, p. 11). This shift in approach sought to address the social and cultural complexities arising from increased uncertainty, unpredictability, and heightened expectations of the citizenry with respect to the provision of government services (Wallis and Dollery 1999, p. 73).

Under the new managerial paradigm,[57] hierarchy or bureaucracy is balanced with greater emphasis on accountability to the public or consumers of government services, with the aid of a slew of new tools such as surveys and feedback mechanisms (Jalakas 2018, p. 11; Wallis and Dollery 1999, p. 73). New managerialism also moved away from the focus on general rules of procedure to results (Wallis and Dollery 1999, p. 78).

The enhanced autonomy granted to managers is also checked through standardization measures to curb excessive use of discretion, such as the introduction of guidelines and best practice

[57] Also referred to as "generic managerialism" or "corporate managerialism".

circulars on matters such as sentencing and plea bargaining, as well as standardized computing (Raine and Willson 1995, pp. 38-39; Painter 2005, p. 310). Organisational autonomy on the other hand is curbed largely through performance management and accountable managerial hierarchies (Raine and Willson 1995, pp. 38-39; Painter 2005, p. 310).

NPM therefore emphasizes performance measurement, output control (so that rewards are linked to results and not process), disaggregation and decentralization of public services, competition for effective delivery of public services, public values – particularly accountability and responsiveness to users, and the disciplined use of resources (Kalimullah *et al.* 2012, pp. 2-3, 5, 11-12; Painter 2005, p. 308; Cutler and Waine 200, pp. 318-319, 322-323). Due to the influence of agency theory, NPM also has a strong emphasis on contractual relationships and the language of contracts in contractual instruments such as performance, purchase, and ownership agreements (Wallis and Dollery 1999, p. 81).

In Kenya, reforms in the Judiciary have included the institutionalization of performance management and evaluation by establishing a Performance Management Directorate (Judiciary of Kenya 2012, p. 15). The JTF also required that judicial processes are strengthened by eliminating the loopholes that enable unethical practices and corruption by setting up an integrity assurance mechanism, revising the Judiciary Code of Ethics and Conduct and sensitizing the staff and public on the importance of integrity (Judiciary of Kenya 2015, p. 27).

The JTF set out to tackle the centralized and concentrated organisation culture in which the relationships between the judicial officers and the administrative staff were dense, and reporting lines unclear (Judiciary of Kenya 2012, p. 17). Within the pre-2010 judicial structure, vertical and horizontal accountability systems were lacking, and little distinction made between judicial and administrative functions (Judiciary of Kenya 2012, p. 17).

The JTF also sought to ensure the devolution of human resources, budgeting, and finance to 17 regions across the country (Judiciary of Kenya 2012, p. 17). It further required that the Court of Appeal would be established in all major towns and clear reporting lines and accountability systems established (Judiciary of Kenya 2012, p. 17). Accountability has also been institutionalized through the establishment of oversight institutions such as the Office of the Ombudsperson, the Inspectorate Unit under the Judicial Service Commission (JSC), the Performance Management Directorate, the Performance Management Steering Committee and the Audit and Risk Management Directorate (Judiciary of Kenya 2017, p. 31).[58]

[58] With regard to the second phase of transformation under the SJT (Judiciary of Kenya 2017), the Judiciary set out an action plan to tackle corruption by among other methods: (i) strengthening oversight bodies such as the

The Judiciary and the criminal justice sector in general also set out rules and regulations that removed room for the inappropriate exercise of discretion by judicial or administrative officers that could impugn on the integrity of the institution such as the Performance Management Understandings, Bail and Bond Policy, Sentencing Policy Guidelines and Transfer Policy and Guideline for Judges (Judiciary of Kenya 2017, p. 31). All the foregoing interventions, were as a result institutional forms mandated by the 2010 Constitution which as mentioned prior, is founded on the "values" oriented framework for public sector governance.

3.5.2 Judicial Independence, Participation of the People, and Inclusiveness

This section considers the integration of the value of judicial independence into the Judiciary's institutional framework, without compromising the value of participation or stakeholder engagement. Judicial independence, which is recognized in the Universal Declaration of Human Rights requires that a judge is not improperly influenced by an individual, group, or other institution in his or her decision-making (Alston *et al.* 2018, pp. 231, 233). Institutionalizing this value entails a cultural shift on the part of judges, who must value independent decision-making, and desire to be seen as independent in decision-making (Alston *et al.* 2018, p. 233).

Judges must also have the competency required to anticipate the different ways in which the perception of lack of independence may emerge (Alston *et al.* 2018, p. 233). The structure of the legal and political system within which the judicial system is situated, is also of equal importance. In some jurisdictions which prefer a "direct democracy", judges are elected and therefore "answerable" to constituents who are most likely to be affected by judicial decisions (Alston *et al.* 2018, p. 236). In other jurisdictions, a body consisting of legal experts appoint judges, while in others, this power vests with the executive with or without legislative approval (Alston *et al.* 2018, p. 236).[59]

The post-colonial period in Kenya dating from 1963, was dominated by a struggle to establish the separation of powers between the Executive arm of government and the Judiciary. During

Judiciary Ombudsperson and the Audit and Risk Management Directorate, (ii) automation of Judiciary administrative processes and court proceedings, (iii) strict implementation of disciplinary processes, (iii) clarifying organisation structures within the Judiciary, (iv) collaborating the national anti-corruption agency, the Ethics and Anti-Corruption Commission (EACC), (v) enhancing corruption reporting mechanisms (vi) addressing weaknesses in asset management, and (vii) mapping corruption trends in the Judiciary.

[59] Alston *et al.,* make the point that the design of judicial selection varies widely even in a single jurisdiction such as the USA where: *"…of the fifty highest state courts twenty-three are elected, eight are appointed, and nineteen are selected based upon merit."*

this period, the Executive branch was effectively in control of the Judiciary, by virtue of constitutional rules that were purposely designed to fetter the institution's ability to remain autonomous (Judiciary of Kenya 2012, pp. 8-9). As a result, the Judiciary was viewed as an extension of the Executive arm and was often used in doing the bidding of the Executive (Judiciary of Kenya 2012, p. 8).

Until the 2010 Constitution, the President appointed the Chief Justice (Gainer 2015, p. 3). Chief Justice Willy Mutunga was the first holder of that office to be appointed by the President, on the recommendation of the Judicial Service Commission (JSC), and with the approval of the Legislature (Gainer 2015, p. 3). This was a significant step towards the separation of powers and the autonomy or independence of the Judiciary.

The JTF also established that another factor compromising the independence of Judiciary of Kenya, was weak financial policies and operations as the accounting system in many court stations was linked to district treasuries which fall under the Executive arm of government (Judiciary of Kenya 2012, p. 35).

By 2017, the Judiciary under the JTF had managed to disconnect 50 out of the 108 court stations, however these efforts would continue under the Sustaining Judiciary Transformation (SJT) policy framework (Judiciary of Kenya 2012, pp. 34-35). On 1st July of 2022 the Judiciary Fund was operationalized, effectively giving the Judiciary greater independence in the management and control over the funds allocated to it by the National Assembly (Judiciary of Kenya 2022, p. 210). Technology and automation of payment and revenue collection systems by the Judiciary is also seen as a key tool in achieving judicial independence, a fact consistent with the fourth pillar of the JTF which requires harnessing technology "as an enabler of justice."

The goal of institutionalizing judicial independence however needs to be balanced with ensuring that the judiciary is a complementary partner to the other branches of government, that is, the Legislature and the Executive (Judiciary of Kenya 2012, p. 11). One of the key ways this can be achieved is by also integrating stakeholder engagement, or the "participation" of all branches of government and the public, in policy or decision-making and implementation (Judiciary of Kenya 2012, p. 15). Once again, the value of "participation" is a key feature of NPM which advocates for maximizing broad participation of stakeholders and the public in "bottom-up" decision-making (Kalimullah *et al.* 2012, pp. 14, 18; Painter 2005, p. 310; Klenk and Reiter 2019, p. 4).

In the United Kingdom under New Labour, the managerial reform agenda in the criminal justice system entailed reorientation towards the interests of victims and witnesses of crime,

vertical and lateral multi-agency collaboration or coordination, and evidence-based policy and practice founded on "what works?" (Painter 2005, pp. 308-309; Raine and Willson 1995, p. 37; Cutler and Waine 200, p. 318). Coordination has been defined as, "*the alignment of tasks and efforts of multiple actors in order to reduce redundancy and increase policy cohesion"* (Jalakas 2018, p. 13).

As noted in Chapter One, Kenya's justice sector, stakeholder coordination and the value of participation is facilitated through the National Council on the Administration of Justice (NCAJ).[60] The NCAJ is a high-level policy-making, implementation and coordinating mechanism for virtually all relevant justice sector state and non-state stakeholders (Judiciary of Kenya 2012, p. 15).

At the grass root level, the Court Users' Committees (CUCs) established since 2006, bring together court users, or their representatives and the actors in the justice sector (Judiciary of Kenya 2012, p. 15; Gainer 2015, p. 5). The inclusion of court users as a core facet of the NCAJ is a significant step towards advancing the previously ignored national values of participation and inclusion, as well as individualizing justice.

This inclusive approach acknowledges the human impact of justice systems and processes, and therefore re-orients the focus of the criminal justice system to the goal of ensuring socially just outcomes such as access to justice for all, irrespective of class or other status.

The focus on multi-agency collaboration, and the attendant the values of transparency, accountability, efficiency and participation, brought with it a revolution in the use of ICT for coordination of interagency action and partnerships, which according to some, in the post-NPM dispensation has given way to "new digital-era governance" or e-governance solutions combining aspects of open governance and e-participation (Painter 2005, p. 309; Klenk and Reiter 2019, pp. 4, 5; Traunmüller and Lenk 1996; McNabb 2016; Jalakas 2018, p. 15).

Finally, Miller states that when "designing-in" values into institutions, it is essential that the institution's different dimensions, that is, its function, culture, structure and use of technology are taken into consideration (Miller 2015, pp 769-771). Gavelin *et al.*, make the point that failure to consider extraneous factors such as culture could also undermine the delivery of the open government reforms being pursued (Gavelin *et al.* 2019, p. 15).

[60] See NCAJ website here: https://ncaj.go ke [Accessed 1 February 2021]

3.5.3 Transparency and Efficiency

Steward and Stuhmucke (2020) write about the tension in values that arise from the administration of special leave to appeal applications (SLAs) by Australian courts. SLAs entail the exercise of both the administrative and judicial function of the court, and are exercised contrary to open justice principles and the open court rule, in preference for judicial efficiency (Steward and Stuhmucke 2020, pp. 186-187). SLA's are administered in the Australian context as a filtration mechanism to manage the appellate court's caseload for more efficient outcomes (Steward and Stuhmucke 2020, p. 187).

However, as a result of regulatory changes in 2016, and contrary to open justice principles and the open court rule, written reasons are not provided for the determinations made, and oral hearings may not even be required (Steward and Stuhmucke 2020, p. 187). Steward and Stuhmucke (2020) view this as an imbalance between the principles of "open justice" and "efficient justice", both of which they find to be essential for the rule of law (Steward and Stuhmucke 2020, pp. 187-188).

Open justice principles safeguard against secrecy, arbitrary use of judicial power and require public access to the administration of justice, while the efficient justice principle seeks to safeguard against the risks and consequences of delayed justice (Steward and Stuhmucke 2020, p. 190). These authors call for increased transparency in the administration of SLAs to rebalance and correct this emphasis on efficiency over openness, by proposing that all written submissions by the parties are made publicly available (Steward and Stuhmucke 2020, pp. 188, 206).

3.6 Conclusion

The foregoing discussion began by demonstrating that antithetical to the "value neutral" thesis, technical artefacts can be designed to advance human values of ethical importance. Value Sensitive Design (VSD) was seen to be one of the approaches for incorporating such values in a systematic way into technical artefacts. It was noted that the discussion on technology and values could only be done in the context of institutional or organisational values-oriented design or reform. It emerged from this latter discussion that incorporating values into the design of organisations entailed a delicate balance, as in many cases the values in question are in conflict or competition. This approach of incorporating values into the design of justice sector organisations was seen to be consistent with new managerial approaches undertaken to reform

the public sector, such as NPM which emphasize values such as transparency, accountability, and participation, as well as other factors including decentralization, performance management, efficiency, and the use of technology.

It was further seen that in the context of the criminal justice sector, both in Kenya and in other jurisdictions, these reforms often began at the Judiciary, with needs of court users being front and center. It was also seen that the net effect of such reforms is the lowering of the barriers or transaction costs to the delivery of justice.

Having understood how values, institutions and technology converge to bring about institutional and ultimately societal transformation, the question which remains is what role blockchain in particular can play in mitigating some of the institutional bottlenecks and high transaction costs, towards the goal of delivering justice within the context of an open access society. Chapter Six will explore precisely how blockchain technology can advance the values in Article 10 of the Constitution, as well as enhance efficiency in the administration of justice in Kenya.

4.0 RESEARCH METHODOLOGY

This chapter lays out the approach adopted in undertaking the research and in achieving the research objectives of the thesis. It serves as bridge between the theoretical analysis in Chapters Two and Three, and the empirical research undertaken in Chapter Five. It therefore also provides a basis for the blockchain-based solutions explored in Chapter Six, in response to the structural and institutional gaps identified in Chapter Five.

Section 4.1 lays out the aims and objectives of the research which in sum entail assessing the role of values and technology in reforming Kenya's justice sector, particularly as it pertains to policy making and implementation. The thesis seeks to achieve this goal by adopting a mixed method approach to the research. Section 4.2 defines the research questions guiding the research, while section 4.3 elaborates on the mixed methods adopted. Section 4.4 examines the challenges faced by the research and provides an insight as to how they are resolved or mitigated.

4.1 Research Aim and Objectives

The ultimate goal, and original contribution of this research is to assess the role of technology, and in particular blockchain technology, as an "enabler of justice" within Kenya's criminal justice context. The research achieves this by first interrogating the role of technology in transitioning Limited Access Order (LAO) criminal justice institutions, into Open Access Order (OAO) institutions where barriers or fetters to justice are minimized. In particular, the research seeks to determine how technology can facilitate this transformation by entrenching the values of transparency, accountability, participation or democracy and social justice in decision or policy-making and implementation, and in the very fabric of justice sector institutions and organisations.

In making the foregoing assessment, the research adopts the following two-pronged approach: first it determines the extent to which criminal justice institutions in Kenya have evolved towards the open access ideal embodied by the national or constitutional values. This assessment is made largely through an analysis of the incorporation of the values into the policy-making and implementation processes by the individual institutions or agencies, and as a collective. This analysis also involves determining the extent to which institutional hierarchies or bureaucratic structures choke or fetter a cohesive and open access approach to the administration of justice.

Secondly, the research interrogates the role which can be played by technology, and in particular blockchain technology in achieving the OAO ideal, and in transforming the administration of justice in Kenya. The research therefore seeks to answer the question whether technology can have a role in mitigating some of the challenges or transaction costs related to the transitioning of LAOs to OAOs.

These objectives are achieved through a mixed methods approach, combining both quantitative and qualitive data. The research incorporates a survey of purposefully selected applicants from 10 criminal justice institutions. The research also entails interviews with subject matter experts on various agencies within the Kenyan criminal justice system, and on the design and implementation of blockchain technology. Finally, the research includes a secondary review of primary data and literature on the gaps that exist within the criminal justice sector, which impede the delivery of justice.

4.2 Research Questions and Research Design

To achieve the foregoing research objectives, the research sought to answer the following five substantive research questions:

RQ1. To what extent have Kenyan criminal justice institutions embraced Open Access Order (OAO) values?

Under this broad question, the survey respondents were asked to rate the adoption of the four key national or constitutional values into their work culture, and to indicate those values that ought to be embraced more. These values include transparency, accountability, democracy, and social justice. To further contextualize the findings in this regard, the respondents were further required to rate key threats to integrity and the delivery of justice in their institutions. The data obtained from the survey responses was triangulated through further inquiry during the key informant interview of both the internal and external national criminal justice experts.

RQ2. To what extent does the Kenyan criminal justice approach allow for participation in policy-making and implementation?

The category of questions (in the survey and interviews) under this broad question sought to determine the degree to which the OAO value of democracy has been actualized in the

administration of justice in Kenya. This discussion therefore sought to establish the fetters to participation in decision-making, and the degree of access provided to both internal and relevant external parties in the decision/policy-making and implementation processes. The "participatory" approach was assessed on three levels, that is: (i) the staff member's / respondent's participation in decision-making impacting on the delivery of justice, (ii) criminal justice stakeholder participation in policy-making and implementation impacting on the delivery of justice, and (iii) public participation in decision-making impacting on the delivery of justice. These questions also probed into the reasons why a participatory approach enhances, or does not enhance the delivery of justice, as well as the areas where more engagement was pursued or required. Respondents were also asked to describe their agency's bureaucratic structures and the impact of those structures on decision and policy-making. Finally, this line of inquiry sought to determine whether participation of some stakeholders was more important or critical to the administration of justice, than the participation of other (presumably) less important stakeholders.

RQ3. What are the mechanisms used to facilitate "a participatory approach" in policy/decision-making and implementation within the justice sector?

Under this rubric of questions both technological and non-technological mechanisms were assessed to determine their prevalence and effectiveness in facilitating stakeholder participation (staff, criminal justice, public), in policy-making and implementation. This set of questions therefore set the foundation for the analysis on the role that technology may or may not play in "opening" Limited Access Order (LAO) institutions, from the viewpoint of the end user.

RQ4. What is the role of technology in facilitating the administration of justice?

These questions allow for a deeper assessment of the role that technology can play in enhancing the administration of justice. The survey in particular assessed the reasons why technology or mechanisms that are available were "used" or "not used" by justice sector actors, as well as the effectiveness of these technologies / mechanisms. These set of questions revealed the human or infrastructural barriers to the use of technology within the criminal justice system. This section also sought to examine new technologies adopted by the institutions, and the reasons that such adoption succeeded or failed. Emphasis was also placed on the role of automated

agency and interagency case or records management systems, as well as automated performance management systems in enhancing interagency coordination, and / or the delivery of justice.

RQ5. What is the potential role of blockchain technology in facilitating the administration of justice?

Both the interview participants and survey respondents were asked to indicate their knowledge and understanding of blockchain technology. They were also asked to indicate their opinion as to whether, based on their understanding, blockchain technology could enhance the constitutional values and efficiency in the administration of justice. These questions sought to achieve two goals: first to establish the level of understanding of the average criminal justice actor of blockchain technology and secondly, to determine their openness to the introduction of this technology in the administration of justice. The research also incorporated expert interviews on the design and implementation of blockchain solutions for the criminal justice sector, in an effort to understand its various use-cases, and the possible contribution and limitations of the technology in the sector.

4.3 Mixed Methods Approach

Mixed methods have been promoted by various researchers in the field of criminal justice such as Silverman who considers it absurd to push "too far the qualitative / quantitative distinction" (Noaks and Wincup 2004, p. 7). Noaks and Wincup note that they occasionally use the same data collection method to generate both qualitative or quantitative data (Noaks and Wincup 2004, p. 8). They argue that the primary effect of adopting a multi-pronged approach is triangulation, which has the advantage of increasing the validity of the findings (Noaks and Wincup 2004, p. 9). These authors cite Denzin (1970) who suggests that triangulation is the key *"to overcoming intrinsic biases that stem from single method, single observer and single theory studies"* (Noaks and Wincup 2004, p. 9). The present research therefore utilizes an online survey, key informant interviews as well as secondary research methods to triangulate and strengthen the findings from the analysis in Chapter Five of the thesis.

The online survey was adopted as the primary method of collecting data in the present research. The *mentimeter*[61] platform was selected for this purpose, as many of the respondents have

[61]See the platform here: https://www mentimeter.com [Accessed 10 December 2022]

previously interacted with it in the course of their work. Sue and Ritter advocate for the use of online surveys where the following conditions are met: (i) where there is a large and widely distributed sample size, (ii) where there are time constraints on both the researcher and respondents, (iii) where anonymity is critical due to the sensitivity of the subject, (iv) where the respondents have internet access, and (v) the technical ability to navigate the tool (Sue and Ritter 2007, p. 5).

The choice to conduct an online survey was therefore also informed by the need to cover many institutions (10), within the National Council on the Administration of Justice (NCAJ), and within the said institutions a relatively wide number of respondents (up to 8 per institution). This research was also being conducted within the bounds of a limited amount of time and resources for both the researcher and the respondents. The requirement that respondents provide information on their institutions further raised some anonymity concerns which are suitably mitigated by the survey platform through its embedded anonymity features.

The wide coverage of institutions was necessary to gain a more complete picture on bottlenecks to the delivery of justice in Kenya. The use of the survey also enabled the respondents to respond to a broad spectrum of scale, multiple choice and open-ended questions related to their institutional practices. In total, the survey constituted a total number of sixty (60) questions covering all aspects of the research.[62]

4.3.1 Sampling of the Survey Respondents

As noted above, the respondents of the survey were drawn from ten criminal justice agencies which are represented within the NCAJ, that is: the Judiciary of Kenya (Judiciary), Office of the Director of Public Prosecutions (ODPP), National Police Service (NPS), Kenya Prisons Service (KPS), NCAJ Secretariat, Probation and Aftercare Service (PACS), Department of Children's Services (DCS), Non-Governmental Organisations (NGOs) and other Independent bodies,[63] Ethics and Anti-Corruption Commission (EACC) and the Witness Protection Agency (WPA).

[62] See Survey Questions in Annex I.

[63] The NGOs and independent bodies category sampled included national and international (development partner) organisations such as: the Legal Resources Foundation, the International Development Law Organisation, the International Commission of Jurists (Kenya), United Nations Human Rights Office of the High Commissioner (OHCHR) and Resources Oriented Development Initiatives (RODI Kenya). Independent or autonomous bodies are those which may be mandated or constituted by the law, but act independently in performing certain roles such as oversight over the State and other entities e.g. the Kenya National Commission on Human Rights (KNHCR).

A minimum of four and a maximum of eight respondents from the foregoing ten NCAJ institutions, cutting across different job groups and varying degrees of seniority were sampled for the online survey. A total of 63 respondents started the questionnaire, however after data cleaning, data from 57 of the respondents was usable and included in the analysis. The job groups covered by the survey include: judicial officer (magistrate) or judge, prosecution counsel, police officer or investigator, probation officer, children officer, legal officer or defence counsel, programme or project officer, administrators, IT or communications officer, oversight or anti-corruption officer, and witness protection officer. The research also sampled junior, midlevel, and senior officers who had served from less than a year, to over 20 years, in their respective institutions.

The key sampling technique adopted for the survey was the purposive non-probability sampling method and to a lesser extent, convenience sampling. The literature suggests using non-probability sampling where the use of probability sampling is inappropriate or impossible (Maxfield and Babbie 2015, p.222). This includes situations where the subject of study is a subset of a larger population whose members are easily identified but whose enumeration to create a sampling frame or list would be impossible (Maxfield and Babbie 2015, p.222). Convenience sampling on the other hand entails leveraging one's proximity to the respondents, and their availability and willingness to participate in the research (Etikan 2016, p. 2). Convenience sampling is also recommended where the target population is homogenous, so that the results obtained would not differ much if the subjects had been randomly selected (Etikan 2016, p. 2).

Purposive or judgement sampling entails the identification and selection of respondents based on their knowledge and experience relevant to the research (Etikan 2016, p. 2). This mode of sampling therefore targets "information rich cases" that would provide the most valuable insight to the research (Etikan 2016, p. 2).

In the present research, the population of interest was the membership of the NCAJ which comprises an identifiable membership of a largely homogenous group, that is, all national criminal justice agencies in Kenya, as well as some NGOs and autonomous / independent institutions with a more dominant mandate in the criminal justice and human rights space. Enumerating sample elements or units within this membership would prove to be impossible, therefore the sampling technique selected largely leverages the researcher's intimate knowledge, relationships, and work with the NCAJ, and the research objectives which are centered on the NCAJ and its membership (Maxfield and Babbie 2015, p. 222). The sample

was therefore purposively selected to be representative principally of the criminal justice institutions within the NCAJ, and to a lesser extent, the professional jobs groups and hierarchies within the said institutions. There was also a self-selecting dimension in that only those available and willing to participate (who were the vast majority of those approached), did so.

Maxfield and Babbie posit that samples need not be representative in all respects – rather they should be representative of the characteristics that are most relevant to the substantive interest of the study (Maxfield and Babbie 2015, p. 205). In the present study, which focuses on institutions, representation by institution is more important than the geographical representation of the respondents. However geographical representation is naturally taken into account by the fact that the respondents are drawn from the NCAJ population, which is nationally constituted.

However, since non-probabilistic methods were chosen, the analysis and interpretation of the results is indicative rather than conclusive, as the sampling methods selected are prone to the hidden bias and the problem of outliers (Etikan 2016, p. 2). To some extent, these challenges were mitigated using the bootstrapping (resampling) function in the IBM Statistical Package for Social Sciences (SPSS), in the analysis and interpretation of the survey results.

4.3.2 Structure of the Survey and Analysis

Prior to its administration to the respondents, the survey was piloted on two third parties to establish the suitability of the questions, and of its structure. The first part of the survey contained preliminary questions which sought to establish the background of the participants, such as their gender, employer, functional role, seniority, years of experience and level of job satisfaction. These preliminary questions were designed to provide a basis for disaggregating and analyzing the data, primarily on the basis of the respondent's agency/institution and to a lesser extent, level of seniority. The questions were largely structured in ordinal five (5) point or seven (7) point ranked scales, used to rate different aspects of the criminal justice system under assessment. In most cases, an "Other" category was provided with each assessment to allow for open ended qualitative data and ensure that the responses were as comprehensive as possible. In a limited number of cases categorical data was obtained from questions requiring "Yes", "No", "I do not know" responses, or other multiple-choice questions as appropriate. Frequencies were also used to compare observations between the different organizations.

As non-probabilistic sampling methods were used, non-parametric statistical methods were applied in analyzing the data. This is because non-parametric measures are better suited to data sets that do not meet the (normal) distribution and (large) sample size requirements or assumptions of parametric methods (Hesse *et al.* 2018, pp. iii, 1, 4-5). The measures adopted therefore, were selected with the objective of identifying indicative trends warranting further inquiry, rather than making conclusive inferences on the population being studied (Hesse *et al.* 2018, pp. 3-4). These statistics largely included: (i) median and mode to measure central tendency, (iii) Inter-quartile Range (IQR) to measure variability (spread and dispersion), and (iii) Spearman's rho correlation to measure the strength and direction between two ordinal variables (Pallant 2016, pp. 73, 146, 151).

4.3.3 Key Informant Interviews

Seven key informant interviews were also carried out to triangulate and / or provide further context to the survey responses. The interviews were for this reason conducted after the analysis of the survey data which drew out various observations on all the key dimensions of the present research. Insights from the analysis of the survey data were then integrated into the key informant interview questions, to either confirm, provide a different perspective or add further context to those observations.

In this regard, [redacted] (Sen[redacted]NCAJ),[64] and a senior ICT officer [redacted] (SenJud-ICT)[65] were interviewed. The interview with Sen[redacted]NCAJ provided in-depth context to the challenges experienced within the justice sector with respect to interagency coordination and the role that technology has played in this regard, particularly in the post-COVID-19 context. The interview with SenJud-ICT provided useful information on the use of automated case management tools by the Judiciary and some of the challenges experienced in fully rolling them out. These interviews are therefore geared towards gaining in-depth knowledge on the approaches and attitudes of the various agencies towards technology, particularly towards the integration of the technological systems that would enhance inter-agency collaboration. The interviews also sought to establish what technologies have worked and why, as well as what has not worked. They also sought to lay the groundwork for understanding the transformative opportunities that blockchain can offer within the NCAJ

[64] See interview questions in Annex IV.
[65] See interview questions in Annex III.

paradigm of enhanced inter-agency collaboration, as well as the challenges that the adoption of this innovation as a solution would present.

Three external (national) experts on individual criminal justice agencies were also interviewed, that is: (i) an expert on the Department of Children Services and the Probation and Aftercare Service (Exp-DCS/PACS), (ii) an expert on the National Police Service, Office of the Director of Public Prosecutions and Witness Protection Agency (Exp-NPS/ODPP/WPA) and (iii) an expert on NGOs / Independent bodies, the Judiciary and the National Council on the Administration of Justice (Exp-NGO/JUD/NCAJ).[66] [redacted] The expert interviews were able to provide outsider (external) insight on the assimilation of the cultural values in the respective institutions. [redacted]

Finally, two experts on the implementation and design of blockchain systems were interviewed. The first was an international expert on e-governance working with the government of Estonia, who was also interviewed to provide some insight into the application and use-cases of blockchain in the justice system [e-justice] (Exp-Egov/Estonia).[67] The second was an ICT expert with several years of experience in the development, design and implementation of blockchain-based solutions outside the criminal justice sector (Exp-Blockchain).[68] These interviews enriched the discussion in Chapter Six, which examines the benefits of blockchain as a mechanism of governance, as well as some of the limitations, risks and challenges that can and should be anticipated in its implementation.

4.3.4 Secondary Data

The project also involved the collation of secondary research. This entailed the review of the strategic documents and reports of the criminal justice agencies, as well as independent research carried out on the gaps within the criminal justice sector that impede the administration and delivery of justice. In this regard the analysis incorporated the review of: (i) the PLEAD[69] Baseline Study conducted by the United Nations Office on Drugs and Crime

[66] See interview questions for all three experts in Annex II.
[67] See interview questions in Annex V.
[68] See interview questions in Annex VI.
[69] Programme for Legal Empowerment and Aid Delivery in Kenya - Funded by the European Union and managed by the United Nations Office on Drugs and Crime (UNODC), and the United Nations Development Programme (UNDP).

(UNODC 2018), (ii) the State of the Judiciary and the Administration of Justice (SOJAR) Report (Judiciary of Kenya 2020[a]), (iii) the 2016 Kenya National Commission on Human Rights (KNCHR) report on the national values and principles of governance (KNCHR 2016), (iv) The Justice Needs and Satisfaction in Kenya survey (Hiil 2018) and (v) the 2016 Criminal Justice System Audit (NCAJ 2016, p. 77).

This research also entailed the review of several strategic plans, including those of: (i) the NCAJ (NCAJ 2021), (ii) the Judiciary (Judiciary of Kenya 2020[b]), (iii) the National Police Service (NPS 2018), (iv) the Office of the Director of Public Prosecutions (ODPP 2016), (v) the Ethics and Anti-Corruption Commission (EACC 2018), and the (vi) Judiciary Transformation Framework [JTF] (Judiciary of Kenya 2012) and (vii) the Sustaining Judicial Transformation [SJT] blueprints (Judiciary of Kenya 2017).

These documents were used in three primary ways. First, they were used to establish the self-reported structural gaps or challenges within the different institutions related to the administration of justice, and in particular related to the lack of technological capacity. Second, they were also used to identify the strategic goals of the individual institutions related to the adoption of technology. Finally, the documents were also used to glean insights on the assimilation of values in the institutions examined.

4.4 Challenges

The key challenge in the research process arose from two competing requirements necessitated by the nature of the research. First, the research entailed a system-wide enquiry into the workings of the criminal justice sector of Kenya, to enable a robust understanding of the sector-wide gaps that exist in the administration of justice. This requirement therefore necessitates that data be obtained from a large sample of respondents, representative of virtually the entire criminal justice system, cutting across the institutional hierarchies and functional roles. The need for wide representation however competed with the need to gather in-depth information gleaned from the experience of each respondent as a participant in the sector. This dual challenge was compounded by time constraints on both the researcher and the respondents in effectively responding to, or administering the research while fulfilling daily work commitments.

While the in-depth interview format would therefore have been ideal for the research in question, it could not be practically executed due to the breadth of responses that would be

required to allow for a robust analysis, and for the effective comparison of groups. This challenge was addressed by adopting a mixed methods approach to data collection. First, a survey with simple yet detailed standardized questions was administered to obtain the widest possible responses, from a large number of respondents. Within the survey, triangulation was adopted to ensure that responses were clarified with subsequent iterations of the questions. This feature was employed to ensure that ambiguities in responses are minimized, since clarification could not be obtained in-person. The survey also provided the respondents with a wide spectrum of answers to choose from, and as far as possible, an "other" category (open ended option) was provided to allow for alternative responses where the initial list was not exhaustive. This latter approach was aided by the fact that the researcher has in-depth subject knowledge as a criminal justice system participant in Kenya. Rating or scaling questions were also preferred over multiple-choice questions, as they allowed for non-exclusive responses, that is, where more than one response was possible for the same question. These allowed respondents more latitude in specifying the degree to which one intervention was more impactful or relevant, than another e.g., the degree of effectiveness of one technology in comparison to another. The various options provided also ensured that all possible scenarios were considered and addressed by the respondents. The survey also employed open-ended questions where appropriate. The survey was supplemented by key informant interviews and secondary research which provided in-depth information and added context to the gaps and challenges prevalent in the criminal justice sector, and the actions that have succeeded, failed or are currently underway to address them.

4.5 Conclusion

This chapter has provided an overview of the methods adopted in the collection and analysis of the data in this research. Chapter Five below proceeds to present the said data from the online survey, key informant interviews and secondary research. Chapter Five also analyses and presents the findings and conclusions. This analysis forms the basis for the exploratory discussion in Chapter Six, on the possible contribution of blockchain technology in addressing some of the gaps identified.

5.0 VALUES AND TECHNOLOGICAL REFORMS IN KENYA'S JUSTICE SECTOR

This chapter presents the research findings and is composed of three sections. Section 5.1 examines the assimilation of the OAO values into the fabric of Kenya's justice sector agencies. It does this by synthesizing and analyzing the quantitative and qualitative data collected for this research, on the inculturation of the constitutional values into the policy processes of criminal justice bodies. It also does so by examining the survey data on the impact of organisational hierarchies, or bureaucratic structures on policy or decision-making and implementation.

This analysis also compares the role and impact of values, to the role of "facilitation" or the provision of tools to perform functional roles, on the delivery of justice. This part of the thesis therefore answers the question whether "values" or adequate "facilitation," has a greater role to play in enhancing the delivery of justice. To achieve this, the section analyses the surveyed respondents' perceptions of the prevailing threats to integrity, as well as those that threaten delivery of justice in the justice sector.

Section 5.2 examines the status of technological adoption and the role of technology in "opening up" justice sector agencies. This is done by analyzing the survey responses about the technologies which are available to justice sector actors in their functional roles (including technology that is available, but not used due to various factors). The reasons behind the success or failure in the implementation of technology are similarly considered, as well as the mechanisms employed in the implementation of a "participatory or democratic approach" in decision or policy-making. This section focuses on the role of automated agency and interagency case management systems in enhancing coordination, as well as the impact of the COVID-19 pandemic on technological adoption within the criminal justice sector.

This discussion lays the foundation for the concluding part of the chapter in section 5.3, which assesses the policy and practical implications of the observations made to technological uptake in the criminal justice sector, and the role of agencies such as the National Council on the Administration of Justice (NCAJ). This analysis takes into account considerations to be made in the adoption of technologies (such as blockchain), that would address the gaps identified with respect to values, work processes and facilitation, in the administration of justice.

5.1 Analysis of the Assimilation of the Core Values in Kenya's Justice Institutions

The key objective of the present discussion is to assess the extent to which OAO values enshrined in Articles 10 and 232 of the Constitution, have been assimilated into the culture and practices of Kenya's criminal justice institutions, in the context of policy-making and implementation. This is done to better understand the role that the values play in these processes, and to identify the gaps that persist in this regard.

5.1.1 Analysis of the Individual and Aggregated Values

This research assessed the assimilation of the national or constitutional values of democracy, social justice, transparency, and accountability. This analysis of the values was done on two levels. First, the values were assessed individually, and secondly, after factor analysis, they were assessed as an aggregate variable or value. In the latter case, the individual values were computed or "added" into a single "values" variable using the SPSS "Compute" function (Greasley 2008, pp. 127-128; Pallant 2016, pp. 104-105). ***Table 5*** below, establishes that the constitutional values are strongly correlated with a determinant statistic of 0.08.[70]

Table 5: Factor Analysis Correlation Matrix[a]

		Democracy	Social Justice	Transparency	Accountability
Correlation	**Democracy**	1.000	.585	.730	.692
	Social Justice	.585	1.000	.582	.584
	Transparency	.730	.582	1.000	.835
	Accountability	.692	.584	.835	1.000

a. Determinant = .080

The data further suggests that the individual factors (democracy etc.) load or group together on the same construct of "values" and can therefore be analysed as a single "computed" variable.[71] The analysis of the computed values aimed to ascertain how these values had been adopted by each agency, and across all the criminal justice agencies as a whole. Secondly each of the four values were also analysed with respect to each agency, as well as cumulatively across all the

[70] The determinant statistic is greater than 0.00001. A determinant statistic less than 0.00001 would indicate that the items are unrelated. The Kaiser-Meyer-Olkin (KMO) value is 0.807 (Bartlett's test sig. <.001).

[71] Note that only one component was extracted (Eigenvalue > 1, that explained 75.339% of the variance, which suggests that the individual variables/items load on a single theoretical construct. The component matrix also indicates that the factor loadings of the individual items are between 0.779 and 0.914.

agencies. Respondents were asked to rate to what extent the four values, collectively and individually describe their work culture on a 5 point scale ranging from "Never" to "Always".

The survey results show that respondents tend to believe that their organisations have adopted all four Open Access Order (OAO) values to a high degree. ***Table 6*** below indicates that across all the agencies, the median score for computed values was 4 or "Often". Each of the four values also scored a median of 4. This relatively high rating indicates that the promulgation of the 2010 Constitution, and the institutional reforms that followed, have at a minimum, had a discernable positive cultural impact on the landscape of Kenya's criminal justice sector.

Table 6: Medians of Work Culture Values

(1=Never, 2=Rarely, 3=Sometimes, 4=Often, 5=Always)

	Computed Values	Democracy	Social justice	Transparency	Accountability
Overall Median	**4.00**	**4.00**	**4.00**	**4.00**	**4.00**

However, despite the apparent uniform median rating for each of the values across the board, 95% Confidence Intervals obtained on each of the values through the SPSS bootstrapping (re-sampling) function,[72] suggest that the values of transparency and accountability are lagging slightly behind the values of democracy and social justice in the work culture of the agencies. The confidence intervals of the values of transparency and accountability range from a lower bound median of 3 ("Sometimes"), while that of democracy and social justice range from a median of 4 ("Often").[73] This finding is confirmed by the fact that the respondents reported that transparency and accountability needed to be *embraced more* by their agencies as a matter of "Essential priority". With respect to the values of democracy and social justice, the respondents indicated that they should be *embraced more* as a matter of "High priority" as indicated in ***Table 7*** below. These data therefore suggest that despite the relatively high inculturation of the national values by criminal justice organisations post the 2010 Constitution, there is a perception that there is still room for greater assimilation of the values into the institutional fabric of the agencies.

[72] Bootstrapping is a resampling function which is carried out to minimize potential bias in skewed data samples. See here: https://methods.sagepub.com/dataset/howtoguide/bootstrapping-ehs-2009 [Accessed 15 February 2021]

[73] Transparency [95% CI, 3-4], Accountability [95% CI, 3-5], Democracy [95% CI, 4-4] and Social Justice [95% CI, 4-5]

Table 7: Medians of Values to be "Embraced More"

(1=Not a priority, 2=Low priority, 3=Medium priority, 4=High priority, 5=Essential priority)

	Democracy and Participation of the People	Social justice	Transparency	Integrity and Accountability
Overall Median	**4.00**	**4.00**	**5.00**	**5.00**

The high ratings attributed to the *"embrace more"* variables further suggest that the respondents believe that the core values play an important role in the functioning of their agencies.

The survey data also suggests a congruence between the agencies that reported higher levels of transparency and those reporting higher levels of accountability. In essence, the agencies reporting higher levels of transparency generally reported higher levels of accountability and *vice versa*.[74] This suggests that at least in the minds of the respondents, both these values are closely associated. This finding is confirmed by a Spearman's rho (non-parametric) test which results in a correlation coefficient of 0.839 and a finding of statistical significance at the 0.01 level (p value 0.000) as shown in ***Table 8*** below.[75]

Table 8: Spearman's rho Transparency and Accountability Correlation

			Transparency	Accountability
Spearman's rho	**Transparency**	Correlation Coefficient	1.000	.839**
		Sig. (2-tailed)	.	.000
		N	57	56
	Accountability	Correlation Coefficient	.839**	1.000
		Sig. (2-tailed)	.000	.
		N	56	56

**. Correlation is significant at the 0.01 level (2-tailed)

With respect to the performance of individual agencies, the disaggregated and computed data indicates that the National Council on the Administration of Justice (NCAJ) Secretariat, NGOs / Independent bodies and the Ethics and Anti-Corruption Commission (EACC) respondents

[74] See Table 9 overleaf: "Medians of Computed and Individual Work Culture Values"

[75] The Spearman's correlation test also confirms statistically significant associations between either transparency or accountability, with the values of democracy and social justice. However, the strength of these correlations is much lower than that of transparency and accountability, as their coefficients range from 0.513-0.673.

have a more positive outlook towards the assimilation of OAO values by their agencies. This contrasts with the Office of the Director of Public Prosecutions (ODPP), National Police Service (NPS) and Department of Children's Services (DCS) respondents, who have a more negative perception on the adoption of the said values by their agencies.

Table 9 below shows that NGOs / Independent bodies, the NCAJ Secretariat and EACC had the highest median rating of 5 ("Always), for the computed values. The data further suggests that there was closer agreement among the NGO and NCAJ respondents that the said values were "Always" prevalent in their work cultures, compared to the EACC respondents.[76] Conversely, and as noted above, the lowest median (3) for the computed values was reported by DCS, NPS and ODPP. This indicates that the central tendency is for these latter agencies is to adopt these values "Sometimes".

Table 9: Medians of Computed and Individual Work Culture Values

(1=Never, 2=Rarely, 3=Sometimes, 4=Often, 5=Always)

Agency	Computed Values	Democracy	Social justice	Transparency	Accountability
1. Department of Children's Services **(DCS)**	**3.00***	3.00	400	3.00	3.00
2. Non-Governmental Organisations **(NGOs)**	**5.00***	4.00	5.00	5.00	5.00
3. Ethics and Anti-Corruption Commission **(EACC)**	**5.00***	4.00	4.00	5.00	5.00
4. Judiciary of Kenya **(Judiciary)**	**4.00**	4.00	3.50	4.00	3.50
5. Kenya Prisons Service **(KPS)**	**4.00**	3.00	5.00	3.00	5.00
6. National Council on the Administration of Justice **(NCAJ Secretariat)**	**5.00***	5.00	5.00	5.00	5.00
7. National Police Service **(NPS)**	**3.00***	3.00	3.50	3.00	3.00
8. Office of the Director of Public Prosecutions **(ODPP)**	**3.00***	3.00	3.00	3.50	2.50
9. Probation and Aftercare Services **(PACS)**	**4.00**	4.00	5.00	3.00	4.00
10 Witness Protection Agency **(WPA)**	**4.25**	4.50	4.50	4.00	4.50
Total	**4.00**	**4.00**	**4.00**	**4.00**	**4.00**

(*=Extreme statistics)

[76] NGOs / Independent bodies (IQR=4.75-5.00), NCAJ (IQR=4.63-5.00) and EACC (IQR=3.50-5.00)

The high ratings of the NCAJ and NGOs / Independent bodies are not surprising as these organisations perform prominent oversight roles within the justice sector, and therefore place greater emphasis on the adoption of the values.

By way of illustration, the Kenya National Commission on Human Rights (KNCHR)[77] is an autonomous national human rights institution mandated under its enabling Act of Parliament[78] to ensure the observance of human rights *"in all spheres within the Republic of Kenya"* (KNCHR 2016, p. vii). Article 252 of the 2010 Constitution empowers independent Commissions such as KNCHR to conduct investigations into complaints made by members of the public. Article 254 empowers them to issue public reports on a given issue. In the performance of this constitutionally vested oversight role, in 2016 KNCHR prepared and published an alternative report[79] on the status of the implementation of the national values and principles of governance, providing its assessment on the realization of the national values and principles of governance.

The National Council on the Administration of Justice (NCAJ) on the other hand was instituted to help realize the principle of "democratic participation" or consultation. Section 34 (2) of the Judicial Service Act[80] establishes the Council as the highest decision-making organ of the NCAJ, chaired by the Chief Justice of Kenya and composed of: the heads of all justice sector agencies, senior representatives from ministries concerned with gender, women, children affairs as well as land and the environment, representation from civil society organisations working on human, gender and children rights and representation from the private sector. This spread of representation is also replicated at the Technical Committee level, as well as in the various working committees of the NCAJ. Section 35 (1) of the Judicial Service Act requires that the Council ensures a:

> *"...consultative approach in the administration of justice and reform of the justice system."*

Sen[redacted] NCAJ, a key informant to the present research, [redacted] noted that while values are not explicitly discussed at the NCAJ, there is nevertheless a genuine effort to ensure consultative and

[77] Also surveyed for the present research.
[78] KNCHR Act No. 14 of 2011 (Laws of Kenya). Available at: https://www.knchr.org/Portals/0/Articles/KenyaNationalCommissiononHumanRights_Act_No14of2011.pdf?ver=2016-08-01-132051-907 [Accessed 16 May 2021]
[79] Alternative to the President's report mandated by Article 132(c)(i) of the Constitution (See Chapter Three).
[80] No. 1 of 2011 (Laws of Kenya). Available at: http://kenyalaw.org/kl/fileadmin/pdfdownloads/Acts/Judicial_Service_Act_2011.pdf [Accessed 16 May 2021]

collective decision-making in practice. This observation further explains the high rating scored by the NCAJ, for the value of democracy.

5.1.2 Threats to Integrity in Kenya's Justice Sector

This section examines respondents' views on the key threats to integrity in Kenya's justice sector. In doing so, it sheds further light on the degree to which the core constitutional values have been assimilated at an organisational level. The section therefore seeks to confirm the findings on the values of transparency and accountability, which appear to lag behind the values of democracy and social justice. It also clarifies the gaps in "integrity" that pose the greatest danger to the administration of justice in Kenya.

The assessment of "key threats to integrity" was much like that of values carried out on two levels. First, an analysis of the computed variable of the correlated key threats,[81] was carried out, as well as of the individual threats of: (i) lack of, or insufficient transparency in decision-making, (ii) lack of, or insufficient accountability of superiors, (iii) lack of, or ineffective internal oversight mechanisms, (iv) lack of, or ineffective external oversight mechanisms, (v) lack of, or ineffective anti-corruption mechanisms and (vi) other threats. Respondents were asked to rate their "level of concern" on each on the computed and individual threats/variables on a 5 point scale ranging from "Not at all concerned" to "Extremely concerned".

The findings with respect to the key threats to integrity largely confirm the findings of the analysis of core values. In general terms, as shown in ***Table 10*** below, the agencies which scored well on the values such as NGOs / Independent bodies, and NCAJ Secretariat also had the least levels of concern with respect to the computed integrity threats. Conversely those that had low ratings for the values such as the Police (NPS) and Children's Department (DCS), also had the highest levels of concern with respect to the integrity threats. The notable departures were Probation (PACS) and the Prosecution (ODPP) which appeared to have inconsistent or conflicting findings with respect to the assimilation of values, and levels of concern with respect to the threats to integrity. While PACS respondents found that the values tended to be assimilated "Often", they nevertheless had a high median indicating "Extreme concern" for threats to integrity in their organisation. ODPP respondents reported that values tended to be adopted only "Sometimes" but nevertheless had a low median of 2.50 ("between Slightly and Somewhat concerned") with respect to the computed integrity threat.

[81] Determinant statistic, 0.025.

Table 10: Medians of Computed Integrity Threats

(1=Not at all concerned, 2=Slightly concerned, 3=Somewhat concerned, 4=Moderately concerned, 5=Extremely concerned)

	Agency	Computed Values
1.	Department of Children's Services **(DCS)**	3.50
2.	Non-Governmental Organisations **(NGOs)** / Independent Bodies	1.00*
3.	Ethics and Anti-Corruption Commission **(EACC)**	3.00
4.	Judiciary	3.50
5.	Kenya Prisons Service **(KPS)**	1.00*
6.	National Council on the Administration of Justice Secretariat **(NCAJ)**	1.50*
7.	National Police Service **(NPS)**	4.00
8.	Office of the Director of Public Prosecutions **(ODPP)**	2.50
9.	Probation and Aftercare Service **(PACS)**	4.50
10.	Witness Protection Agency **(WPA)**	3.00
	Overall median	**3.00**

(*=Extreme statistics)

It is also notable that none of the threats scored the highest median of "Extremely concerned". This seems to confirm the earlier finding that the national values had to some degree been assimilated into the institutional cultures of the individual agencies post the 2010 Constitution.

The survey responses to the integrity threat questions also confirmed that insufficient transparency in decision-making, and insufficient accountability lag behind other values, and are the greatest threats to integrity in the justice sector. ***Table 11*** below indicates that across all agencies, the respondents tended to be "Moderately concerned" with respect to the transparency and accountability threats while they were less concerned (between "Somewhat and moderately concerned") with respect to the threat of "Lack of, or ineffective internal oversight mechanisms". The lowest levels of concern ("Somewhat concerned"), were registered for the threats of: "Lack of, or ineffective external oversight mechanisms" and "Lack of, or ineffective anti-corruption mechanisms." These latter results can be explained by the existence of well established anti-corruption and external oversight mechanisms such as the Ethics and Anti-Corruption Commission (EACC).

Table 11: Medians of Individual Integrity Threats

(1=Not at all concerned, 2=Slightly concerned, 3=Somewhat concerned, 4=Moderately concerned, 5=Extremely concerned)

	Computed Integrity Threats	Lack of, or insufficient transparency in decision-making	Lack of, or insufficient accountability of superiors	Lack of, or ineffective internal oversight mechanisms	Lack of, or ineffective external oversight mechanisms	Lack of, or ineffective anti-corruption mechanisms
Overall median	**3.00**	**4.00***	**4.00***	**3.50**	**3.00**	**3.00**

(*=Extreme statistics)

Table 12 below further shows that the Children's Department (DCS), Judiciary, Police (NPS) and Probation (PACS) reported the highest median rating of 4 ("Moderately concerned"), for "insufficient accountability of superiors" as a threat to integrity.

Table 12: Medians of "Lack of, or Insufficient Accountability of Superiors"

(1=Not at all concerned, 2=Slightly concerned, 3=Somewhat concerned, 4=Moderately concerned, 5=Extremely concerned)

	Agency	Lack of, or insufficient accountability of superiors
1.	Department of Children's Services **(DCS)**	4.00*
2.	Non-Governmental Organisations **(NGOs)** / Independent Bodies	1.00*
3.	Ethics and Anti-Corruption Commission **(EACC)**	3.00
4.	Judiciary	4.00
5.	Kenya Prisons Service **(KPS)**	1.00*
6.	National Council on the Administration of Justice Secretariat **(NCAJ)**	2.00
7.	National Police Service **(NPS)**	4.00*
8.	Office of the Director of Public Prosecutions **(ODPP)**	3.00
9.	Probation and Aftercare Service **(PACS)**	4.00*
10.	Witness Protection Agency **(WPA)**	3.00
	Overall median	**4.00**

(*=Extreme statistics)

This variable adds a different dimension to the earlier assessment on institutional accountability – that is, the accountability of superiors, thus providing a more nuanced understanding of how

organisations assess institutional accountability. This may explain why while some agencies like PACS, the EACC and WPA, had earlier indicated a tendency towards the prevalence of accountability in their organisations, they nevertheless report higher levels of concern with respect to "accountability of superiors". This analysis therefore qualifies the findings of the previous analysis to confirm that it is the accountability of superiors rather than accountability in general, that may be at issue.

The survey data also suggests that while agencies which play an oversight role, such as NGOs / Independent bodies and the Ethics Commission (EACC), appear to have a higher assimilation of values, they struggle with respect to the threats of ineffective internal and external oversight mechanisms and anti-corruption mechanisms. In this regard, EACC reported the highest levels of concern for ineffective internal and external oversight mechanisms (median of 4.50) while NGOs / Independent bodies also scored a median of 4.50 for ineffective anti-corruption mechanisms as denoted by the shaded cells in ***Table 13*** below.

Table 13: Medians of Integrity Threats Related to Insufficient Oversight

(1=Not at all concerned, 2=Slightly concerned, 3=Somewhat concerned, 4=Moderately concerned, 5=Extremely concerned)

Agency	Lack of, or ineffective internal oversight mechanisms	Lack of, or ineffective external oversight mechanisms	Lack of, or ineffective anti-corruption mechanisms
DCS / Children's Department	4.00	2.00	3.00
NGOs / Independent bodies	1.00	4.00	4.50*
EACC / Ethics Commission	4.50*	4.50*	3.00
Judiciary	4.00	4.00	4.00
KPS / Prisons Service	2.00	1.00	1.00
NCAJ Secretariat	3.00	1.50	1.50
NPS / Police	4.50	4.00	4.50
ODPP / Prosecution	2.50	2.00	2.50
PACS / Probation	4.00	3.00	5.00
WPA / Witness Protection	3.00	3.00	3.00
Overall median	**3.50**	**3.00**	**3.00**

(*=Extreme statistics)

This suggests that while these agencies play a crucial role in checking abuses by the other national bodies, little attention is placed to their own oversight. This fact was confirmed by key

informant Exp-NGO/JUD/NCAJ who works closely with NGOs / Independent bodies and the EACC, within the context of the NCAJ, which the informant supports.

The only national agency that seems to consistently show higher assimilation of values,[82] and lower levels of concern for threats to integrity is the Prisons Service (KPS). KPS scored a median of 4 ("Often") for the computed values, and a median of 1 ("Not at all concerned") for the computed integrity threat variable.

To better understand the findings with respect to KPS which significantly departs from those of comparable national agencies such as the Police (NPS), an analysis of the variable on *"improvement of current employment"* was carried out.[83] In this analysis, respondents were asked to rate on a 7 point scale areas of their employment they would like to improve. KPS had the lowest median (1 "Not a priority) for the computed "improvement" variable. KPS also had a similar low rating for the individual variables of improvement of: (i) work culture, (ii) leadership culture, (iii) capacity building, (iv) communication and (v) "other" improvement. The only variables for improvement which KPS respondents scored high medians ("High priority") where: (i) better terms of service and (ii) improved infrastructure. KPS respondents therefore appear to have relatively high overall levels of satisfaction with their institution despite the apparent challenges in resources and facilitation. This data may therefore indicate that work culture and values may take precedence over resources in determining higher levels of satisfaction among staff under certain conditions. The discussion to follow interrogates how "lack of, or inadequate facilitation" among other operational factors, compare with respect to the delivery of justice.

5.1.3 Threats to the Delivery of Justice in Kenya's Justice Sector

This analysis was carried out to determine the perception of the respondents as to whether facilitation, or provision of the tools / support required to effectively execute their roles, or institutional values have greatest impact on the delivery of justice in Kenya. Respondents were asked to rate their "level of concern" for the computed[84] and individual threats to the delivery of justice i.e.: (i) ineffective operational mechanisms or working processes, (ii) ineffective

[82] As reflected in Table 9, KPS / Prisons had an overall median of 4 for the "computed values" variable. It had notably high scores for Social Justice and Accountability (median of 5). It also had a median of 3 for Transparency and Democracy – a result not unexpected for a member of disciplined forces that can be hierarchical and opaque in some of their operations.
[83] See Table 22 in Annex VII.
[84] Determinant statistic, 0.034 (greater than 0.00001).

leadership, (iii) inadequate facilitation e.g., transport and computers, (iv) inadequate interagency collaboration, (v) lack of, or insufficient transparency and accountability and (v) other threats.

The analysis of the threats to the delivery of justice reveals two key points. First, it suggests that while respondents believed that transparency and accountability were important values, and that lack thereof was a key threat to the integrity of their organisations, they did not believe that these values were as important as other variables such as "adequate facilitation", to the delivery of justice. ***Table 14*** below demonstrates that across all agencies, the threat to the delivery of justice with the highest median (5) for overall level of concern was "inadequate facilitation".[85] This was followed by "ineffective operational mechanisms (working processes)" and "inadequate interagency collaboration" (median of 4 each). "Ineffective leadership" and "lack of, or insufficient accountability and transparency" had the lowest median for level of concern – "Somewhat concerned".

Table 14: Medians of Threats to the Delivery of Justice

(1=Not at all concerned, 2=Slightly concerned, 3=Somewhat concerned, 4=Moderately concerned, 5=Extremely concerned)

	Computed Justice Threats	Ineffective operational mechanisms	Ineffective leadership	Inadequate facilitation e.g., transport / computers	Inadequate interagency collaboration	Lack of, or insufficient transparency and accountability
Overall Median	**3.50**	**4.00**	**3.00**	**5.00***	**4.00**	**3.00**

(*=Extreme statistics)

This finding appears to be supported by the observation with respect to the Prisons Service (KPS), which despite having a higher assimilation of values, and lower levels of concern regarding the threats to integrity, nevertheless reported a higher average for level of concern for inadequate facilitation as a threat to the delivery of justice (4 "Moderately concerned"). This data suggests that the higher adoption of values by an agency, or higher levels of

[85] This includes provision of transport and computers among other tools or facilities required for one to effectively function in their role.

satisfaction with the employer are ***not*** as important to the delivery of justice, as adequate facilitation.

This survey finding is supported by the PLEAD Baseline Study, which identified lack of adequate facilitation as a key challenge to justice sector organisations (UNODC 2018, p. 4). The study found that in general, there is poor investment in criminal justice agencies in Kenya, resulting in inefficiencies such as backlog of cases, leading to prison overcrowding because of the high remand populations (UNODC 2018, pp. 11-13). The study therefore recommended the purchase of vehicles for the Probation Service (PACS), and computers for the National Council (NCAJ), PACS and the Prosecution (ODPP) (UNODC 2018, p. 4).

The State of the Judiciary and the Administration of Justice Report (SOJAR 2018-2019), also noted that the Judiciary's budget was less than 1% of the national budget, while the international standards recommend 2.5% of the national budget (Judiciary of Kenya 2020(a), p. 262). The 2021 SOJAR Report indicated that this situation only become worse in the following fiscal year, as the budget deficit for the Judiciary increased from 27% in 2019/20 to 54% in 2020/21 (Judiciary of Kenya 2021[a], p. 194). Published data for the 2018/19 national budget indicates that while the Ministry of Interior was allocated over Kenya Shillings (KShs.) 126 billion, and the Ministry of Defence over KShs. 111 billion, the Judiciary was allocated approximately Kshs. 14.5 billion, while both ODPP and EACC were each allocated approximately KShs. 2.9 billion.[86] Other justice sector agencies such as the Witness Protection Agency (WPA) received far less at approximately KShs. 483 million. These disparities in resource allocation were also highlighted by the key informant expert on NGOs, the Judiciary and NCAJ (Exp-NGO/JUD/NCAJ).

The SOJAR report, and the 2016 Criminal Justice System Audit also described a similar resource strain in PACS, which has an ever increasing catalogue of mandates, without the financial or human resources to effectively carry out its functions (Judiciary of Kenya 2020(a), pp. 311-313; NCAJ 2016, p. 77). As a matter of fact, virtually all criminal justice agencies cite limited resources in their reports contained in the 2018/19 SOJAR report. These reports therefore appear to be consistent with the high levels of concern registered by justice sector actors, for inadequate facilitation as a major threat to the delivery of justice.

[86] See National Treasury website for the national budget 2018/19 here: https://www.treasury.go.ke/component/jdownloads/send/120-program-based-budgets/1222-programme-based-budget-2018-2019.html [Accessed 25 December 2020]

Two of the key informants interviewed, however, offered a divergent view with respect to the importance of values, in comparison to facilitation, for the delivery of justice. Exp-DCS/PACS and Exp-NPS/ODPP/WPA stated that values were just as important as facilitation, and foundational to the successful delivery of justice. Both experts held the view that the assimilation of values was important for the protection of the resources required to facilitate the delivery of justice.

Exp-NPS/ODPP/WPA further explained that the provision of operational mechanisms without first firmly establishing values would be counterproductive to the objectives of delivering justice. This view from the experts is not surprising given the role of development partners in promoting anti-corruption measures which are often a pre-condition to development and aid programmes.[87]

Exp-NGO/JUD/NCAJ however offered an alternative view which aligned more with the results of the survey of the national actors. The expert stated that facilitation and the adequate provision of resources rather than values, had the greater impact on the delivery of justice. Other threats to the delivery of justice identified by the survey respondents include: (i) personal attacks on justice sector actors, (ii) lack of concern for junior staff by management and (iii) lack of staff participation in policy-making. The third of these will be explored in greater depth in the next analysis.

5.1.4 Participatory Approach in Decision or Policy-Making in the Justice Sector

The assessment of "a participatory approach" in decision or policy-making and implementation was made on three levels, that is: (i) staff or respondent participation in decision or policy-making impacting on their institutions or agencies, (ii) criminal justice stakeholder participation in policy-making and implementation and (iii) public participation in policy-making. These variables can be seen as a proxy for the value of "democracy" also referred to as "participation of the people" in the 2010 Constitution. The present analysis is therefore expected to triangulate and expound on the findings of the analysis on the value of "democracy".

5.1.4.1 Analysis of Staff Participation in Policy-Making

An analysis of the survey data shows that according to the respondents, staff participation in decision and policy-making is crucial to the delivery of justice. The data shows that 77.2% of

[87] Note that the experts are employed by a development partner that works with criminal justice agencies.

all participants believed that staff participation in decision and policy-making enhances the delivery of justice, while 7% did not believe so, and 12.3% reported not to know if it does.

The participants provided a high median rating for the reasons why their participation would enhance the delivery of justice. ***Table 15*** shows that the respondents rated each of the reasons why their participation would be crucial, 6 ("True of me") on a 7 point scale. The respondents therefore overwhelmingly indicated that it is "True of them", that their participation would: (i) allow for the consideration of operational aspects that the management may not be aware of, (ii) be crucial to the implementation of decisions due to their current position, (iii) allow for the consideration of innovative solutions, (iv) allow for the consideration of legal and other impediments to the implementation of a decision or policy and that (v) it would enhance transparency and accountability.

Another reason provided by the respondents for the importance of staff participation in policy-making is that, it would also enable the staff member to ensure that their clients are kept informed on the evolving best practice and legal context of their area of work.

While it can be argued that the respondents' assessment of their importance in policy making is prone to bias, it is nevertheless notable that the surveyed justice sector actors see themselves as a critical players in decision and policy making, and therefore the success of the justice sector initiatives.

Table 15: Medians of How Staff Participation Enhances the Delivery of Justice

(1=Very untrue of me, 2=Untrue of me, 3=Somewhat untrue of me, 4=Neutral, 5=Somewhat true of me, 6=true of me, 7=Very true of me)

	My Participation Allows for consideration of operational aspects	My Participation is Crucial to implementation of decisions/policies due to position	My Participation Allows for consideration of innovative solutions	My Participation is Crucial for the consideration of legal or other impediments	My Participation Enhances transparency and accountability	Other Reasons
Overall Median	**6.00***	**6.00***	**6.00***	**6.00***	**6.00***	**1.00**

(*=Extreme statistics)

Table 16 below shows that across all criminal justice agencies, the respondents tend to participate "Sometimes" in decision-making "*impacting their institutions or agencies"*. The agencies with the highest median score were NGOs / Independent bodies, the National Council Secretariat (NCAJ) and the Witness Protection Agency (WPA). The data shows that the tendency for these agencies was for staff to participate "Often" in decision or policy making impacting their institutions. The lowest scoring agencies were the Children's Department (DCS) and the Police (NPS). DCS respondents indicated that they only participated "Rarely" in decision-making impacting the institution, while NPS respondents indicated that they tend to participate between "Rarely and Sometimes".

Table 16: Medians of "Staff Participation in Policy-Making Impacting on Institution" and Medians of "Democracy and Participation of the People"

(1=Never, 2=Rarely, 3=Sometimes, 4=Often, 5=Always)

	Agency	Staff Participation in Policy Making Impacting the Institution	Democracy or Participation of the People
1.	DCS / Children's Department	2.00*	3.00
2.	NGOs / Independent bodies	4.00*	4.00
3.	EACC / Ethics Commission	3.00	4.00
4.	Judiciary	3.00	4.00
5.	KPS / Prisons Service	3.00	3.00
6.	NCAJ Secretariat	4.00*	5.00
7.	NPS / Police	2.50*	3.00
8.	ODPP / Prosecution	3.00	3.00
9.	PACS / Probation	3.00	4.00
10.	WPA / Witness Protection	4.00*	4.50
	Overall median	**3.00**	**4.00**

(*=Extreme statistics)

Table 16 (above) also compares the median ratings for "staff participation in policy-making impacting the institution" with those of "democracy or participation of the people". Both variables are measured using the same 5 point scale ranging from "Never" to "Always."

The data shows consistency in the medians of the two variables, so that agencies such as DCS and NPS, which scored the lowest medians for staff participation also scored the lowest

medians for the democracy variable. Conversely agencies such as NGOs / Independent bodies, NCAJ and WPA which had the highest scores for staff participation, similarly scored the highest medians for the democracy variable. This serves as further confirmation of the findings that DCS and NPS appear to be the least democratic in their policy-making processes, while NGOs, NCAJ and WPA are the more democratic agencies.

The data also shows that while staff participation in decision-making impacting on the institution tends to occur "Sometimes" across all agencies, this flexibility generally applies to ***departmental*** rather than organisational decision-making. To provide further insight to this question, respondents were asked to rate statements which described the bureaucratic structures of their respective agencies.

Table 17 below illustrates the bureaucratic structures and their respective median ratings by all the respondents on a 7 point scale ranging from "Never true" to "Always true".

Table 17: Medians of Bureaucratic Structures

(1=Never true, 2=Rarely true, 3=Sometimes but infrequently true, 4=Neutral, 5=Sometimes, 6=Usually true, 7=Always true)

AGENCY	ALL decisions have to be made through lengthy bureaucratic process involving the highest management levels	I or my superior have SOME flexibility in making decisions that impact on our department	I or my superior have SIGNIFICANT flexibility in making decisions that impact on our department	I or my superior have SOME flexibility in making decisions that impact on THE AGENCY AS A WHOLE	I or my superior have SIGNIFICANT flexibility in making decisions that impact on THE AGENCY AS A WHOLE
DCS / Children's Department	5.50	5.50	3.00	3.00	3.00
NGOs	2.00	6.00	6.00	6.00	6.00
EACC / Ethics Commission	6.00	5.00	5.00	2.00	2.00
Judiciary	5.00	5.00	4.00	4.00	3.00
KPS / Prisons	5.50	3.00	5.00	4.50	4.00
NCAJ Secretariat	1.50	5.50	5.00	4.00	4.00

NPS / Police	6.50	5.50	5.50	4.00	4.50
ODPP / Prosecution	6.00	2.00	2.00	2.00	2.00
PACS / Probation	7.00*	3.00	1.00*	4.00	3.00
WPA / Witness Protection	3.00	5.00	4.00	5.50	3.50
Total	**5.00***	**5.00***	**5.00***	**4.00**	**3.00***

(*=Extreme statistics)

However, the respondents tended to be "Neutral" (4) on "I or my superior have ***some flexibility*** on making decisions that impact on our ***organisation as a whole***". The remaining bureaucratic structure, which is also the least bureaucratic structure had the lowest median of 3 ("Sometimes but infrequently true") i.e.: "I or my superior have ***significant flexibility*** in making decisions that impact on our ***organisation as a whole***."

This data clarifies that staff participation in decision or policy-making impacting on the institution or agency, is more likely to occur with respect to decisions or policies impacting the ***staff member's department***, rather than the organisation as a whole.

The expert on the Probation Service (Exp-DCS/PACS) explained that in the case of the PACS, this silo approach can be attributed to inefficient coordination by management, and competition between departments and individual staff members. The expert noted that the impact of this approach has been the lack of a well-informed employee base as information is not effectively disseminated from headquarters to the regions. The expert also noted that it results in duplication of work as departments are not aware of what their counterparts are doing. Another negative impact identified by the expert is that it affects coordinated reporting, and results in lack of visibility of the departmental achievements, which ultimately impacts on the morale of employees.

Exp-ODPP/NPS/WPA noted that in the case of the Prosecution (ODPP), this silo approach has also resulted in the duplication of interventions and support provided by development partners. The expert noted that decisions are often made by persons aligned with superiors without engaging members of staff despite the availability of structures that would require participatory decision-making. The expert noted that in the case of ODPP, the fact that all communication and decisions have to be channeled through the office of the Chief of Staff, also results in some inefficiency. The expert noted that the result has been that critical communication and decisions

often do not reach other departments. Exp-ODPP/NPS/WPA however noted that in the case of the Police (NPS), there is slightly better coordination of decision-making through weekly interdepartmental meetings.

The finding that staff members are more likely to participate in departmental rather than institutional decision-making therefore points to a disconnect in policy-making and implementation, as departmental decisions or policies ultimately impact on the organisation as a whole. Human resource decisions will invariably impact on the workload that other departments can take on. Finance decisions also impact on the core functions of a criminal justice agency, such as witness protection with respect to the WPA, due to the allocation of resources. The implication is that organizational polices on staff participation in decision-making should take into account that departmental actions will impact on the organisational outputs. This means that organisations should reframe their decision-making process to ensure that staff members are engaged in cross-cutting decision-making, and not confined to decision-making impacting their respective departments.

The next assessments will examine criminal justice stakeholder and public participation, as a further indication of the assimilation of the value of "democracy" in organisational policy-making.

5.1.4.2 Analysis of Justice Sector Stakeholder Collaboration in Policy-Making

An analysis of survey data confirms the importance of interagency collaboration among Kenyan criminal justice agencies. Indeed, the perception among respondents is that criminal justice stakeholder participation in decision or policy-making, is even more important than the participation of every staff member in decision or policy-making. The survey indicates that 87.7% of the respondents believe that stakeholder participation in policy-making enhances the delivery of justice. ***Table 18*** below also shows that the stakeholder participation is in reality, more prevalent than staff participation in decision or policy-making.

Across all agencies, the overall median rating for the question whether the respondent's agency collaborates with other criminal justice actors in policy-making was 4 ("Often"). NGOs / Independent bodies, the Prisons Service (KPS) and NCAJ Secretariat reported the highest median of 5 ("Always") for stakeholder collaboration.[88] All the other agencies scored a median of 4 for criminal justice stakeholder collaboration.

[88] NCAJ respondents had the least variation in their responses (IQR=4.25-5).

Table 18: Medians of Criminal Justice Stakeholder Participation in Policy-Making

(1=Never, 2=Rarely, 3=Sometimes, 4=Often, 5=Always)

Agency	Criminal justice stakeholder Participation
Department of Children's Services (DCS)	4.00
NGOs / Independent bodies	5.00*
Ethics and Anti-Corruption Commission (EACC)	4.00
Judiciary	4.00
Kenya Prisons Service (KPS)	5.00*
NCAJ Secretariat	5.00*
National Police Service (NPS)	4.00
Office of the Director of Public Prosecutions (ODPP)	4.00
Probation and Aftercare Service (PACS)	4.00
Witness Protection Agency (WPA)	4.00
Overall median	**4.00**

(*=Extreme statistics)

However, the survey data also serves to highlight that not all the agencies (in practice), are perceived to have the same level of importance with respect to their centrality in the administration of justice. Some agencies such as the Judiciary, Police (NPS) and Prosecution (ODPP), seem to be more core or central to the administration of justice. This finding is based on the respondents' rating of: (i) the number of an institution's interagency collaborators, (ii) the desire to collaborate a given institution, and (iii) the processes with the greatest intensity of collaborations. On the other hand, the data shows that other criminal justice agencies such as Probation (PACS), Witness Protection Agency (WPA) and the Children's Department (DCS) are perceived, sometimes even by their own respondents to play a more supporting or subordinate role.

The survey data on collaborative networks between criminal justice agencies indicates that the agencies with the largest number of collaborations were: ODPP (91.6% of the respondents),[89] Judiciary (86.6%), NPS (85.1%) and the KPS (80.4%). On the other hand, the agencies with

[89] Ninety-one point six per cent (91.6%) of the respondents indicated "Yes" for collaboration with ODPP.

the lowest number of collaborations were: EACC (66.6%), WPA (68.8%), PACS (75%) and DCS (77%).[90]

To the question whether it is desirable for the respondents' agencies to collaborate with the other criminal justice agencies, the overall median was 5, on a 5 point scale ("Very desirable"). This observation is consistent with previous findings on the importance of interagency collaboration. The agencies found to be most desirable to collaborate with (median of 5 "Very Desirable") are: ODPP (83.7% of the respondents indicated a desire to collaborate more with the body), NPS (83.3%) and Judiciary (81.3%).

However, when one considers those with the highest cumulative percentage for both "Very desirable" and "Desirable", the Ethics Commission (EACC) is included among the top contenders with 89.6% of the respondents indicating a desire to collaborate with the body. This places the EACC ahead of the Police (NPS) which scored a cumulative percentage of 87.5%, almost on a par with the Judiciary at 89.6%, and the Prosecution (ODPP) at 89.8%.

It is notable that the most desirable agencies to collaborate with are also largely the agencies with the most collaborations in the previous analysis. It is therefore reasonable to conclude that these organisations, which largely intersect in the execution of court or trial functions, are at the center of the formal criminal justice system by virtue of their roles, and importance in the everyday administration of justice. These findings confirm the previous conclusion on the centrality and importance of ODPP, the Judiciary and NPS to the functioning of the formal criminal justice system. The only departure in both cases is the EACC, which in the previous analysis had the fewest number of collaborations but a high (cumulative) desirability for collaboration. This later observation may indicate a latent desire for greater external accountability, or for guidance on matters related to ethics through greater engagement of the ethics and anti-corruption body. This observation is also consistent with the previous findings on the need for greater focus on accountability, which along with transparency lags behind the other values. Probation (PACS), the Children's Department (DCS) and the Witness Protection Agency (WPA), had the lowest percentages, which were nevertheless high, for desirability of collaboration (83.4%, 83.7%, 85.4% respectively).

To confirm the finding that certain processes have a greater role to play in determining the centrality of an institution in the administration of justice, the respondents were asked to rate

[90] Collaborations with NCAJ and NGOs / Independent bodies, were not included for the reasons that the NCAJ was established with the specific mandate to coordinate interagency collaboration. NGOs were not included for the reason that they are not nationally mandated criminal justice actors, hence there is generally no obligation on other agencies to collaborate with them.

the degree to which they collaborate on various processes, with other criminal justice agencies. ***Table 19*** below shows that the working processes with the highest median of 5 ("Always") for interagency collaboration are: (i) court processes, (ii) management of vulnerable groups such as children and (iii) administrative processes such as verification and processing of documents. In this regard, the highest agreement was with regard to court processes.[91] This was followed by management of victims and witnesses and human rights/oversight matters which had a median of 4 ("Often") each. Arrest and investigation received the lowest rating for collaborative processes (3 "Sometimes"). This may be because this function is specialized to the Police (NPS) as a core function of their work.

Table 19: Medians of Collaboration on Process

(1=Never, 2=Rarely, 3=Sometimes, 4=Often, 5=Always)

	Arrest and investigation	Court processes	Management of witnesses or victims	Management of vulnerable groups e.g., Children	Administrative processes	Oversight and human rights matters
Overall median	**3.00***	**5.00***	**4.00**	**5.00***	**5.00***	**4.00**

(*=Extreme statistics)

However, the high collaboration connections and the high desirability of collaboration with NPS may be explained by the fact that the NPS is involved in a broad spectrum criminal justice processes.

The finding on the importance of court processes is consistent with the finding that the Prosecution (ODPP), the Judiciary and the Police (NPS) are among the most important players at the center the criminal justice system as they are at the center of court processes. This data therefore confirms that the court is the arena around which the administration of formal justice revolves or intensifies. This observation on the centrality of court processes informs the discussion later in this chapter, and subsequently in Chapter Six, on interagency electronic case management as a key mechanism for justice sector coordination.

This perception is nevertheless contradicted by the three national experts (Exp-DCS/PACS, Exp-ODPP/NPS/WPA and Exp-NGO/JUD/NCAJ), who all held the opinion that no agency is more core than another as they all rely on each other to play their roles in the delivery of justice.

[91] IQR=4.75-5

Exp-ODPP/NPS/WPA added that this was particularly so as current efforts, by both the governmental and non-governmental bodies are geared towards diverting offenders from the courts and formal justice system towards Alternative Dispute Resolution (ADR) and Alternative Justice Systems (AJS).[92] In fact a key step in this direction was the launch of the AJS Policy,[93] on 27 August 2020 by the Chief Justice of Kenya. A key motivation for operationalizing these traditional or customary forms of justice in Kenya, was the constitutional imperative[94] that alternative forms of dispute resolution be promoted as a direct expression of the constitutional stipulation that all judicial authority derives from the people. This effort therefore sought to mainstream community driven forms of justice, which are more accessible to majority of Kenyans.[95] Traditional justice systems are also seen to promote the autonomy of the people, and allow them greater participation in the resolution of their disputes.[96] AJS is also being promoted as a strategy towards reduction of prison overcrowding, and to ease pressure on the formal justice system.[97]

It is also notable that while the management of victims, witnesses and vulnerable groups processes received high ratings for collaboration on process, yet the agencies charged with these functions as their core mandate, i.e., Probation (PACS), Children's Department (DCS) and the Witness Protection Agency (WPA) received amongst the lowest ratings for collaboration, as well as desirability for collaboration. This may indicate that though the roles of the agencies are considered to be important, they have low visibility within the sector, which impacts on their perceived relevance in the sector.

This perception is confirmed by the PLEAD Baseline Study which documents that WPA and PACS both suffer from low public awareness (UNODC 2018, pp. 32, 34). In the case of WPA, low visibility is attributed in the study to the lack of decentralization of their activities to the counties due to lack of sufficient resources (UNODC 2018, p. 32). The 2016 Criminal Justice Audit Report also notes that in the case of PACS, limited resources have impacted training, and other capacitation such as vehicles which would allow them to do their work (NCAJ 2016, p. 77).

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[92] See the Speech of the Chief Justice Hon. David Maraga here: https://ajskenya.or.ke/download/chief-justice-david-maragas-speech-at-the-ajs-launch-on-27th-august-2020/ [Accessed on 23 November 2020]
[93] See AJS Framework Policy here: https://ajskenya.or.ke/download/alternative-justice-systems-framework-policy/ [Accessed on 23 November 2020]
[94] Article 159 (2)(c) 2010 Constitution.
[95] See press releases here: https://www.unodc.org/easternafrica/en/Stories/partners-welcome-move-to-mainstream-alternative-justice-systems-in-kenya.html; https://ajskenya.or ke/2020/08/29/maraga-roots-for-traditional-justice-as-he-prepares-to-digitise-courts/ [Accessed on 23 November 2020]
[96] Supra. AJS Policy, p. 4
[97] Supra.

Exp-ODPP/NPS/WPA noted that with respect to the Witness Protection Agency (WPA), emphasis on their covert nature / operations is also to blame for their lack of visibility. The expert noted that this approach has been counterproductive for the agency, as it has meant that their important role in providing a crucial service to the public has often been overlooked. The expert however noted that in recent years this WPA position has been shifting as they have been producing and publishing informational material on their agency.

Exp-DCS/PACS explained that that with respect to Probation (PACS), in addition to poor internal coordination, the low visibility of the agency can be explained by the fact that the government does not place significant value on the work of PACS. Exp-DCS/PACS notes that this is demonstrated by the fact that the agency has historically not been placed in the right Ministry (which would enhance its visibility),[98] with the result that its role is not fully understood or appreciated by its stakeholders.

Exp-DCS/PACS also challenges the notion that resources are the key to enhancing visibility noting that both PACS and the Children's Department (DCS) do not adequately use the resources available to them to enhance their visibility such as public meetings, or the media. The expert however noted that DCS did not suffer from a lack of visibility in the same way as PACS, as they are well known due to their work with children. Exp-DCS/PACS stated in the case of DCS, the challenge has been the general lack of capacity of the children officers, and a lack of understanding of their role and mandate.

This latter perception is somewhat supported by the survey data which shows higher levels of collaboration in the management of vulnerable groups such as children. Nevertheless the 2016 Criminal Justice System Audit indicates that this level of collaboration has not been optimal noting that:

> *"The Juvenile Justice System has not yet attained the cohesiveness, visibility and accessibility required to ensure access to justice to children when they come into contact with the Justice system." (NCAJ 2016, p. 78).*

The report goes on to recommend a multi-sectoral approach on youth justice matters (NCAJ 2016, p. 156). Among the measures adopted by the justice sector to address the coordination

[98] The Probation Service (PACS) is currently placed in the Ministry of Interior and Coordination of National Government. This ministry also houses the Police, Prisons, and many other bodies which arguably further limits the visibility of PACS. There are disparate views as to whether the agency should remain independent like ODPP, or be housed by another ministry more closely aligned to its role such as the Ministry of Justice.

gap in the management of children, has been the adoption of various electronic case management tools which shall be discussed later in this chapter.

5.1.4.3 Analysis of Public Participation in Policy-Making

The formal justice system also aspires to put people or "court users" (as opposed to institutions or agencies), at the center of the justice processes. Ostrom identifies "procedural satisfaction" as one of the key areas of performance measurement for courts. He describes procedural satisfaction as:

> *...the extent to which court customers perceive the court as providing fair and accessible service to all who enter the courthouse doors. A court enhances court users' perceptions of fairness by being responsive to the individual needs and characteristics of each case and customer.*[99] (Ostrom 2010, p. 45)

The first pillar of the JTF includes "people centered delivery of justice" (Judiciary of Kenya 2012, pp. 3, 13-18). This goes to show that even though certain bodies in the court process are considered dominant players in the administration of justice, the focus of justice should nevertheless remain on the "people" at the center of the justice process.

One way of ensuring that the system is focused on the justice needs of court users, is to involve the public in the policy-making process. The analysis of the data on public participation demonstrates that the public are considered to be less important than criminal justice stakeholders in the policy process.

Table 20 below shows that across all criminal justice agencies, the median for public participation in policy-making was 3 ("Sometimes"). This observation is similar to that of staff participation. It therefore appears that staff and public participation in policy-making, trail behind stakeholder engagement in terms of level of importance. The NCAJ Secretariat had the highest median for public participation in policy-making, as was the case for stakeholder collaboration. These observations are not surprising as the NCAJ is the overarching body instituted for the key purpose of coordinating policy formulation, for the criminal justice sector in Kenya (UNODC 2018, p. 36). In this regard, public (and stakeholder) engagement is largely effected through the Court Users' Committees (CUCs). The Children's Department (DCS) had

[99] Emphasis in the original.

the lowest median (2 "Rarely") for public participation in policy-making. DCS was followed by the Judiciary and the Police (NPS) (3 "Sometimes").

Table 20: Medians of Public Participation in Policy-Making

(1=Never, 2=Rarely, 3=Sometimes, 4=Often, 5=Always)

Agency	Public participation in policy-making
DCS / Children's Department	2.00*
NGOs / Independent bodies	4.00
EACC / Ethics	4.00
Judiciary	3.00
KPS / Prisons	4.00
NCAJ Secretariat	5.00*
NPS / Police	3.00
ODPP / Prosecution	3.50
PACS / Probation	4.00
WPA / Witness Protection	3.50
Overall median	**3.00**

(*=Extreme statistics)

To the question whether public participation enhances the delivery of justice, 80.7% of those surveyed responded positively, that is, it ***does*** enhance the delivery of justice. Approximately 7% either believed that it did not enhance the delivery of justice, or did not know whether it did.

Table 21 indicates that the leading reason why public participation is perceived to enhance the delivery of justice is, "it helps us understand our client better" (7 "Always true"). All the other reasons as to why public participation enhances the delivery of justice scored a median of 6 ("Usually true") that is: (i) it helps us understand the issues better, (ii) it facilitates "buy-in" of the management of the institutions, (iii) it ensures accountability / oversight, and (iv) it ensures public cooperation in implementation of policies.

Table 21: Medians of How Public Participation in Policy-Making Enhances Justice

(1=Never true, 2=Rarely true, 3=Sometimes but infrequently true, 4=Neutral, 5=Sometimes, 6=Usually true, 7=Always true)

Agency	Helps us understand the issues better	Helps us understand our client better	Helps create "buy in" with management	Ensures accountability / oversight	Ensures public cooperation in implementation of policies
Total	**6.00**	**7.00***	**6.00**	**6.00**	**6.00**

(*=Extreme statistics)

"Other" reasons provided for why public participation enhances the delivery of justice include that it:

> *"facilitates future informed programming"* and *"the public identifies gaps in programming hence management will look for appropriate solutions."*

These latter observations reveal that the public are objectively able to do what the other stakeholders are not in a position to – that is help shape interventions by providing crucial feedback on what works, and what does not work, in the implementation of policies. Exp-NGO/JUD/NCAJ noted that the Court Users' Committees (CUCs) within the NCAJ structure are particularly helpful mechanisms for providing such feedback through public participation.

5.1.4.4 Conclusion on Participatory Approach

In summary, all the components of a "participatory approach" – that is staff, criminal justice stakeholder and public participation – are observed to be key to policy formulation and decision-making, and the delivery of justice. This finding underlines the importance of the NCAJ as the body responsible for the coordination of the entire justice sector in policy-making, particularly in facilitating stakeholder participation, and public participation through the CUC mechanism. However, the PLEAD Baseline Study found that there has been limited coordination among criminal justice institutions, largely attributable to the fact that the NCAJ is not fully operational and is severely lacking in human resources (UNODC 2018, pp. 11, 36-37). This was confirmed by Sen [redacted] NCAJ, [redacted] who noted that among the key challenges facing the NCAJ is a skeletal Secretariat, poor resourcing, and over-reliance on donor funding. These structural and resourcing impediments to the operations of NCAJ ought to be addressed to further enhance interagency

collaboration. The role of the NCAJ as a coordination mechanism shall come into sharper focus later in this chapter, particularly in considering its contribution in the aftermath of the COVID-19 pandemic. A key question which this thesis turns to next, is the role that technology can play in enhancing interagency collaboration.

5.2 Analysis of the Role of Technology in the Administration of Justice

This section examines the role that technology plays in the administration of justice in Kenya. It commences by examining the cross-cutting technological goals of the justice sector set out in some of their strategic plans and ICT blueprints, and the intersection of these goals, with the constitutional values of democracy or participation of the people, transparency, and accountability.

These objectives shall be examined against the survey data which provides insights into: the technology available to the respondents in their functional roles, and the role of technology in entrenching the constitutional values discussed in this thesis, towards the goal of establishing an open access justice system. Once again and in summary, these values include; transparency, accountability, participation (and by extension interagency coordination), and social justice. Particular attention shall be given to the role of agency and interagency electronic case and records management system in advancing these values. This shall be done in setting the groundwork for the discussion Chapter Six, on the added value of blockchain-based case management systems. The section will also focus on the factors which have led to either the success or failure in the adoption of technology within the justice sector. This discussion will however commence with an examination of the regulatory and policy frameworks that have enabled the adoption of technology in Kenya's public service, and in the criminal justice sector.

5.2.1 ICT, E-Governance and E-Justice Policy Landscape in Kenya

Cordella and Contini note that *"e-justice reforms do not occur in an institutional and technological vacuum"* (Cordella and Contini 2020, p. 3). They therefore propose that prior to any adoption of technology in the justice context, the unique e-government technological landscape should be considered, as it frames the technological standards, architecture and functionalities that can be leveraged in implementing the project (Cordella and Contini 2020, pp. 3-4).

Kenya has a robust policy and strategy framework for enabling the adoption of technology within its governance structure, dating from 2004 when the Office of the President published the country's first e-government strategic plan which articulated among other objectives, a plan to automate and integrate its processes (Cabinet Office 2004, p. 1).[100] The Communications Authority of Kenya then launched the ICT Policy Sector Guidelines, in March of 2006.[101] In 2007, Kenya launched its national long-term development blue-print – Kenya Vision 2030 (GOK 2007, pp. viii, 20-21).[102] The goals and strategy for e-government in Kenya were further elaborated in the National ICT Master Plan published by the ICT Authority of Kenya in 2014. [103] Other national agencies also adopted ICT master plans to guide their own technological adoption.[104] In 2014, the Ministry of Finance launched the first e-government platform for Kenya – *eCitizen*, which was then managed by the ICT Authority of Kenya.[105]

In 2019, the Ministry of ICT oversaw the review of the 2006 National ICT Policy, in which the government first took official notice of blockchain among other emerging technologies, and indicated its intention to provide for a legal framework and technical support for the use of blockchain in securing records of transactions (Ministry of ICT 2019[a], pp. 4-9). In July of 2019, the Ministry of ICT published the findings of an exploratory study on the potential uses cases and benefits of emerging technologies such as blockchain and AI in Kenya's public sector (Ministry of ICT 2019[b], pp. 11-21). Some of the benefits of blockchain identified in the report include its application in the fight against corruption due to its transparency and accountability, election strengthening, enhanced public service delivery, among other use-cases (Ministry of ICT 2019[b], pp. 11-21). The report noted that blockchain could enhance some of the forgoing processes e.g. by providing a single "source of truth" for all government services, implementation of a digital identity service, and the reduction of "transaction costs" due to enhanced institutional efficiency and greater resilience towards cyber-attacks (Ministry of ICT

[100] The overall goal of e-government according to the Plan is to, *"…make Government more result oriented, efficient and citizen centered*. The Plan projected that by 2007 the government would have automated and integrated its records, such as: its registration of persons databases (e.g. births, deaths etc.), its taxation databases, as well as property and assets records.

[101] See website here: https://ca.go ke/document/the-ict-sector-policy-guidelines-of-march-2006/ [Accessed 17 December 2020]

[102] In the blue-print, science, technology and innovation were promoted as important drivers of wealth creation, social welfare and international competition.

[103] See the Masterplan here: https://www.ict.go ke/wp-content/uploads/2016/04/The-National-ICT-Masterplan.pdf [Accessed 17 December 2020]

[104] Within the criminal justice sector, the Judiciary pioneered this trend by adopting its own ICT strategy laid out in its ICT Policy (2018), and ICT Master Plan (2018-2022).

[105] See background information here: https://ag.ecitizen.go ke/index.php?id=4 [Accessed 17 December 2020]. This portal, which is still in use today by citizens and foreign nationals, offers numerous online services such as business registration, notice of marriage, land searches, driving license applications, taxation services among many others.

2019[b], pp. 11-21). The report also noted the risks and challenges associated with the technology (Ministry of ICT 2019[b], pp. 11-21).

The Kenya National Digital Master Plan (2022-2023) endorsed the exploratory study's findings and use-case recommendations for Digital Ledger Technologies (DLTs), including blockchain.[106] It also outlined the goal of establishing Kenya as "a leader in emerging technology adoption, localization, and utilization for development".[107] In this regard, the master plan identified the deployment of blockchain for tracking of assets, transactions and legal documents, and establishing the required enabling frameworks as some of the key projects towards achieving its strategy of expanding e-government services.[108] However neither the study or digital masterplan identify any direct benefits of blockchain technology to the criminal justice sector.[109] These are considered in Chapter Six to follow.

Kenyan criminal justice agencies also recognize the importance of technology in enhancing efficiency, transparency, and accountability in the delivery of justice (Judiciary of Kenya 2020(a), p. 251). Many of their Strategic Plans and ICT blueprints, such as the Judiciary's Sustaining Judiciary Transformation agenda [SJT] (Judiciary of Kenya, 2017) and now the Social Transformation Through Access to Justice [STAJ] (Judiciary of Kenya, 2021[b]), make provision for the deployment of technology towards these goals. The Judiciary Transformation Framework [JTF], which preceded the SJT established *"harnessing technology as an enabler of justice"* as one of the four pillars of judicial transformation in Kenya (Judiciary of Kenya 2012, pp. 3, 13-18).[110]

The Judiciary, which has been the sector leader in this sphere, also clearly sets out elaborate ICT goals in its 2020-2023 Strategic Plan which include the adoption of emerging technologies, including a case management system that can improve the integration and automation of court processes and:

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[106] See Digital Master Plan at p. 73: https://cms.icta.go.ke/sites/default/files/2022-04/Kenya%20Digital%20Masterplan%202022-2032%20Online%20Version.pdf [Accessed 1 August 2022]
[107] *Supra*. p. 127
[108] *Supra.*
[109] It should be noted that in terms of justice sector awareness, only 38.6% of the justice sector actors surveyed for this research, indicated they had heard of blockchain technology. Of these, 50% were able to provide an accurate definition or description of the technology. Yet 31.6% of respondents believed that the blockchain would enhance integrity and efficiency in the delivery of justice.
[110] The other three (3) pillars are: (i) people centered delivery of justice, (ii) transformational leadership, organisational culture, and professional and motivated staff and, (iii) adequate financial resources and physical infrastructure.

> *"...enhance efficiency integrity of the processes and records as well as ensure accountability in creating, storing, retrieving, use of archiving and disposal of records."* (Judiciary of Kenya 2020(b), p. 58)

The contribution of technology in enhancing the integrity of justice sector institutions is acknowledged in the 2020/21 SOJAR Report. The report partly attributes the decrease of complaints about cash bail refunds from 45% to 32% in 2019/21 and 2020/21 respectively, to the automation of the administration of bail (Judiciary of Kenya 2021[a], pp. 154, 155).

The Judiciary further sets out its goal of integrating ICT solutions that are citizen focused, mobile friendly, convenient, and accessible (Judiciary of Kenya 2020(a), p. 251). The Prosecution (ODPP) sets out its fifth strategic objective as modernizing its case and records management, as well as procurement processes and procedures (ODPP 2016, pp. 34-35). In the same vein, the Ethics Commission (EACC) seeks to develop a robust network and communication infrastructure, as well as automate its processes (EACC 2018, p. 29). The Police (NPS) also list implementing integrated and networked management systems as one of their strategic goals (NPS 2018, pp. 9-10).

The survey data discussed below shows that prior to the COVID-19 pandemic, most criminal justice institutions had not made much progress in the advancement of their technological goals, particularly in the implementation of integrated case management systems.

5.2.2 Impediments to the Attainment of Technological Goals

At an institutional level, the key challenges identified to the realization of the ICT goals outlined above are largely threefold: (i) limited funding even for basic internet services (ii) over-reliance on donor funded Information Technology (IT) programmers or consultants and (iii) lack of the legislative and policy infrastructure to support technological adoption in the administration of justice (Judiciary of Kenya 2020(a), p. 259).

Respondents to the survey indicated that the leading reason that technology failed was the unreliable or unaffordable internet services. Children's Department (DCS) respondents in particular attributed unreliable internet to a failed attempt to introduce official email. Judiciary respondents also noted that unreliable internet was to blame for a failed attempt to introduce a case tracking system, as did a Police (NPS) respondent.

SenJud-ICT, a [redacted] key informant interviewed for the present research also highlighted the challenges presented by unreliable internet connectivity. He noted

that the scaling-up of virtual hearings during the COVID-19 pandemic was significantly impeded by the lack of internet connectivity in various justice sector institutions. He noted that while 85% of court stations have internet connectivity, the police stations and prisons have virtually no connectivity, which has meant that the Judiciary has had to subsidize these agencies to enable the virtual hearings to proceed. This in turn creates legitimate concerns with respect to the value of institutional independence.

The 2016 Criminal Justice System Audit, and the 2019 JJIMS Needs Assessment and Systems Audit confirm these survey and interview findings. The 2016 Audit found that for a number of justice sector institutions, such as the Judiciary, the Prosecution (ODPP), and Probation (PACS), the failure to adequately deploy ICT and in particular case and information management systems, as well as internet connectivity challenges have greatly hampered efficiency in the sector (NCAJ 2016, pp. 68, 75, 77; NCAJ 2019, p. 4, 5, 22).

Another leading reason for the failure of technology was the inability or failure of the supplier of the technology to complete or properly perform their task, such as, ensuring that the technology is user friendly, or fit for purpose. This was the case for the Witness Protection Agency (WPA), and for an NGO that attempted to introduce an online programmes management tool. In 2014, Probation (PACS), also rolled out an Offenders Records Management System (ORMS) supported by the World Bank (NCAJ 2019, p. 20). The system provided real-time reports that were supportive of decision making, but failed due to lack of sustainable internet connectivity and the underlying technology becoming obsolete (NCAJ 2019, p. 5, 20).

SenJud-ICT [redacted] also noted that the Judiciary had found the use of external donor funded consultants to be unsustainable in the development of case management software, as previous attempts to engage such consultants stalled once the donor assistance ended. Desk research confirmed the development of a multiplicity and often disjointed case management systems in the juvenile justice space. In the 1990's the German Technical Cooperation (GTZ)[111] made the first attempt to develop a national child protection database (NCAJ 2019, p. 4). This effort however failed due to workflow challenges resulting from the reliance on diskettes that had to be physically couriered to the Children's Department offices (NCAJ 2019, p. 4). The United Nations Children's Fund (UNICEF) and Save the Children then developed an inter-agency child protection database to track children who had been displaced as a result of the 2007 post-election violence in Kenya (NCAJ 2019, p. 4).

[111] Now referred to as the German Society for International Cooperation (GIZ)

UNICEF was also supported the development of the Children Department's (DCS) Child Protection Information Management System (CPIMS), which has been plagued by connectivity and roll-out challenges (NCAJ 2019, p. 4, 22).[112] Plan International also supported the Vurugu Mapper[113] to track child abuse in Kilifi county, and International Child Support Africa supported the development of a children's database in Busia county (NCAJ 2019, p. 4). SenJud-ICT noted that in response to the challenges enumerated above, the Judiciary has since proceeded with the development of a "home-grown" software, which further ensures that they have complete control of process and the technology.

Exp-DCS/PACS noted that with respect to Probation (PACS), the lack of training and adequate resources also contributed to the failure of ORMS. On the other hand, the leading reason provided for the success of technology was the training of all its users and their involvement in its implementation. This was reported to be the case for: the Children Department's CPIMS, the Ethics Commission's (EACC) Case Management System, the Judiciary case tracking system, and the Witness Protection's (WPA) intelligence collection devices. Police (NPS) respondents also attributed training of users to the success of its technological initiatives.

Respondents also indicated that technology which was impactful in easing or facilitating work or stakeholder communication also tended to succeed. Examples included the introduction of: (i) online meeting platforms or video conferencing,[114] (ii) internet and official email,[115] and (iii) file or case tracking systems.[116]

Key informants to the present research further revealed that sector-wide challenges persist, which negatively impact on the uptake of technological solutions which would enhance interagency collaboration and coordination. These include: (i) gaps in coordination of ICT policy (ii) resistance from certain criminal justice actors and (iii) structural impediments impacting on the independence of the NCAJ. The section below takes a closer look at these technologies and elaborates on the key impediments to their adoption.

[112] As of 2019, CPIMS had only been rolled out to 20 out of 47 counties in Kenya, and only to DCS offices. While it collates data from several agencies, it can only be used by DCS staff.
[113] See also: https://kw.awcfs.org/article/mobile-application-systems-helps-track-cases-of-child-abuse/ [Accessed 21 July 2022]
[114] NGO / Independent body respondents.
[115] Kenya Prisons Service (KPS), Judiciary and Witness Protection Agency (WPA) respondents.
[116] Ethics and Anti-Corruption Commission (EACC) and Judiciary Respondents.

5.2.3 Agency and Inter-agency Electronic Case or Records Management Systems

An electronic case management system is a software or application created for supporting or managing complex processes that entail both human actions and the automation of case workflows that may have previously been paper-based.[117] These applications also enable storage and access to data, and collaboration by the relevant parties, particularly where they are integrated with the systems of other stakeholders.[118] Integrated (inter-agency) electronic case management systems entail the linking of individual agency systems through API gateway and integrations, to support efficient justice processes and interactions, across the entire justice chain, that is from when a case is initiated at the police station until when it is concluded by the court. In the context on the criminal justice system in Kenya, these processes and interactions are illustrated by ***Diagram 3*** in Chapter One.

The shaded cells in ***Table 22*** below show that across all agencies, the technologies least used by respondents in their functional role were interagency case management systems and online personnel evaluation platforms, which were used "Rarely" (median of 2). This contrasts with private telephone or cell phone, official email, official computer which scored a median of 5, or were reported to be "Always" used. Next were official telephones or cell phones, which are used "between often and always" (4.50). Private computers and agency automated case or records management platforms tended to be used "Sometimes" (3).

Table 22: Medians of Technology most Used by All Respondents

(1=Never, 2=Rarely, 3=Sometimes, 4=Often, 5=Always)

	Official telephone or cell phone	Private telephone or cell phone	Official Email	Official Computer	Private Computer	Agency's automated case or records management platform	Online Inter-agency Case Management Platform	Automated or online personnel evaluation platform
Overall Median	**4.50**	**5.00***	**5.00***	**5.00***	**3.00**	**3.00**	**2.00***	**2.00***

(*= Extreme statistics)

[117] See: https://www.gartner.com/en/information-technology/glossary/case-management-solutions ; https://kissflow.com/workflow/case/case-management-tools/#what [Accessed 22 July 2022]
[118] Supra.

This data is important as it demonstrates that across the board, criminal justice agencies had (prior to the COVID-19 pandemic), not made significant advancements with respect to the adoption of technology used for the coordination of activities related to their functional roles. This is further highlighted by the fact that 84.2% of the respondents believed a case or records management system would enhance the delivery of justice, compared to 3.6% who either did not believe, or know whether it would enhance justice.

The view that automated case or records managements systems enhance the delivery of justice was supported by the external experts. Exp-DCS/PACS noted that an interagency case or records management system would be key to monitoring recidivism by tracking offenders from the moment of first contact with the criminal justice system, as well as track the failures or loopholes in the criminal justice system. The expert noted that this data would in turn inform diversion and rehabilitation programmes, as well as other appropriate interventions.

The shaded row in ***Table 23*** below shows that respondents were also in close agreement that an interagency case management system would have the greatest impact (5 "Major affect") in: (i) enhancing interagency coordination,[119] (ii) enhancing safe custody of records,[120] (iii) hastening justice by reducing bureaucracy,[121] (iv) increasing transparency of criminal justice actors,[122] (v) increasing accountability of criminal justice actors,[123] (vi) saving cost in the delivery of justice,[124] and (vii) reducing gaps and mistakes in the delivery of justice.[125]

Table 23 also indicates that the greatest point of agreement among respondents was that an interagency case management system would enhance "coordination by all criminal justice actors",[126] and therefore, the value of participation. Some of the reasons provided as to why an interagency case management system would ***not*** enhance justice were: (i) there would be lack of cooperation[127] and that (ii) the different mandates of the agencies would be incompatible with the system.[128]

[119] (IQR=5-5)
[120] (IQR=4-5)
[121] (IQR=4-5)
[122] (IQR=4-5)
[123] (IQR=4-5)
[124] (IQR=4-5)
[125] (IQR=4-5)
[126] (IQR=5-5)
[127] National Police Service (NPS) respondent.
[128] Witness Protection Agency (WPA) respondent, (i.e., due to the covert nature of the agency).

Table 23: Medians of "Affect" of Interagency Electronic Case Management System

(1=No affect, 2=Minor affect, 3=Neutral, 4=Moderate affect, 5=Major affect)

		Enhances coordination by all criminal justice actors	Enhances safe custody of records	Hastens justice by reducing bureaucratic process	Increases transparency by criminal justice actors	Enhances accountability by all criminal justice actors	Saves costs in the delivery of justice	Reduces gaps or mistakes in the delivery of justice
"Affect" of ECMS Median		**5.00***	**5.00***	**5.00***	**5.00***	**5.00***	**5.00***	**5.00***
IQR Percentiles	25	5.00*	4.00	4.00	4.00	4.00	4.00	4.00
	50	5.00	5.00	5.00	5.00	5.00	5.00	5.00
	75	5.00*	5.00	5.00	5.00	5.00	5.00	5.00

(*=Extreme statistics)

The PLEAD Baseline Study also identifies lack of cooperation between agencies as an impediment to adopting a sector-wide strategy. Specifically, it points to poor relationships between institutions such as NPS and ODPP as a hindrance in the administration of justice, and as a key factor in delayed trials, resulting in prison overcrowding in some counties (UNODC 2018, pp. 2-3). Exp-DCS/PACS noted that lack of coordination and collaboration rather than resources is the greatest impediment to the adoption of an interagency case or records management system. The expert attributed the reticence among criminal justice agencies to collaborate on mistrust, data privacy concerns and the fear that certain actors may lose relevance and ultimately their jobs with the adoption of this technology. These challenges related to the lack of coordination, and resistance of stakeholders were also well documented in the 2019 JJIMS Needs Assessment Report (NCAJ 2019, p. 20). The report found that while all concerned agencies had some form of paper-based data collections tools relevant to their areas of operation, none of these tools were standardized across the sector to harmonize data collection which was foundational to the success of an integrated child justice case management system (NCAJ 2019, p. 20). The report also found that data sharing protocols were non-existent among the agencies which further complicated the data collection process (NCAJ 2019, p. 20).

SenJud-ICT a Senior ICT officer at the Judiciary, also highlighted the lack of the concerted coordination in the development of a sector wide ICT and case management strategy at the NCAJ. The officer added that this has meant that the individual agencies have adopted a silo

approach to case management, without consideration of the needs of other agencies they may be required to interface with. This problem was also apparent in Brazil's approach to the digitalization of its justice sector, due to the fragmented ICT initiatives by individual courts (Rosa *et al.* 2013, p. 244). This was later resolved by the development of a national strategy in 2014 to equip all courts and implement an information management system that unifies the entire justice system (Rosa *et al.* 2013, p. 244). This process was overseen by a Steering Committee made up of Federal government and civil society representatives (Rosa *et al.* 2013, p. 244). Rwanda also benefitted immensely from adopting a coordinated approach in the implementation of an Integrated Electronic Case Management System (IECMS) through the leadership of the Ministry of Justice and the Justice, Reconciliation Law and Order Sector [JRLOS][129] (Watson *et al.* 2017, pp. 1-2; Watson and Matevosyan 2021, p. 2). Watson *et al.* write that:

> *"The level of coordination needed to roll out an interagency information system is highly sophisticated. In Rwanda, this was made possible through the combination of a highly centralized government and a predefined Sector Wide Approach. ... This puts the government in the driver's seat, versus individual donor projects with limited capacity for collective strategy and planning."* (Watson *et al.* 2017, pp. 6-7)

SenJud-ICT emphasized that in Kenya, the NCAJ should take leadership in presenting a justice sector ICT master-plan to ensure cohesion, and harmonious integration of the systems. This view was supported Exp-NGO/JUD/NCAJ who noted that post-COVID-19, there had been challenges in the integration of the ODPP case management system with the Judiciary case management system due to the incompatibility of the systems.

As mentioned in the earlier analysis in section 5.1, NPS, ODPP and the Judiciary, as well as the core court functions and processes are at the center of the administration of justice. It was further established that any attempt to fully adopt cross-cutting technology such as an interagency case management system would require the co-operation and leadership of these institutions. This means if these institutions are resistant to change, or by other means incapacitated, achievement of this goal is unlikely to succeed. In this regard, the adoption of interagency case management systems would need to be built around court operations, or the

[129] JRLOS much like the NCAJ in Kenya, was for the purposes of the Rwandan IECMS project, a convening and coordinating body that established a forum for interagency communication, resource pooling and leadership. It had a Steering Committee with representatives from stakeholder agencies and at technical team responsible for driving the project on behalf of the beneficiary institutions.

core functions of the court which are the processes agencies collaborate most on. SenJud-ICT [redacted] noted that the failure of previous attempts to implement a case management system at the Judiciary was the consequence of a disconnect between those initiatives from the core court functions, and its key users i.e., judges and the registrars.

SenJud-ICT added that a further impediment was that each solution such as video conferencing, case management and payroll, were looked at and implemented in isolation. The expert explained that the latest (2014) attempt to implement an integrated court management system, addressed these gaps by: (i) ensuring that a judge led the process, (ii) considering all related facets of court administration and, (iii) requiring that technicians developing the system had a sound understanding of court processes by immersing themselves in these processes for a minimum period of two (2) weeks. The expert further noted that to ensure enhanced efficiencies, all judiciary departments and court users were also engaged and provided their input to the Judiciary's ICT policy and Master Plan, in essence allowing for a "participatory approach" in the process. SenJud-ICT however noted that the process did not involve widespread external consultation largely because the NCAJ was at the time, not sufficiently resourced or empowered to facilitate the process as an independent oversight and co-ordination body.

Table 24 below shows that pre-COVID-19, the Children's Department (DCS) used its own automated case or records management system, the Child Protection Information Management System (CPIMS), the most (4 "Often). Exp-DCS/PACS however noted that this system has significant shortcomings as it is not incorporated into all children's institutions, (e.g., rehabilitation schools), which results in: gaps in the monitoring of recidivism, gaps in tracking juveniles through the criminal justice system and ultimately ineffective interventions and programmes to support children in conflict with the law. The JJIMS Needs Assessment Report found that CPIMS unlike its predecessors was developed at a time when it could leverage on the internet and server technology (NCAJ 2019, p. 4). However, these very factors became a major challenge for it due to the lack of adequate space to administer the server, unaffordable licensing requirements and unstable connectivity (NCAJ 2019, pp. 4, 22).

Pre-COVID-19, NGOs / Independent bodies, the Ethics Commission (EACC), Judiciary, the Police (NPS) and Witness Protection (WPA) reported they tend to use automated case or records management systems "Sometimes" (3). The Prosecution (ODPP) had the lowest median rating for the use of this technology (1 "Never").[130] Other institutions with low medians

[130] Note that the ODPP's use of ECMS changed after the COVID-19 pandemic, as it launched the *Uadilifu* Case Management System (Discussed later in the chapter).

for the use of automated case or records management systems were NCAJ Secretariat, the Prisons Service (KPS) and Probation (PACS).

Table 24: Medians of Use of Agency Case or Records Management Platform

(1=Never, 2=Rarely, 3=Sometimes, 4=Often, 5=Always)

Agency	Agency's automated case or records management platform
DCS / Children's Department	4.00*
NGOs / Independent bodies	3.00
EACC / Ethics Commission	3.00
Judiciary	3.00
KPS / Prisons Service	2.00
NCAJ Secretariat	1.50
NPS / Police	3.00
ODPP / Prosecution	1.00*
PACS / Probation	2.50
WPA / Witness Protection	3.00
Total	**3.00**

(*=Extreme statistics)

The PLEAD Baseline Study provides some insight into these findings with respect to ODPP's low ratings for the use of agency case or records management system prior to the COVID-19 pandemic. It found that in November 2014, ODPP engaged a consultant to review its business processes, which resulted in a recommendation that the agency implements an automated case management system (UNODC 2018, p. 30). The project however stalled due to the high cost of implementing the system, i.e., Kshs. 200 million or approximately USD 2 Million (UNODC 2018, p. 30). This situation only changed after the COVID-19 pandemic which forced criminal justice agencies to accelerate their technological uptake and adapt their structures to the new realities created by the pandemic.

The PLEAD Study also linked ODPP's lack of an automated case management system to inefficiencies in a separate but related issue – personnel evaluation. The shaded rows in ***Table 25*** below also show that pre-COVID-19, ODPP (along with KPS and NCAJ) also had the lowest median for the use of "automated or online personnel evaluation platforms" (1 "Never"). The consistently low ratings of KPS in relation to technological uptake, including in personnel evaluation, confirms the earlier findings that the agency is poorly "facilitated".

Table 25: Medians of Use of Automated or Online Personnel Evaluation Form

(1=Never, 2=Rarely, 3=Sometimes, 4=Often, 5=Always)

Agency	Automated or online personnel evaluation platform
DCS / Children's Department	3.00
NGOs / Independent bodies	3.00
EACC / Ethics Commission	2.00
Judiciary	3.00
KPS / Prisons Service	1.00*
NCAJ Secretariat	1.00*
NPS / Police	3.00
ODPP / Prosecution	1.00*
PACS / Probation	2.50
WPA / Witness Protection	2.50
Total	**2.00**

(*=Extreme statistics)

The PLEAD study noted that an automated case management system would serve the dual purpose of monitoring the outputs of prosecutors (UNODC 2018, p. 30).

Prosecutors interviewed for the PLEAD study stated that due to this failure, it was difficult *"to objectively measure the performance of a prosecutor"* (UNODC 2018, p. 30). The report concluded that the automated case management system would not only positively impact on the efficiency of the institutions, but would also enhance transparency and public trust in the institution (UNODC 2018, p. 30). The 2016 Criminal Justice System Audit (report), also recommended that along with the implementation of case management systems in various court stations:

> *"...the procurement of the complementary Integrated Performance Management and Accountability System (IPMAS) ...be fast-tracked"* (NCAJ 2016, p. 69).

This research goes to show that the issues of case management and performance management are inextricably linked, and that the failure of institutions to successfully deploy these systems creates opacities that impact not only on the assessment of the efficiency of the institutions, but also on human resource accountability.

In the 2018/19 SOJAR report, [131] the Judiciary also makes a direct link between the digitalization of court processes and enhanced performance measurement to improved access to justice (Judiciary of Kenya 2020(a), p. 23). In essence, the Judiciary acknowledges that, beyond streamlining processes and measuring performance, both these strategies, among others listed would ultimately contribute to the overall accessibility and experience of the justice system by the court users.

Finally, it also emerged during the key informant interviews that a key challenge to the implementation of automated case management systems, and in particular interagency or interoperable systems which allow for enhanced transparency, accountability and coordination is cyber security. In this regard, SenJud-ICT noted that a major consideration for the implementation of integrated digital systems in the justice sector is security. He noted that digital systems necessarily require an expansive ICT security infrastructure or architecture, including for securing the infrastructure itself, securing the data and responding to or mitigating security breaches. The expert noted that the development of this security architecture is currently the largest project and preoccupation of the Judiciary.

5.2.4 The Catalyzing Impact of the COVID-19 Pandemic

The COVID-19 pandemic, and the national measures adopted to *"flatten the curve",* provided an unexpected momentum for the adoption of technology by Kenya's justice sector as a whole. [132] An analysis of the mechanisms used in facilitating democratic or participatory decision-making prior to the COVID-19 pandemic, overwhelmingly demonstrated that in-person meetings were the most widely used methods for obtaining participation from staff, criminal justice and public stakeholders.[133] These in-person engagements included: (i) staff meetings, (ii) meetings with supervisors, (iii) stakeholder Taskforce or committee meetings and (iv) public *fora* or meetings. The data also revealed that pre-COVID-19, technology had almost no role in facilitating stakeholder participation in policy-making and implementation. In-person meetings are however resource straining, due to the financial resources and time required to organize and coordinate travel among other logistics. These methods are also vulnerable to *quorum* failures.

[131] State of the Judiciary and Administration of Justice Report (SOJAR).
[132] See media release here: https://www facebook.com/StateHouseKenya/posts/presidential-address-on-the-state-interventions-to-cushion-kenyans-against-econo/3389934827688684/ [Accessed 23 November 2020]
[133] See Tables 23-26 in Annex VII.

The NCAJ Strategic Plan (2021-2026) notes that during the pandemic, the justice sector experienced an acceleration in the use of technology that has never been seen in the life of the NCAJ (NCAJ 2021, pp. 2, 13). The pandemic also highlighted the importance NCAJ, which was pivotal in coordinating the justice sector response to the pandemic. The draft Plan goes on to recommend the development of:

> *"…NCAJ policy and protocols on the use of technology in service delivery in the justice sector…"* as well as the implementation of an *"….integrated case management system by justice sector agencies"* (NCAJ 2021, pp. 23, 41).

The widespread adoption of virtual meeting platforms such as Zoom and Microsoft Teams enhanced communication and coordination within the sector. Exp-NGO/JUD/NCAJ noted that the Judiciary was in 2020 able to benefit from a year's free subscription to the Microsoft Teams virtual meeting platform courtesy of the Ministry of ICT.

The expert also noted that these tools were particularly useful for NCAJ, as its role in coordinating the justice sector response to the COVID-19 situation was highlighted on the national stage.[134] NCAJ adopted virtual meeting platforms to coordinate action of its individual members, both at a policy and technical level, in ensuring that disruption of interagency linkages were mitigated or all together avoided. This was confirmed by Sen[redacted] NCAJ, [redacted] who specifically credited the adoption of virtual meeting platforms such as Zoom and Teams, for enhancing interagency collaboration during the COVID-19 pandemic. Other mechanisms widely adopted after the COVID-19 pandemic for stakeholder coordination identified by the experts were the *Whatsapp* application for instant messaging, the *Gotomeetings* platform for online trainings as well as the *googlemeet*s platform, and *google calendar* for notification of court dates.

Exp-ODPP/NPS/WPA and Exp-DCS/PACS however identified some challenges to the adoption of meeting platforms. Exp-DCS/PACS noted that the systems were susceptible to abuse as uncommitted participants would log-in but not actually participate in the meetings. The expert noted that ground rules and protocols such as rules on the use of cameras are necessary to ensure that such abuses are prevented. Exp-NGO/JUD/NCAJ also noted a similar experience with respect to online trainings, however in this latter case the lack of sufficient internet connectivity or "bundles" was found to exacerbate the issue.

[134]See NCAJ website here: https://ncaj.go ke/continuing-review-of-justice-sector-operations-in-the-wake-of-the-covid-19-pandemic/ [Accessed 23 November 2020]

Exp-ODPP/NPS/WPA stated that though these platforms were cost effective, senior decision / policy makers were not incentivized to participate and often delegated participation to junior staff members which further delayed decision-making. These examples go to show that while the use of virtual meeting platforms is still in its infancy, there is an emerging necessity to create structures and protocols around these platforms to ensure that they are not abused or work against the objectives they seek to achieve. Exp-NGO/JUD/NCAJ noted that with respect to the NCAJ, these emerging challenges have been escalated to the Council for policy direction.

The Judiciary was also able to upscale its services using ICT tools such as video conferencing for virtual hearings, e-filing and emails to deliver urgent judgements.[135] On 1 July 2020 the Judiciary launched e-filing in Nairobi courts.[136] E-payment (for court filings etc.) was also introduced during this period, however Exp-NGO/JUD/NCAJ noted that due to system lags and lack of sufficient training of the users, the use of these facilities declined and users reverted to previous corruption prone cash-based systems.

On 28 of July 2020, the Prosecution (ODPP) launched its automated case management system.[137] This system was named *"Uadilifu"* in Kiswahili, which translates to "integrity", thus denoting its role of facilitating this value in the administration of justice. Exp-NGO/JUD/NCAJ noted that post-COVID-19, the NCAJ's Special Taskforce on Children Matters also launched a Juvenile Justice Integrated Management System (JJIMS) at the Makadara law courts (Nairobi).[138] This system which was launched on 29th June 2020 is designed to track children in conflict with the law as they move through the criminal justice system. The system is expected to collate data on children in the justice system from the Children's Department, Probation, Prisons, Police, Judiciary and the Prosecution (NCAJ 2019, p. 7). Finally, on 3rd August 2020, the National Police Service (NPS) launched a Digital Occurrence Book (OB).[139]

During the pandemic, agencies also took steps towards moving their training programmes to e-learning platforms. NPS were the first to take this step on 29 July 2020 when they launched their online training program, with the support of the United Nations Office on Drugs and

[135]See the NCAJ website here: https://ncaj.go.ke/judiciary-to-upscale-justice-delivery-through-increased-use-of-technology-to-delay-resumption-of-open-court-activities/ [Accessed 23 November 2020]
[136]See report on launch here: https://www.judiciary.go ke/judiciary-e-filing-system-launched-for-nairobi-courts/ [Accessed 23 November 2020]
[137]See video of launch here: https://www.youtube.com/watch?v=yWTWGcIT018 [Accessed 23 November 2020]
[138] See report on launch here: Launch of JJIMS in Makadara Law Courts 29 June 2020 [Accessed 13 May 2022]
[139] See report on launch here: https://www.ipoa.go.ke/ipoa-lauds-efforts-to-modernise-the-national-police-service/ ; https://www.unodc.org/unodc/frontpage/2020/August/COVID-19 -launch-of-first-ever-online-training-for-kenyas-national-police-service html. [Accessed 13 May 2022; 3 August 2022]

Crime (UNODC), and the European Union funded PLEAD Programme.[140] The Kenya Judiciary Academy also launched their e-learning platform on 18 October 2021[141], while the Probation and Aftercare Service (PACS) launched theirs on 28 April 2022.[142]

These developments go to show the impact of catalyzing events, such as the COVID-19 pandemic in providing the goodwill, impetus, commitment, and conscientiousness required in dramatically progressing long running technological goals. The pandemic created unique challenges that presented circumstances similar to seminal "constitutional moments", that helped propel the entire sector forwards in this regard.

5.2.5 Coordination Role of the National Council on the Administration of Justice

According to Watson and Matevosyan (2021), the successful implementation of integrated electronic case management systems depends on among other factors, the identification of a convening body with the *"authority, funding and motivation to drive innovation and bring all stakeholders to the table"* (Watson and Matevosyan 2021, p. 4). They emphasize that this body should have the political clout and flexibility to make authoritative decisions that move the project forward (Watson and Matevosyan 2021, p. 4).

The previous discussion highlighted the role of the National Council on the Administration of Justice (NCAJ) in coordinating the justice sector response to the COVID-19 pandemic. The interviews also revealed that for the reasons provided by Watson and Matevosyan above, the NCAJ would also be key to a sector-wide approach to the adoption of technology, and in particular inter-agency case management systems.

SenJud-ICT noted that the main challenge in this regard has been that the justice sector is not integrated in terms of project coordination and funding. This means that different agencies have been moving at a different pace and without consideration of the technical requirements of the other agencies, for purposes of interfacing with their systems. He recommended that the NCAJ should take a lead in coordinating the process, beginning with coordinating the development of a ICT master-plan for the entire sector. The membership of the NCAJ would therefore use this master-plan as a template in developing their individual agency ICT masterplans.

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[140]See report on launch here: https://www.unodc.org/unodc/frontpage/2020/August/COVID-19_-launch-of-first-ever-online-training-for-kenyas-national-police-service html [Accessed 23 November 2020]

[141] See speech during launch here: https://www.judiciary.go.ke/download/%e2%80%8e-speech-by-justice-martha-koome-during-launch-of-the-%e2%80%8ekenya-judiciary-academy-campus-installation-of-justice-%e2%80%8edr-smokin-wanjala-as-incoming-director-of-the-jti-and/ [Accessed 4 August 2022]

[142] See report here: Elearning innovation to boost probation in Kenya (unodc.org) [Accessed 4 August 2022]

In this regard, Exp-NGO/JUD/NCAJ noted that in 2018 the NCAJ had commenced informal discussions on the integration of case management systems. On 22 July 2022 the NCAJ Working Committee on ICT was established under the leadership of the Judiciary,[143] to ensure a coordinated approach to the adoption of technology including the integration of systems in the justice sector, and, of the enabling ICT legal and regulatory frameworks (NCAJ 2022, pp. 14, 126-127).

Both Exp-NGO/JUD/NCAJ and SenJud-ICT noted that while the Judiciary is leading the ICT revolution in the sector in terms of case management, and is the agency to which all others would be seeking to integrate with, it cannot be seen to take sole leadership on the issue of integration as this would likely result in resistance from the other agencies. With respect to Kenya this delicate balance was managed by housing the sector's ICT Committee at the NCAJ with all institutions represented, while allowing the Judiciary through the Chairmanship of a superior court judge,[144] to steer the process as the natural leader in the space, both in terms of technology and convening power when it came to the work of the Committee.

This view is supported by international practice in the deployment of e-justice systems, such as those with an interoperability component e.g., inter-agency case management systems (Cordella and Cortini 2020, p. 14). In this regard, the Judiciary has been found to be among the institutions concerned and not the institution in control of the development process (Cordella and Cortini 2020, p. 14). The same discussions were held around the custodianship of the inter-agency Juvenile Justice Information Management System [JJIMS] (NCAJ 2019, p. 22). While some argued that the Children's Department had the largest stake when it came to children matters and should therefore take custody, and others felt that the Judiciary should take custody as it is central to the justice system, the NCAJ eventually took the lead as it brought the widest spectrum of stakeholders together (NCAJ 2019, pp. 5, 6, 22). The JJIMS Needs Assessment Report found that as the custodian or convening institution, the NCAJ could play a crucial role in overcoming what has been a major challenge to successful inter-agency case management in Kenya – the harmonization of data capture on children in contact with the law, by the relevant agencies (NCAJ 2019, p. 24; Watson and Matevosyan 2021, p. 4).

SenJud-ICT therefore emphasized the importance of the independence of NCAJ for the integration project to succeed, noting that the existing perception of lack of autonomy due to the dominance of the Judiciary in key NCAJ positions. Sen[redacted] NCAJ [redacted]

[143] Gazette Notice 141 of 22 July 2022.
[144] The first and current Chair of the Committee is, Hon. Justice Isaac Lenaola, Judge of the Supreme Court of Kenya, and Chair of the Integrated Court Management System (ICMS) Committee of the Judiciary.

[redacted] agreed that this perception is well grounded given the fact that the positions of Chairperson of the Council of the NCAJ, Secretary of the NCAJ, and CEO of the NCAJ were all filled by senior Judiciary office holders. [redacted] further noted that funding also comes from the Judicial Service Commission.

Sen[redacted] NCAJ stated that at the NCAJ deliberations, during the early stages of the COVID-19 pandemic, resistance to the use of e-filing among other technology only came from the Law Society of Kenya (LSK). Cordello and Contini acknowledge that the deployment of solutions such as e-filing, e-payments and e-summons is challenging because of the organisational and procedural compliance required of other actors or court users such as lawyers (Cordella and Cortini 2020, p. 13).

Sen[redacted] NCAJ also clarified that the role of the NCAJ should not be to host the servers that would facilitate the integrated electronic case management system. Rather it should be to coordinate discussions between technical officers in the different agencies on the development of the system. He agreed with SenJud-ICT's view that the NCAJ should be the forum in which policy and regulatory discussions occur on the integration of systems. According to him, implementation of the system should occur at the individual institutions.

This discussion demonstrates the balancing act and careful assessment required in coordinating technological uptake within the sector where the individual actors are at different stages in their own technological development. It is clear that in the justice sector, the Judiciary is further along in automating its systems. It is also clear from the foregoing analysis that the core court functions and processes are at the center of the administration of justice within the formal justice system. These factors, coupled with the fact the Judiciary once again dominates the NCAJ structure, create a major challenge for the integration of case and other records management systems while respecting the perception of NCAJ independence, and therefore avoiding institutional resistance. The first step towards mitigating this challenge would be restructuring the NCAJ to ensure more equitable representation in the structures of leadership. This would allow for robust and inclusive discussions on the intended goals of the system in the administration of justice. It would also entail ensuring legal and policy backing for technological adoption that would provide the framework for such adoption taking into account pre-existing legal and constitutional provisions on issues such as due process and the protection of vulnerable groups.

5.3 Conclusion

Barendrecht notes that one of the ways in which governments provide public goods is through the formulation of "justice policies" (Barendrecht 2009, p. 4). Chapter Two framed this discussion by providing an indication of the internal and external transaction costs that impact the policy-making and implementation processes, and ultimately on the delivery of justice. In this regard, Barendrecht states that:

> *"One of the classical responsibilities of states towards their citizens is to establish the rule of law and to ensure access to justice."* (*Barendrecht* 2009, p. 4)

The discussion in this chapter demonstrates that these policy-making and implementation processes are not only a mitigating response to high transaction costs within the justice sector, but are themselves also subject to high transaction costs resulting from inadequate assimilation of values, inadequate facilitation, inadequate operational mechanisms and ineffective interagency coordination.

In identifying and examining the role and impact of these transactions costs in the formulation and implementation of justice policies in Kenya, this discussion presents the factors that would contribute to the transformation of Kenya's justice sector agencies from LAO institutions to OAO institutions, as described in Chapters Two and Three. This conclusion reflects on the implications of NIE in the transformation or reform of Kenya's justice sector, into the Open Access Order ideals explored in foregoing chapters. The analysis finds that this transformation can be achieved in two key ways: first through greater assimilation of constitutional values, and second, through adequate facilitation or the provision of operational and coordination factors. It is at the intersection of both these considerations, that is, values and facilitation, that the role of technology in facilitating institutional transformation is explored in this thesis.

It emerged in the present discussion that while Kenya's justice sector has come a long way in institutional reform since the promulgation of the 2010 Constitution, much still needs to be done in actualizing the values and principles of governance articulated in Articles 10 and 232 of the Constitution, and in particular the values of transparency and accountability. The goal remains to embed these values into the institutional fabric and culture of justice sector agencies across the board. It is also evident that there is need for greater focus on certain agencies such as the Children's Department (DCS), Police (NPS), Prosecution (ODPP), Probation (PAC) and the Judiciary which are lagging on the values and/or the threats to integrity.

With respect to the value of accountability, it emerged that accountability of superiors was the greater threat to the integrity of institutions. It is therefore crucial the measures adopted, including the incorporation of technology, target this gap in accountability, and particularly that of superiors. In addition to this, the research also demonstrated the need for enhanced oversight over "oversight bodies" such as NGOs / Independent bodies and the Ethics Commission (EACC). These institutions should also be seen as vulnerable to lapses in integrity and should therefore be subjected to systematic internal and external oversight.

The value of democracy or "participation of the people" (that is, of all stakeholders), also emerged as a key theme in the discussion. The data shows that while the value of democracy is comparatively well assimilated in the justice sector considered as a whole, one area emerged as needing additional focus – staff participation in decision-making impacting on the organisation as a whole. In this regard, the discussion found that participation entails not only the breadth of participation, that is, that of all stakeholders (staff, criminal justice bodies and the public), but also the depth and quality of participation. It emerged that staff participation in decision-making should cover the scope of matters encompassing their individual departments and their organisation as a whole. It further emerged that criminal stakeholder participation – particularly that of agencies at the center of court processes is critical to the eventual success of justice policies. Nevertheless, it was noted that even within the court process, interventions should remain centered on, and responsive to the court users, and in particular justice seekers and communities at the center of the justice process. Public participation was also seen to be important, particularly in the assessment of how implemented policies are working.

It was further revealed that the "analog" methods adopted to facilitate stakeholder participation, such as in-person meetings, were found to be not only wasteful but also inefficient, particularly in light of the developments brought about by the COVID-19 pandemic. The discussion in this chapter further illustrated that agency and interagency case and records management systems are critical in coordinating interagency action, and for monitoring the efficiency of the sector, as are automated performance management systems. The impact of online communication platforms such as Zoom and Microsoft Teams was also seen to be critical in coordinating the justice sector's response to the pandemic, as well as enhancing transparency and accountability within the sector. The discussion on technological adoption however brought up various important considerations and assumptions for the successful deployment of technology towards the stated transformational goals. The first would be timing. The research revealed the seminal events of the COVID-19 were an unprecedented accelerant to the progression and / or implementation of long stalled, or previously unconsidered technological projects. During this

period alone, multiple justice sector agencies adopted agency case management systems, online training platforms and communication platforms in their day to day activities, as well as in the coordination of the sector. The lesson here is that implementers would need to be strategic in making the most of the momentum created by this crisis, or other facilitating "constitutional moments".

Secondly, it also emerged that the national coordinating body, the National Council on the Administration of Justice (NCAJ) would be a key player in coordinating the seamless adoption of technology in the sector, such as integrated case management systems. Apart from the NCAJ, it also emerged that certain agencies are key to the administration of justice, and would therefore be essential to the successful adoption of interagency case and records management systems. These agencies are the Judiciary, Prosecution (ODPP) and Police (NPS). Without the cooperation and close collaboration of these agencies, the digitalization project – particularly where it pertains to interagency case management, would collapse. This should however be balanced with providing greater visibility and relevance to underappreciated agencies such as Probation (PACS), the Witness Protection Agency (WPA) and Children's Department (DCS).

The analysis also revealed other basic assumptions underpinning the successful adoption of interagency technology, that is: stable internet connectivity, technical capacity or adequate training on the use and implementation of the technology, adequate funding, legislative and regulatory backing as well as responsiveness to emerging to challenges such as online security and competing or conflicting mandates. In essence, the discussion in this chapter indicates that technology may have a pivotal role to play in enhancing the delivery of justice in Kenya, as well as in addressing the underlying value-centered shortcomings, therefore enabling institutional reform.

6.0 THE ROLE OF BLOCKCHAIN IN JUSTICE SECTOR TRANSFORMATION

Chapters Two and Three argued that the transition from a LAO to an OAO justice sector and society can be expedited by an open government model of governance aided by technology, and founded on the constitutional values of democracy, transparency, accountability, and social justice. This application chapter explores how the Kenyan justice system can leverage blockchain technology, in electronic case management to mitigate, if not eliminate some of the negative outcomes observed in Chapters One and Five. [145]

Technology, and in particular blockchain technology, is therefore explored in this chapter as a means towards this end – an alternative path towards integrating these values to enhance the administration of justice, and access to justice for court users. The proposed adoption of blockchain is nevertheless premised on the assumption that the implementing nation has at a minimum attained the status of a mature LAO, as well as the "door-step conditions" necessary for the OAO transition as discussed in Chapter Two. The goal of this chapter therefore, is to examine how blockchain technology intersects with Kenya's constitutional values, to potentially facilitate an accelerated path towards an open access justice sector which is a core feature of the OAO, as described in Chapters Two and Three.

Due to the nascent and emerging nature of this technology, the discussion to follow is largely exploratory and limited to the current developments, applications and proposed applications of blockchain in justice sector electronic or automated case / records management. Much of the existing literature that informs this chapter is therefore also exploratory, and anticipates the potential and future capabilities of the technology in this limited respect. This discussion therefore gives some latitude to the relative immaturity of the technology, and recognizes that many of the teething problems experienced by the technology will eventually, or are currently being resolved for it to work as intended. These limited applications or proposed applications of blockchain in electronic case management are nevertheless critically engaged with, to reimagine how the technology could currently, or with future iterations be deployed to mitigate some of the high transaction costs in Kenya's "limited access" justice sector.

In essence, this chapter interrogates the claim that blockchain is a new institutional technology of governance that can disrupt traditional institutions of capitalism such as, firms, markets, networks and even government (Davidson *et al.* 2016, p. 3; Lluis de la Rosa *et al.* 2017*,* p.18). Blockchain is therefore seen to be an important mechanism for not just reducing the costs of

[145] Justification of the Thesis and the Research Analysis respectively.

production e.g., such as those that go to intermediaries, but more importantly, like the firm or markets, as a mechanism for economizing on transaction costs which impact on the efficiency of organisations (Davidson *et al.* 2016, p. 13-15). If as Oliver Williamson posits,[146] hierarchies exist to *"control opportunism in the presence of bounded rationality and asset specificity",* blockchain smart contracts and Decentralized Autonomous Organisations (DAOs) may be seen as measures for eliminating such opportunism (Davidson *et al.* 2016, p. 16).

The chapter also considers the views of Atzori and others who challenge the extreme views held by techno-libertarians and crypto-anarchists, that the State is an illegitimate, unnecessary and obsolete concept, which ought to be replaced by blockchain and similar technologies (Atzori 2015, pp. 4-5). This thesis therefore advocates for the adoption of a constitutionalist approach to the implementation of blockchain and other emerging technologies. This entails maintaining the State's constitutional role as the ultimate arbiter of conflict and governing authority, while both complementing and ensuring checks and balances to the exercise of this governance role through, among other means, the adoption of blockchain technology.[147]

In taking this analytical approach, the chapter incorporates two interviews focusing on the attributes and implementation of blockchain technology. The first expert is involved in the design and implementation of the technology in social enterprise projects (hereafter referred to as "Exp-Blockchain"). This expert provides an overview of the attributes and limitations of the technology. The other expert (hereafter referred to as "Exp-Egov/Estonia"), is an e-governance expert currently involved in the implementation of blockchain in Estonia's public and criminal justice sector.

The chapter therefore begins in section 6.1, by providing a background and overview to the origins and mechanics of blockchain technology. Section 6.2 outlines some of the potential benefits, use-cases and limitations of the technology in electronic case or records management. Section 6.3 examines the risks and challenges of such implementation, and section 6.4 concludes the chapter.

6.1 Overview and Origins of Blockchain Technology

Blockchain is defined in Chapter One as a cryptographically secured ledger that is maintained by a peer-to-peer (P2P) network (Davidson et al. 2016, pp. 4, 6). The technology was first

[146] See discussion in Chapter Two.
[147] See an explanation of "constitutionalism" here: https://plato.stanford.edu/entries/constitutionalism/ [Accessed 14 December 2022]

associated with Bitcoin which is today accepted as a store of value or "cryptocurrency" (Martinovic *et al.* 2017, p. 2). In this respect, blockchain's novelty or innovative edge was to enable P2P payment transactions between parties without the need for intermediation e.g. by banks or other money exchange authority (Nakamoto 2008, p.1; Martinovic *et al.* 2017, p. 2). It did this mainly by presenting a notably enhanced security value proposition, based on its radical authentication and immutability features (Martinovic *et al*. 2017, p. 4). With this technology a person holding the cryptocurrency in an e-wallet with the requisite public and private keys (further discussed below), can directly send the cryptocurrency to another with a corresponding e-wallet. This transaction is disintermediated because it is *authenticated* not by a bank or other centralized authority, but by a network of computers working towards this goal through a *"consensus mechanism"* described in greater detail below (Martinovic *et al.* 2017, p. 6). This P2P form of transacting created by Satoshi Nakomoto[148] potentially presented a ground-breaking shift in the orientation of the world order.[149] ***Diagram 26*** below illustrates the processing and storage of p2p transactions on a blockchain in six simplified steps.

Illustration 26: Processing and Storage of a Transaction on the Blockchain

Source: (Ghiro et al. 2021, p. 2)

[148] Pseudonym (The Bitcoin inventor's identity has to date not been established with certainty).

[149] *Martinovic et al.* (2017) however note that the technology behind blockchain, specifically its underlying cryptographic constructs have existed long before the emergence of Bitcoin. Satoshi's innovation leveraged on existing P2P network systems, over 20 years of research in cryptographic currency and over 40 years research in cryptography (See Karanja 2018 p. 7; Swan 2015, p.2). See also; Tapscott, D. and Tapscott, A., 2016. Blockchain Revolution: How the Technology Behind Bitcoin is Changing Money, Business, and the World. New York. Penguin Random House LLC. pp. 108-109.

In the first step, once the transaction is submitted on the network, it is broadcasted to the network of nodes that run the consensus protocol to validate the transaction *(Ghiro et al. 2021, p. 2).* Once validated the transaction is grouped with other valid transaction to form a new block which is then added to the blockchain, thus elongating the "chain" *(Ghiro et al. 2021, p. 2)*.

6.1.1 Blockchain and the Decentralization of Trust

Principally, Bitcoin's underlying technology – *blockchain* – threatens to disrupt the central banks, as the key intermediaries in market economies and their influence over monetary policy (De Filippi and Wright 2018, p. 70). With the advent of this technology and its digital currencies, central banks would, potentially, no longer be necessary to regulate money supply as the issuance of new supply would be purely determined by code and cryptography (De Filippi and Wright 2018, p. 70). This development was welcomed by many particularly after the 2007-8 global financial crisis caused by financial and banking malpractices (Jalakas 2018, p. 16; Karanja 2018, p. 6). After this crisis, no longer did it seem safe or expedient to place trust solely in potentially corrupt or incompetent centralized financial institutions.

Rather, it appeared preferable to transfer this role to technology that offered a tamper-resistant way to validate or verify the authenticity of transactions, while resolving the double-spend problem,[150] without the need for a "trusted" third party (Swan 2015, p. 2). Under this new paradigm *"trust"* is disintermediated to computers hosting nodes[151] (or *miners*), which verify the transactions and each maintain a public ledger of the transactions through a *consensus mechanism* based on cryptography (Nakamoto 2008, p.1; Atzori 2015, p.2;). This has come to be known as "*trust-by-computation,* or the *decentralization* or *democratization of trust"* (Atzori 2015, p.2). Therefore, while in a centralized network, a single decision making entity or node owns the application that provisions and maintains the source code deployed on the network, in a decentralized network the code runs on a peer-to-peer network of nodes, and none of them instructs the other nodes on what to do, as each can independently make decisions.[152] With the decentralized network, if one node is targeted and eliminated by an outside threat, or

[150] Where the same money or value is spent twice, or on more than one transaction.
[151] Nodes in the context of blockchain are computers within a larger network of computers, that run blockchain's consensus protocol or software to validate transactions and keep a complete historical record of all the transactions on the network. See more on nodes here: https://www.coindesk.com/learn/what-is-a-node/ [Accessed 15 August 2022]
[152] See more on centralized, decentralized and distributed networks here: https://blockchainengineer.com/centralized-vs-decentralized-vs-distributed-network/ [Accessed 13 August 2022]

shuts down its operations, the integrity of the network and its record of transactions is preserved. Conversely, a single node cannot unilaterally shut down the operations of another node, or alter the recorded history of transactions authenticated by the network, as each node is independent and keeps a complete record of the transactions.

The other iteration illustrated in ***Illustration 27*** below is the distributed network, which is often confused with the decentralized network. With this system, processing may be spread across several nodes in different locations, which all communicate with each other, however decision making can either be centralized or decentralized.[153] The best examples of the a distributed network managed by centralized entities are those that entail cloud computing such as; the internet (Google), Facebook, Amazon or Netflix.[154] On the other hand the *public* bitcoin blockchain is both decentralized and distributed.

Illustration 27: Illustration of Centralized vs. Decentralized vs. Distributed Networks

Source: Blockchain Engineer, Julio Marín [155]

[153] Supra; See more on distributed networks here; https://zipmex.com/learn/distributed-vs-decentralized/ [Accessed 13 August 2022]
[154] See here: https://berty.tech/blog/decentralized-distributed-centralized/; https://blockchainengineer.com/centralized-vs-decentralized-vs-distributed-network/#:~:text=Distributed%20means%20computation%20is%20spread,has%20control%20over%20the%20dApp. [Accessed 14 August 2022]
[155] Supra. See also: https://medium.com/@juliomacr/centralized-vs-decentralized-vs-distributed-a-quick-overview-1f3bd17b8468 ; https://berty.tech/blog/decentralized-distributed-centralized [Accessed 20 August 2022

Importantly for this thesis therefore, the public blockchain becomes a new mechanism for establishing trust through its core features that facilitate unparalleled "transparency", "accountability" and "participation" in the authentication of transactions. The public blockchain is more *transparent* than traditional ledgers or records management platforms as it accessible to anyone on the blockchain. It also allows for greater *accountability* due to its tamper resistance or immutability. Finally the public blockchain allows for greater *participation* as anyone could hypothetically anonymously contribute towards the authentication of transactions, contribute to the improvement of the bitcoin protocol (without fundamentally changing its core features), or access the ledger to verify the authenticity of a transaction.[156] Therefore, according to Ghiro *et al*., the core features that set the (public) blockchain apart from other DLTs are, *immutability, transparency* and *anonymity* (Ghiro *et al.* 2021, p. 1).

This thesis seeks to examine how one could leverage on among these, other attributes or values of the blockchain in the administration of justice through its integration with case or records management systems. The goal would be to overcome some of the challenges in the administration of justice discussed here including, the loss or tampering of records through inefficiency and corruption. It shall be seen in discussions to follow that jurisdictions such as Estonia have successfully employed this technology, to enhance the transparency, efficiency and security of their public and justice administration systems (Martinovic *et al.* 2017, p. 2).

6.1.2 Public vs. Private Blockchains

It is important to note that not all blockchains are created equal, with respect to some of the features described above, including, immutability and tamper resistance. Essentially two types of blockchains exist – permissioned and permissionless / unpermissioned blockchains, also referred to as private and public blockchains respectively (Colomo-Palacios *et al.* 2020, p. 2). The Bitcoin blockchain is open source and public (Colomo-Palacios *et al.* 2020, p. 2). This

[156] Note that while anyone can submit a Bitcoin Improvement Proposal (BIP) to change the core bitcoin protocol, this would have to be accepted by 95% of the miners for it to be implemented. See more information here: https://galea.medium.com/bitcoin-development-who-can-change-the-core-protocol-478b8ac5fe43 [Accessed 30 May 2021]; With respect to the larger and more established public blockchains such as the bitcoin blockchain, individual participation in contributing to the blockchain may be somewhat hampered by the sheer computational power required to do so. As bitcoin has scaled it has become increasingly difficult for independent miners running even the best ASIC miners to contribute to the consensus. In practice miners will join "mining pool" by contributing their computing power to the pool, after which the profits are shared among the contributing members according to the computing power contributed. See more information here: https://www.masterdc.com/blog/how-to-mine-bitcoin-beginners-guide-to-mining/ [Accessed 30 May 2021].

means that anyone should be able to access the network, verify block transactions and thus contribute to consensus in the network (Redman 2017; Annamalai 2017). In public blockchains, *Proof-of-Work,* and the more energy efficient *Proof-of-Stake or Delegated Proof-of-Stake* are the most common consensus algorithms deployed in the validation of transactions by the network (Ussatova *et al.* 2022, p. 19). *Proof-of-Work* based blockchains are more energy intensive as all nodes compete to add a block to the blockchain by finding a one-time number referred to as "nonce" (number used only once) by simply using computational power (Ussatova *et al.* 2022, p. 19; Ghiro *et al.* 2021, p. 4). *Proof-of-Stake* consensus protocols enable parties to validate transactions not on the basis of computation power contributed to the network, but on an amount of virtual or cryptocurrency the participant holds and "stakes"[157] on the network (De Filippi and Wright 2018, pp. 31-32,231). The rationale is that the greater the stake one has in the blockchain, the greater their incentive to "protect" the blockchain (Ussatova *et al.* 2022, p. 19). Permissionless or public blockchains are therefore censor-proof platforms where hypothetically, any user can join and interact with the network without restrictions so long as they follow the platform's rules (Redman 2017; Annamalai 2017; Colomo-Palacios *et al.* 2020, p. 2).

Permissioned or private blockchains however restrict actors who can access the network and contribute to the consensus (Redman 2017; Annamalai 2017). Such actors would need to be identified and approved before they can participate in validating and building the network's chain (Datta 2021, p. 192). Their trust model is therefore based on the authority of trusted peers who control access to the blockchain rather than the *Proof-of-Work,* or mining based consensus algorithms – as they do not require a large network of nodes / miners to maintain the blockchain (Martinovic *et al.* 2017, p. 6; Atzori 2015, p. 19). Instead, they tend to employ the *Byzantine Fault Tolerance* (implemented by Hyperledger Fabric to be discussed below),[158] *Federated Byzantine Agreement (FBA)*, *Proof of Elapsed Time (PoET)* among other algorithms (Leilacher 2017; Ussatova *et al.* 2022, p. 19; Karanja 2018, p. 8).

Private blockchains come in one of two iterations, the *consortium-based blockchain,* or the *fully-private blockchain* (Martinovic *et al.* 2017, p. 7). The consortium-based private blockchain is usually run by entities such as governments and banks which trust each other and share a stake in the governance of the network (Martinovic *et al.* 2017, p. 7). A typical rule of the consortium would be that *x* number of the membership would need to validate or sign every

[157] Refers to a way of earning rewards by holding or "investing" ones cryptocurrency on a blockchain.
[158] See explanation here: https://wiki.hyperledger.org/display/LMDWG/Byzantine+Fault+Tolerant+Consensus [Accessed 15 August 2022]

block for it to be considered authentic and added to the blockchain (Martinovic *et al.* 2017, p. 7). The private consortium may, or may not chose to publish these logs on the blockchain with or without the original or source data (Martinovic *et al.* 2017, p. 7). This means the consortium may choose to allow public access to the root hashes, original data, or both, or it may choose to restrict such access to a select audience (Martinovic *et al.* 2017, p. 7). The implementation of (Guardtime's) KSI blockchain in the administration of Estonia's public records has opted for a model where the public only has access to the hash information and not the original files linked to the blockchain (Martinovic *et al.* 2017, p. 7). These blockchains are therefore by definition more decentralized than the fully-private blockchain, which is typically controlled by a single organization, as they will normally allow for public or stakeholder access to cryptographic proof on the status of the blockchain (Martinovic *et al.* 2017, p. 7).

This thesis therefore proposes the consortium private blockchain model, with justice sector actors or institutions as the trusted owners in the administration of justice in Kenya, and with public access enabled to verify the status of the "justice-chain". This is because their limited or closed nature also makes it far easier to coordinate action and decisions that support the efficiency of the network (Martinovic *et al.* 2017, p. 7; Atzori 2015, p. 19). Arguably, consortium blockchains are also preferable as the risk of 51% attacks by rogue colluders is mitigated by the fact that its members are trusted and known (Martinovic *et al.* 2017, p. 7; Belchior *et al.* 2019, p. 2). Atzori also notes that these blockchains can be employed to matters of interest or relevance to the implementing parties and therefore their networks do not have to be encumbered by the speculative verification mechanisms such as cryptocurrency reward schemes (Atzori 2015, p. 19). Private blockchains also tend to have a higher throughput rate than public blockchains as they do not rely on the computationally intensive *Proof-of-Work* consensus mechanisms (Atzori 2015, p. 19).

Despite generally providing a better efficiency model than the public blockchain, private blockchains have been criticized by techno-libertarians for compromising the core tenets of decentralization, censorship resistance or immutability and open innovation (Atzori 2015, p. 20; Colomo-Palacios *et al.* 2020, p. 2). Private blockchains are more susceptible to attacks targeting the trusted peers who control access to the network, resulting in the erosion of the immutability guarantees that can be offered (Martinovic *et al.* 2017, p. 7). For the foregoing reasons, a popular view among blockchain purists is that permissioned blockchains cannot be blockchains in the strict sense as they comprise on the original core tenets of decentralization and immutability, as outlined by the Satoshi White paper, to make them more suitable for enterprise (Martinovic *et al.* 2017, p. 7; Ghiro *et al.* 2021, p. 12). They argue that private

blockchains (such as HyperLedger Fabric, HyperLedger Sawtooth, Amazon Managed Blockchain and Azure Blockchain) are instead *"distributed databases enhanced by standard cryptographic primitives"* (Martinovic *et al.* 2017, p. 7; Ghiro *et al.* 2021, pp. 12, 16). In fact Exp-Blockchain, a self-professed purist notes that:

> *"…the best blockchain solutions are open and interoperable… one can start with hyperledger and migrate to the better system with time."*

Jalakas argues that public blockchains are better suited to e-governance and e-participation by virtue of the public and transparent properties of these blockchains (Jalakas 2018, p. 35). He further notes that with the public blockchain, public participation can be incentivized through tokenization, or rewarding e-participation (Jalakas 2018, p. 35). However as will be seen below, public blockchains present a major challenge to widespread adoption due to the large amounts of energy required to meet their computational demands. Public blockchains also require complex protocols to incentivize cooperative behaviour across a large spectrum of participants (Martinovic *et al.* 2017, p. 6). They also present unique challenges in decision making, due to the widespread consensus required, including on changes to the underlying protocols, as illustrated by the *Segwit* debate discussed in Section 6.3 (Martinovic *et al.* 2017, p. 6).

The sections that follow undertake a closer examination of the workings of blockchain, as well as the distinct categories of the technology, the different phases of development that they represent, and their various applications in the "real" world.

6.1.3 The "Mechanics" and Uses of Blockchain as a Governance Mechanism

This consensus mechanism pioneered by Nakamoto overcame one of the most challenging problems brought about by disintermediation, that is coordination of action or reaching consensus in the absence of trust, also referred to as the *Byzantine Generals' Problem* (Lamport *et al.* 1982; Swan 2015, p. 2). This hypothetical situation refers to "Byzantine Generals" who are separated by space in the context of battle, and need to arrive at a tactical consensus on whether to advance or retreat through the use of couriers, without tipping off ill-intentioned actors in their midst (Wright and De Filippi 2015, pp. 5-6; Karanja 2018, p. 7). In the same way, Nakamoto's challenge was to come up with a way for "honest" nodes or actors within the network to agree or arrive at a consensus, on the validity and sequence of transactions within the network, which he did through the probabilistic *Proof-of-Work* algorithmic protocol (Nakamoto 2008). Once this chain and its validity has been verified the transaction is then timestamped or "hashed", and published on a tamper resistant or immutable ledger, consisting

of the verified "blocks" of transactions, in a process referred to as "mining" (Nakamoto 2008, p.3). Martinovic *et al.* describes *cryptographic hash functions* as ;

> *"security primitives that provide a compact representation of data (called hash value) while making it practically impossible for an attacker to change the data without changing the hash value."* (Martinovic *et al.* 2017, p. 3)

Mining therefore serves the dual purposes of: (i) adding new blocks to the blockchain, and (ii) generating new bitcoins or cryptocurrency as an incentive or reward to those who expend their computing power towards this "work" (Martinovic *et al.* 2017, p. 4; Nakamoto 2008, pp. 2-3). The other nodes in the network signal their authentication of the block by working towards creating the next block of transactions (Nakamoto 2008, p.3). The technology ensures that a block contains a reference of the previous block in its hash value, which facilitates the chaining of blocks as an immutable ledger of transactions (Martinovic *et al.* 2017, p. 4). ***Illustration 28*** below provides a simplified visual representation of this "hashing" process:

Illustration 28: Simplified Illustration of Hashed Blockchain Transactions

Source: Derived and adapted from various illustrations[159]

[159] See examples here: Marcela Tuler de Oliveira; Aurélio Buarque ; Israel Miles [Accessed 12 August 2022]

Martinovic *et al.* (2017) also note that two properties make the hash value a particularly robust integrity or immutability feature. The first that it cannot be replicated, therefore eliminating any chances of hash collisions, and secondly the original data cannot be extracted from the hash (Martinovic *et al.* 2017, p. 3).

As the blockchain lengthens therefore, it becomes increasingly difficult for "dishonest" nodes (also referred to as rogue or corrupt nodes) in the network to carry out a 51% "replay attack" or to replicate, reverse or otherwise manipulate the record of transactions (Martinovic *et al.* 2017, p. 5). To achieve this, they would have to master an overwhelming amount of "hash" or computational power to alter the sequence of the entire blockchain (Nakamoto 2008, p.3; Jalakas 2018, p. 18; Martinovic *et al.* 2017, p. 5).

Taking the foregoing into account, a blockchain can therefore be described as a public and encrypted distributed ledger or database of transactions, owned by no singular entity, that is verified, updated, and published by independent miners within a P2P network (Swan 2015, pp. x, 1). In simpler terms and as depicted by the illustration above, blockchain has been described as a;

> *"…technology of constructing specific types of distributed databases composed of immutable blocks of data, each containing a list of transactions and a unique reference number to its predecessor block."* (Martinovic *et al.* 2017, p. 2)

Blockchain technology therefore implements an alternative form of governance which either bypasses or reconfigures the role of hierarchies. Beyond its crypto-currency or "Bitcoin" use-case, blockchain offers a decentralized "trustless" model for coordination and decision-making or "transacting", to mitigate against the risk posed by the centralization of trust in sub-optimal entities such as banks and governments, which are viewed as "single points of failure" (Jalakas 2018, pp. 17-18; Atzori 2015, p. 6).

The spectrum of applications that can be enabled by the blockchain can be put into four categories (Swan 2015, p. ix; Colomo-Palacios *et al.* 2020, pp. 2-4). Bitcoin and other decentralized currency applications belong to the first category of applications and are referred to as *Blockchain 1.0* applications (Swan 2015, p. ix, 9; Colomo-Palacios *et al.* 2020, pp. 2-4).

The second category is *Blockchain 2.0* applications which comprise platforms, that facilitate the decentralization of markets through self-executing contracts (smart contracts) stored on the blockchain (Swan 2015, p. ix, 9; Colomo-Palacios *et al.* 2020, pp. 2-4). It has been acknowledged that currently, no universal definition for smart contracts exists, however some

working definitions apply including; code containing "arbitrary programmatic logic" (Maesa and Maori 2020, p. 101), or "a computerized protocol that executes the terms of a contract" (De Caria 2020, pp. 21,22l). Contractual terms or conditions fulfilled by smart contracts may include, "payment terms, liens, confidentiality and even enforcement" (De Caria 2020, p. 22).

Gatteschi *et al.* write that the idea of smart contracts is not new, but has been mainstreamed with the emergence of blockchain technology, as smart contracts stored on the blockchain can be secured, inspected and verified by those with the technical capacity to do so (Gatteschi *et al*. 2020, p. 42).

The Ethereum blockchain, a blockchain 2.0 platform,[160] has to date, done the most towards expanding this use-case of blockchain, by creating a platform for building and deploying decentralized applications or *dapps*, enroute to putting the "nation on the blockchain" (Atzori 2015, p. 8; Rosic 2016). *Dapps* are computer programs that apply smart contracts without the need for intermediation (Wright and De Filippi 2015, p. 9; Rosic 2016). Dapps have also been described as web applications on which the smart contact code is run, instead of using traditional centralized servers which can be a single point of failure (Gatteschi *et al*. 2020, p. 45). Dapps would continue to function even if one node is faulty or unreachable, as they are replicated on all blockchain nodes (Gatteschi *et al*. 2020, p. 45). Smart contracts can potentially go beyond simple contract applications to encoding even more complex rules that manage groups of people or organisations without the need for external governance mechanisms i.e. Decentralized Autonomous Organizations [DAOs] (Gatteschi *et al*. 2020, p. 45). The discussion to follow on *Hyperledger Fabric*, will be illustrative in this regard.

The goal of platforms such as Ethereum therefore, is to facilitate DAOs run by a collection of smart contracts on the blockchain (Wright and De Filippi 2015, p. 39). In this new paradigm which is still a long way from realization, people can hypothetically reconfigure their state or other boundaries, to directly transact with each other across different nations and define the rules by which they choose to be governed (Wright and De Filippi 2015, p. 39).

In current real-world applications however, the business processes of the participants within the network are programmed into the smart contract, and monitoring of the transactions on the network would require the coordination and approval of all the participants in the network (Vo *et al.* 2018, p. 447). Access to the data of the distributed ledger is also determined by the rules governing the transaction, written into the smart contract (Vo *et al.* 2018, p. 445). In essence,

[160] See Ethereum website here: https://ethereum.org/en/ [Accessed 7 February 2021]

smart contracts enable the rules of the network to be enforced by its participants on each other, who all have the responsibility of ensuring that the correct steps being taken through the workflows. [161]

These platforms are innovative because the regulation of the transactions and contractual obligations is governed not by bureaucrats or lawyers or other institutions, but by code, also referred to as Lex *Cryptographica* (Wright and De Filippi 2015, pp. 10-11). Smart contracts, also called multi-signature contracts employ multiple signatures/keys or multi-signature protocols[162] to execute transactions.[163]

Smart contracts will therefore be very relevant to the case management use-case discussed in this Chapter, as they potentially enhance the efficiency and flow of justice processes through the justice chain. Dini *et al.* note that the automation of smart contracts could potentially save the government resources as various rules and triggers (e.g. on action timelines) will be translated into code and would prevent delays occasioned by bureaucratic processes including requests for information (Dini *et al.* 2018, p. 3).

The discussion to follow shall also examine how this application of blockchain and smart contracts to case management and e-justice could potentially revolutionize the balance of power in the administration of justice. It will show how multi-signature (*multisig*) protocols based on "control protocols" borrowed from the paper-based era (Szabo 1997), could potentially provide checks and balances to the coercive power of the State, by enabling multiple parties to authenticate or verify justice related transactions such as: the payment of a fine, cancellation of passport, or the sale of a property provided as bond upon the violation of bond terms. Such an innovation could be the key to rebalancing the scales of power from a "human design or court user's justice needs" perspective. It would do so by moderating or mitigating the unwarranted exercise or abuse of power by the State, in cases where it would otherwise make unilateral decisions with unfair or unjust outcomes. *Multisig* protocols are therefore an important tool in enabling decentralized decision-making – but also for providing greater oversight over the records of cases by interested stakeholders.

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[161] See Hyperledger blog: https://www.hyperledger.org/blog/2018/06/12/how-blockchain-is-reinventing-business-process-management [Accessed 22 August 2022]

[162] Protocols or digital signature scheme employing public and private keys, that require multiple parties or keys to authorize a transaction or sign a document. See definition here: https://en.wikipedia.org/wiki/Multisignature [Accessed 8 February 2021]

[163] See explanation here: https://medium.com/mycrypto/introduction-to-multisig-contracts-33d5b25134b2 [Accessed 17 February 2021]

The third category belongs to *Blockchain 3.0* applications that go beyond currency, economics and markets and improves on Blockchain 2.0's capabilities by enabling more scalable, cost-effective and efficient transactions, that would enable blockchain-based applications to truly compete with traditional or legacy systems such as Visa or Paypal (Swan 2015, p. ix, 27; Colomo-Palacios *et al.* 2020, pp. 2-4).[164] *Blockchain 3.0* applications impact the areas of governance, health, the arts among other spheres of social life. (Swan 2015, p. ix; Colomo-Palacios *et al.* 2020, pp. 2-4).

Blockchain 3.0 applications have the potential to create the mechanism through which matters pertaining to freedom, jurisdiction, and censorship are addressed more equitably through transnational organisations (Swan 2015 p. 30). Creating these applications entails employing all the beneficial properties of blockchain's decentralized governance mechanism, as well as its other innovative properties such as smart contracts and cryptocurrencies into systems built on top of the technology to bring about enhanced scalability, interoperability, sustainability, and governance (Maesa and Maori 2020, p. 99; Colomo-Palacios *et al.* 2020, p. 3). These systems include: electronic voting and identity management, supply chain management, intellectual property protection, health care management, decentralized notary, energy trading, online social networks among many others (Maesa and Maori 2020, p. 100).

Finally, an emerging category of blockchain applications are referred to as *Blockchain 4.0* applications which entail the integration of Artificial Intelligence (AI) with blockchain, to enhance the scalability, flexibility, and usability of these applications (Colomo-Palacios *et al.* 2020, pp. 2-4). These latter applications may have a role in the justice sector e.g., in the enhancing and scaling of non-custodial sentences or measures through electronic monitoring devices, thus reducing the need for human management (Colomo-Palacios *et al.* 2020, pp. 3-4). In this regard, electronic monitoring and tracking devices, can be connected to the blockchain (device governance), potentially with the aid of Artificial Intelligence (AI) to enable decentralized monitoring of the adherence of the offender or accused person, to the conditions of his bail, parole or other early release (De Filippi and Wright 2018, pp. 160-161).

The first three iterations of blockchain applications can be described as the new building blocks of economic governance comprising:

> *"...platforms for building bespoke economic coordination using distributed ledgers augmented with computationally embedded features such as programmable money*

[164] See also: https://www.bbntimes.com/technology/everything-you-need-to-know-about-blockchain-3-0 [Accessed 30 May 2021]

(cryptocurrencies), programmable contracts (i.e., smart contracts), and organisations made of software (DAOs). (Davidson *et al.* 2016, p. 8).

For these reasons, blockchain technology is also seen as a key vehicle for facilitating the Coasean Collapse, and the emergence of government 2.0 or government as a platform, as discussed in Chapter Two.

The discussion in Chapter Five highlighted key areas that technology ought to target so as to "open" the justice sector in Kenya, and mitigate the high transaction costs in the policy-making and implementation process. These factors broadly included enhancing the assimilation of the broad national or constitutional values of transparency, accountability, democracy, and social justice in these processes. Operational factors such as adequate facilitation e.g., interagency coordination mechanisms were also seen to be critical to the delivery of justice. This thesis shortly explores how blockchain can address some of these gaps within Kenya's criminal justice system through its application in electronic or automated case management.

The discussion shall commence with the contextualization of electronic case management within the wider context of Business Process Management. In this regard, the role of blockchain of enhancing the management of workflows in the wider public sector and industry shall be briefly described. The application of blockchain in the management of justice chain interactions during criminal trials shall then be examined, starting with limitations of the technology in this narrow context. This discussion then progresses to blockchain's potential role in integrating values of ethical importance to the justice process through case management. These values include: transparency, accountability, access to justice, social justice protections such as privacy, participation and coordination, and enhanced security and data integrity. In undertaking this discussion, actualized and proposed blockchain applications are examined and critiqued in assessing the potential for blockchain-based case management in Kenya.

6.2 Potential Benefits of Blockchain Technology to Case Management in Kenya

The discussion on the automation of case, records or information management takes place within the wider discussion on Public Management as discussed in Chapter Three, and in particular Business Process Management [BPM] (Petroni and Pfitzner 2021; Viriyasitavat *et al.* 2019).

6.2.1 Electronic Case Management in the Context of Business Process Management

BPM has been defined as:

> *"…an approach to identify, design, execute, document, measure, monitor and control both automated and nonautomated business processes to achieve consistent, targeted results aligned with an organization's strategic goals."* (Viriyasitavat *et al.* 2019, p. 1420)

BPM therefore defines processes, procedures, routines and related responsibilities (workflow), as well as governance protocols to address organisational productivity and operational efficiency (Petroni and Pfitzner 2021, p. 165). The documentation of these processes provides not only clarity but also enhances the visibility of these operations enabling greater oversight by managers and duty bearers (Petroni and Pfitzner 2021, p. 166).

There has been a call by various authors to have traditional BPM tools updated including through integration with blockchain, to meet the emerging needs of enterprises, as well as those of the public sector (Petroni and Pfitzner 2021; Viriyasitavat *et al.* 2019). This has become even more necessary as the emphasis from a business profit, and public sector oversight standpoint has shifted from internal processes,[165] to collaborations and integrations between external parties (Petroni and Pfitzner 2021, p. 154; Viriyasitavat *et al.* 2019, p. 1424). Petroni and Pfitzner argue that the integration of organisational systems leads to greater operational efficiency as it mitigates information asymmetries between government and citizens as well as among government agencies (Petroni and Pfitzner 2021, pp. 154, 158-159).

Blockchain technology enables collaboration across multiple untrusting parties performing various transactions, which are validated by smart contracts that choreograph or model the workflow of these parties or organisations, without the need for intermediation (Viriyasitavat *et al.* 2019, pp. 1423, 1425). The discussion on the *Hyperledger Fabric* private blockchain to follow highlights how the platform's architecture enables such cross-agency collaboration through the deployment of smart contracts. In this latter respect, blockchain is deployed as a communication layer for BPM by leveraging on the auditability of the blockchain and smart contracts stored on the blockchain to automate workflows when certain trigger conditions written into the smart contract are met (Datta 2021, p. 192).[166]

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[165] See here: https://www.hyperledger.org/blog/2018/06/12/how-blockchain-is-reinventing-business-process-management [Accessed 21 August 2022]

[166] See further explanations on the Hyperledger and smart contracts here: https://www.hyperledger.org/blog/2018/06/12/how-blockchain-is-reinventing-business-process-management; https://www.ibm.com/topics/smart-contracts [Accessed 21 August 2022]. Note also that it is not necessary to have blockchain to use smart contracts.

Viriyasitavat *et al.* view the adoption of blockchain in industry as, for instance, enhancing the verification of transactions, so as to eliminate fraudulent insurance claims and enhancing supply chain management (Viriyasitavat *et al.* 2019, pp. 1420,1421). Petroni and Pfitzner on the other hand propose the adoption of blockchain for BPM in Brazil's public sector, which like Kenya is fraught with principal-agent challenges, including the erasure of files by bureaucrats as they exit their roles (Petroni and Pfitzner 2021, p. 157). Blockchain is therefore proposed by the authors to reduce this principal-agent conflict, enhance data security and foster a culture of fairness in the provision of public services (Petroni and Pfitzner 2021, p. 157).

In the context of the justice sector, electronic or automated case management systems have in recent years, been the main tool adopted for managing justice chain interactions or case-flow, around the court process. The discussion below defines some of the core features of an electronic case management system and elaborates on how blockchain and smart contracts can enhance them.

6.2.2 Components of an Electronic Case Management System

An ideal Electronic Case Management System (ECMS) should be responsive to the needs of its users including through user-friendly interfaces, it should also enable quality data collection, data analysis, data sharing or data flow and facilitate decision making (NCAJ 2019, p. 6). As noted in previous Chapters, the absence or lack of reliable justice sector data has historically contributed to the lack of integrity and inefficiency in Kenya's justice sector.

The core components or modules of ECMS are: automated workflow processing; role-based access for user management; electronic filing (e-filing) and online case data entry; form and field generation to enable the design and management of data entry forms; legal template and document management; collaboration messaging and notifications; calendar and task management, advanced analytical reporting; audit trail; API gateway and integrations that enable access and interoperability with other users or consumers of justice sector services; data import/export capabilities; and the use of AI for case allocation (Watson and Matevosyan 2021, pp. 6-7).

The Judiciary of Kenya has, as of early 2022, implemented; e-filing in 15 out of 128 court stations, the Case Tracking System in all 128 court stations, court recording and transcription in 32 out of 654 court rooms and digitized court files in 3 out of 47 counties (UNODC 2022). At the time of completing this thesis, the module of e-court fees management had been implemented to enable parties to pay to fees online and obtain an e-receipt, though some challenges in the seamlessness of these processes persist.

Illustration 29 below depicts the Judiciary's Enterprise Architecture, which SenJud-ICT describes as a roadmap of all the Judiciary's integrated court management systems. It illustrates: its user / client access interfaces; the communication modules; its case management system modules (e-court); its finance and human resource administration components; e-payments; integration APIs with other justice sector agencies such as the police and the prosecution; and the base infrastructure architecture.

Illustration 29: Judiciary of Kenya's Integrated Court Management System

Source: Judiciary ICT Master Plan 2018 – 2022[167]

As noted in Chapter Five, the Office of the Director of Public Prosecutions (ODPP) has also implemented the Uadilifu Case Management System which has five modules: e-filing; document tracking; case tracking; e-disclosure; and e-reporting (UNODC 2022). So far the Uadilifu system (which translates to the *Integrity System*), has been integrated to the Judiciary's

[167] See Judiciary ICT Master Plan 2018-2022 p. 26. Available at: https://www.judiciary.go ke/download/judiciary-ict-master-plan-2018-2022/ [Accessed 7 August 2022]

Case Tracking System countrywide, and e-filing in Nairobi, and plans are underway to roll it out to the other 47 counties in Kenya.

The discussion in this chapter will focus on how blockchain can strengthen some of the modules described above, such as those that facilitate audit trail, reporting, collaboration and human resource / performance management, towards enhancing and further entrenching OAO values into the heart of the management of justice processes in Kenya.

This value-centered approach is also consistent with that adopted by nations such as Estonia in deploying blockchain and other technologies in their public sector. In this regard, Exp-Egov/Estonia explained that prior to the implementation of blockchain in Estonia, there was much discussion among stakeholders on the "values" that the technology can bring to the public sector. The expert noted that ultimately it was decided that, transparency, integrity and security were the most important values, so the various information systems were classified taking into account those values.

The discussion in Chapter Five also made several findings with respect to the implementation of electronic-CMS in Kenya. The discussion also found that prior to the COVID-19 pandemic, the least used technology across all agencies was ECMS and Integrated Electronic Case Management Systems (IECMS). It also emerged that the COVID-19 pandemic played a critical role in progressing the adoption of ECMS by individual agencies and the sector as a whole. The overwhelming perception among respondents was that ECMS would enhance the administration of justice in various ways including by; enhancing interagency coordination, safe custody of records, reducing bureaucracy, related costs and gaps such as in monitoring recidivism, and enhancing transparency and accountability. It was further noted that lack of coordination and cooperation within the sector had been a major hindrance to the adoption of IECMS.

Chapter Five further revealed that the participation of agencies at the center of court operations such as the Judiciary and Prosecution, and the coordination body (NCAJ), would be critical to the successful implementation of IECMS. Chapter Five also concluded that capacitation of users, provision of the base infra-structure including adequate cyber-security and a robust legislative or regulatory framework would be critical to the success of ECMS in Kenya.

This chapter examines how the attributes of blockchain can enhance electronic case management during criminal proceedings, taking into account some of the observations and gaps identified in Chapter Five.

6.2.3 Limitations of Blockchain as a Case Management Tool

Ahead of reviewing these benefits, it is important to first acknowledge some of the current limitations of the technology. De Filippi and Wright (2018), as well as blockchain expert Exp-Blockchain point out its unsuitability for the storage of data due to its structural limitations, and the added expense and inefficiency of this use-case. Exp-Blockchain further observes that blockchain is (currently) most efficiently utilized as a record of immutable identifiers or references of documents or transactions, and should be used alongside traditional data storage solutions such as the InterPlanetary File System (IPFS).[168] Pisa also notes that the costs of permanently storing data on a growing blockchain will force organisations to adopt off-chain storage solutions (Pisa 2018, p. 2). However, the continued reliance on these legacy solutions adds to the complexity of managing and ensuring the security of this ecosystem (Pisa 2018, p. 2). In this regard, Datta explains that even in the case of the successful KSI blockchain in Estonia (discussed below), the blockchain may detect corruption of data stored off-chain in the "e-File" central filing system, but would not prevent or correct this interference, or the resulting violation of privacy (Datta 2021, p. 191). The "e-File" is an integrated data sharing system that:

> *"...provides an overview of the different phases of criminal, misdemeanour, civil and administrative procedures, court adjudications, and procedural acts to all the parties involved, including the citizen."*[169]

The e-File was created in 2005 upon the recognition of the need to break down *"information silos that worked independently from each other."*[170]

Exp-Blockchain also notes that blockchain cannot, at the moment serve as an effective data exchange layer solution. It will be seen in the Estonia example below that currently blockchain notarization and other services are implemented together with a legacy data exchange system known as "X-Road", to allow for the full automation and integration of systems.[171] Exp-Blockchain therefore recommends that in designing integrated systems for the public or criminal justice sector (such as IECMS), these systems should be implemented alongside traditional or legacy systems such as data storage solutions and data exchange layers.

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[168] IPFS is a peer-to-peer distributed file storage system for storing data and sharing hypermedia files over a network. See website: https://ipfs.io [Accessed 22 March 2021]
[169] Supra.
[170] See: https://e-estonia.com/solutions/security-and-safety/e-justice [Accessed 6 February 2021]
[171] See an overview of the Estonia's implementation of blockchain and on e-File and X-Road here: https://lina.network/how-has-estonia-applied-blockchain-technology-to-the-e-government-system/ [Accessed 6 November 2020]

Exp-Blockchain also cautions that the integrity of the data on the blockchain further depends on the integrity of the off-chain data sources and processes. The expert notes that while blockchain does have a clear benefit in enhancing the transparency and accountability of a given system, through its immutability among other features, it equally poses the danger of perpetuating injustices, by making the unjust or incorrect records permanent on the blockchain. Exp-Blockchain therefore notes that policy makers in the criminal justice sector need to put in place parallel mechanisms that ensure the integrity of the off-chain or human layers of the system. Pisa (2018) agrees with this position. He argues that the creation of blockchain-based land registries for instance, does not remove the need to trust the officials who upload the titles, nor does the blockchain guarantee the reliability of their inputs (Pisa 2018, p. 2). This thesis takes a similar position in recognizing that while technology can be, and is an important tool for enhancing governance, it is important that efforts are made in ensuring that all components of a governance system undergo similar reforms, based on a constitutional and values-oriented foundation.

Blockchain nevertheless remains useful in enhancing the various components of these integrated systems. In such a context, the primary benefits of blockchain from which most other benefits accrue is enhanced transparency, accountability, and security of the system. This in turn facilitates greater efficiency and access for court users through e-justice platforms, which results in better justice and social justice outcomes for the court users – especially justice seekers.

Exp-Blockchain notes that with respect to the public sector and in particular the criminal justice sector, blockchain at its current state of development can best be leveraged through three main use-cases described in greater detail below: (i) notarization or authentication of documents or processes – as a database or record of (linked) document identifiers or references, (ii) automation of routine or basic transactions such as e-payments for bail or fines and (iii) execution of smart contracts e.g. in the adjudication and enforcement of minor offences such as traffic offences. The application of blockchain-based case management systems to these use-cases are discussed in the sections to follow.

6.2.4 Enhanced Transparency, Accountability and Access to Information

Blockchain enhances transparency because, rather than individual institutions maintaining their own ledger of transactions, a single record or ledger of the transactions is shared or distributed across all relevant stakeholders (Killmeyer *et al.* 2017, pp. 5-6).

Dini *et al.* propose the use of blockchain to strengthen the Argentinian Criminal Records Information System, *Registro Nacional de Reincidencia* (RNR) which centralizes information on national penal processes (Dini *et al.* 2018, p. 2). They argue that one of the obvious benefits of blockchain to the RNR would be the decentralization of the information to more participants in the system (including permissioned international collaborators), therefore overcoming some of the historical challenges/transaction costs around access to information by certain categories of persons (Dini *et al.* 2018, p. 3). The availability of the information would further enable responsiveness and improve investigation and crime resolution timelines, it would also enhance data analysis that would further improve juridical and other processes (Dini *et al.* 2018, p. 3).

The "decentralization of governance" is therefore a core innovative contribution of blockchain technology, as multiple parties within a permissioned P2P network can verify or authenticate transactions such as; votes, ownership of value or even the status of cases or complaints on the criminal justice chain. While blockchain technology allows participants to access records of transactions within the network, and to verify the identities of those participating in the network, privacy is ensured through the obfuscation of identities using public and private keys (Lluis de la Rosa *et al.* 2017, p. 8).

De Filippi and Wright note that public-private key cryptography can also do away with the need to have written signatures requiring "paper instruments and contracts", by providing mechanisms for underpinning digital signatures resistant to forgery (De Filippi and Wright 2018, p. 15). In so doing, blockchain can be said to take on the function of the notary public whose role it is to authenticate and certify documents as proof of transactions or events that have taken place.[172]

Martinovic *et al*. outline that the process of authentication can be divided into two main classes; the first is the authentication of identity and secondly the authentication of origin or provenance (Martinovic *et al*. 2017, p. 3). Both these classes of authentication are integral to legal systems and processes, in particular the management of records pertaining to criminal trials. In this regard authentication plays an important role right from when a criminal complaint and the decision to charge is made, during the hearing phase of the case, and up to the point the case is finally determined and concluded by the court. This will be demonstrated by the discussions on implemented and / or proposed blockchain applications in case management in Estonia, China and India among other jurisdictions in the sections to follow.

[172] See the definition of Notary Public here: https://dictionary.law.com/Default.aspx?selected=1346 [Accessed 13 August 2022]

6.2.4.1 Notarization of Justice Sector Records in Estonia through Blockchain

Exp-Egov/Estonia explains that in Estonia, blockchain has been implemented alongside the e-File, as a mechanism for notarization or digital time-stamping of metadata on criminal justice records in a machine-readable form.

The expert notes the use of blockchain known as "Keyless Signature Infrastructure (KSI) Blockchain"[173], to ensure the integrity of the public sector data is facilitated by the law in Estonia. The KSI blockchain which is developed and maintained by a third-party service provider (Guardtime), [174] generates and maintains a ledger of transactions related to the country's public service (Martinovic *et al.* 2017, p. 8). KSI blockchain has therefore been integrated into Estonia's public registries including; its business, property, succession and digital court files registries (Martinovic *et al.* 2017, p. 8).

Exp-Egov/Estonia explains blockchain is implemented in the justice sector within an Integrated Electronic Case Management System (IECMS), which enables the exchange of data/files between parties through the aforementioned "e-File" [175], and its data exchange or interoperability layer known as "X-Road"[176] (Martinovic *et al.* 2017, p. 9). The system enables searches and communication between multiple government databases, and the transmission of large data sets between different entities (Martinovic *et al.* 2017, p. 9).

This system is therefore set up to enable an actor in the criminal justice system to create a document which is recorded and timestamped on the blockchain, and centrally filed in the e-File system. The e-File then integrates with the X-road to connect to systems of justice sector actors such as; *"courts, police, public prosecutors, prisons, lawyers and ordinary citizens"* (Martinovic *et al.* 2017, p. 9).

Another actor in the justice chain could then use the interface / portal of their department or agency's information management system (a judge in Estonia would use the Court Information System), to look up the reference and metadata of a record on the blockchain. The actor would then use the "X-Road" data exchange layer to recall the document from the "e-File". ***Illustration 30*** below shows how KSI blockchain and X-road interface with the public sector institutions including the justice sector.

[173] See more in KSI Blockchain here: https://m.guardtime.com/files/KSI_data_sheet_201509.pdf; https://guardtime.com/timestamping [Accessed 14 August 2022]
[174] See Guardtime's role here: https://digiexpo.e-estonia.com/Solutions/guardtime-ksi-blockchain-stack/; https://showroom.demos.guardtime.com/1-ksi-stack html -[Accessed 15 August 2022]
[175] See user interface here: https://www rik.ee/en/e-file [Accessed 13 August 2022]
[176] See more information on X-road here: https://e-estonia.com/solutions/interoperability-services/x-road/ [Accessed 13 August 2022]

Illustration 30: Depiction of Public Sector Implementation of KSI Blockchain and X-road in Estonia

Source: Guardtime (Martinovic et al. 2017, pp. 8-9).

Exp-Egov/Estonia notes that this set up ensures that: (i) information on the system is up to date, (ii) any unwarranted activities are tracked and flagged immediately, and (iii) coordination or integration of the different agencies across the justice chain is enhanced.

KSI blockchain provides a *signature service* or digital time-stamping (notarization) of transactions on the blockchain through the transmission of hash values (Martinovic *et al.* 2017, pp. 9, 11). This creates "proof of existence" of a piece of digital information or transaction on the blockchain and facilitates the verifiability of records (Martinovic *et al.* 2017, pp. 9, 11). It should be noted that while users of this service transmit a hash value of the asset (document, evidence etc.) or transaction to the blockchain, and in-turn receive a signature token as proof of this transaction, none of the original data of the user is transmitted, neither is it stored on the blockchain (Martinovic *et al.* 2017, pp. 9, 11). Martinovic *et al.* further note that none of the original data can be deciphered from the stored hash values – which is especially critical in this case as the service is provided by a third-party entity (Martinovic *et al.* 2017, p. 12). Estonian courts use this service to protect their data by writing their hashes onto the blockchain (Martinovic *et al.* 2017, p. 10). This guarantees that the record of the transaction cannot be deleted without detection, thus ensuring transparency and the integrity of the data (Martinovic *et al.* 2017, p. 10). Kenya stands to benefit from borrowing this Estonian (hybrid) model, in the coordination of its criminal justice activities and the management of the sector's records.

Nevertheless, it has been argued that the storing of hashes only, may present access to information challenges, and implementors therefore need to ensure that the entire eco-system adheres to the principals of access to information (Martinovic *et al.* 2017, p. 15). In fact, this is a challenge the government of Estonia is currently preoccupied with solving. Exp-Egov/Blockchain states that while the public in Estonia can access the "hashed" data on their record, this data is not easily understandable or verifiable by ordinary people. Steps therefore need to be taken to ensure that the information stored on the blockchain is comprehensible to those with a basic education and basic computer literacy.

Tasnim *et al.* also propose a blockchain-based criminal record management system called the CRAB Protocol, that seeks to secure and authenticate justice related records on a decentralized network and enhance the accountability of users (Tasnim *et al.* 2018, pp. 296). Their proposed system is based on a data provenance architecture that ensures the immutability of the recorded transaction logs, privacy through encryption of the data, and decentralized cloud storage of the actual data (Tasnim *et al.* 2018, pp. 296). They emphasize the importance of removing the barriers to the fluidity of data flow between the law enforcement agencies responsible for ensuring national security, a factor which they acknowledge is caused by siloed databases (Tasnim *et al.* 2018, p. 295). They further note that the availability of accurate time-stamped records would enhance work of these law enforcement agencies (Tasnim *et al.* 2018, p. 295).

6.2.4.2 Notarization of Justice Sector Records in China through Blockchain

Chinese courts have scaled up the blockchain notarization and records management use-case, by implementing it in the authentication of digital evidence (Susskind 2019, p. 171). Chinese courts had in the past acknowledged that blockchains are:

> *"…difficult to tamper with or to delete...*" and are therefore *"…a reliable method to maintain the integrity of content uploaded to it.*" (Lu 2020, p. 109)[177]

In this regard, on 18 September 2018, the Hangzhou Internet Court announced the launch of the first judicial blockchain platform in China that addresses the usability and credibility problems associated with electronic evidence (Lu 2020, pp. 113-114). The platform enables the generation, transmission, preservation and submission of electronic evidence, in copyright, financial contract and internet service contract cases (Lu 2020, pp. 113-114).

The platform integrates a multiplicity of nodes in a blockchain consortium including; the court, notary office, judicial expertise center and a certification authority, that witness the recording

[177] Citing; Hangzhou Huatai Yimei Culture Media Co., Ltd v. Shenzhen Daotong Technology Development Co., Ltd. (Huatai v. Daotong), [Hangzhou Internet Court. 0192 Min Chu. No. 81, 2018]

of the processes listed above (Lu 2020, p. 114). The platform consists of three layers; (i) the user layer incorporating industry alliances, (ii) the "entire-chain-route" competence layer which includes authentication, certification, privacy protection, encryption, risk control etc. (iii) Judicial alliance layer that includes courts, forensic institutions and industry associations (Lu 2020, p. 114).

As depicted in the ***Illustration 31*** below, a registered user can search for copyright infringements of his/her work on a third-party website through the platform, and the hash values for the search procedure and associated infringements are recorded on the local servers of the judicial nodes (Lu 2020, p. 115). The user is then able to file a law-suit using this evidence on the Hangzhou Internet Court's Litigation Platform and submit the source files of the searches as evidence (Lu 2020, p. 115). In the future, this template could potentially also be adopted, for storing or even generating certain classes of evidence related to criminal cases e.g. cyber offences or banking fraud.

The goal of this platform therefore is to implement a "high trust ledger" that reduces many of the transaction costs associated with the reliance on digital or electronic evidence, while providing encryption protections for its users.

Illustration 31: Depiction of Court User Search on HZ JBCP Platform for Digital Evidence

Source: (Lu 2020, p. 115)

Some of the benefits of this system that have already been identified include enhanced access to justice for court users who do not have to physically visit industry organisations to access the required information (Lu 2020, p. 116). Courts also face lower transactions costs related to the processes involved in the authentication and notarization of records (Lu 2020, p. 116). Nevertheless this system relies on strict checks to ensure that flawed authentication systems do not join the blockchain consortium. This point goes to underscore Exp-blockchain's observation on the importance of the parallel controls on the human or off-chain layers of such systems. Notably however, a major benefit of this system despite its moderate impact on the credibility of digital evidence, has been its role in reducing the case load burden on China's justice system. It has been reported that 96% of the cases related to approximately 390 million pieces of digital evidence collected on the platform between September 2018 and June 2019, were either dropped or resolved (Lu 2020, p. 116). Such a result in Kenya would be ground breaking in dealing with the perpetual case backlogs[178], and would greatly mitigate the resources that have in the past been expended to manage this problem.

It should however be noted that the implementation of this system in China nevertheless presents risks and concerns that cannot be ignored. In fact, Tian Lu notes that the government has been conservative in the deployment of the technology – a choice considered prudent given uncertainty around the immutability of private consortium blockchains (Lu 2020, pp. 119, 120). Lu goes on to state that blockchain does not, even within this context, live up to its radical disruption and revolutionary promise – primarily as it is confined to the boundaries of the law, as the ordinary rules of evidence would predicate and structure its application (Lu 2020, pp. 119-120). Secondly blockchain in this context also does not provide a magic bullet solution it still relies on the human and off-chain layers of the network for an accurate or comprehensive interpretation of the chained data (Lu 2020, pp. 119-120).

6.2.4.3 Enhanced Accountability in the Administration of e-Payments

Blockchain could also potentially enhance the management of financial resources by the judiciary and other justice sector institutions. The revenues collected from the payment of fines and court fees to the Judiciary play a significant role in the running of Kenya's economy (Judiciary of Kenya 2021[a], p. 199). The 2020/22 SOJAR Report indicated that in that year, the fines collected contributed to 55% of the revenue collected by the Judiciary at Kshs. 1.46

[178] According to the 2021/22 SOJAR report, case backlog stood at 336,426 as of June 2022 in all courts. This represented a decline of 10% from the previous reporting period, which recorded a backlog of 374,540 cases.

Billion,[179] while fees contributed to 39% of the revenue collected at Kshs 1.03 Billion, the remaining 5% earned was attributed to the interest accrued and rents received (Judiciary of Kenya 2022, p. 220). While these figures may seem high, they represent a fraction of what ought to be accounted for due to losses incurred through corruption and the lack of proper accounting practices. Ringfencing these national sources of revenue is therefore a matter of critical importance, particularly for a lower middle-income country such as Kenya. The 2021/2022 SOJAR report however noted that the figures above represented a progressive increase in revenue collection over the years (Judiciary of Kenya 2022, p. 220). With respect to fines, there was a 16% increase in revenue from the financial year 2020/2021, an increase for 50% with respect to interests on deposits and a 26 % increase with respect to revenue from rents and other sources (Judiciary of Kenya 2022, p. 220). Notably, the report attributed this increase to *"the use of technology in case management and revenue collection,"* in addition to the rise in the number of court cases filed (Judiciary of Kenya 2022, pp. 220, 222). In this regard the report found that the use of online case registration and a cashless payment platform eliminated avenues for revenue loss (Judiciary of Kenya 2022, p. 220).

The Integrated Financial Management Information System (IFMIS) was rolled out to public institutions in 2003, to improve financial data information management in the public sector (OAG 2021, p. 34). The Judiciary Financial Management Information System (JFMIS) which will be integrated to IFMIS, and the Case Tracking System, (Judiciary's case management system), have been deployed to enhance deposit collection and accounting at the Judiciary (Judiciary of Kenya 2022, p. 223). The 2020/21 report of the Auditor General however noted with concern the persistent discrepancies between IFMIS and the financial statements of public institutions which include justice sector agencies (OAG 2021, pp. 34-35). The report attributed these discrepancies to intrinsic IFMIS weaknesses, as well as the continuation of manual or non-automated financial transactions (OAG 2021, p. 35). As a result of the lack of proper financial management, the report noted that Kenya lost Kes 6.475 trillion shillings in the year 2020/21 due to unsupported expenditure (OAG 2021, p. 36). This amounts to approximately a loss of USD 170 Million daily across the public sector. During the July 2019 launch of the Report of the Distributed Ledger Technology and Artificial Intelligence Taskforce, the Chairman of the Taskforce, Prof. Bitange Ndemo (also former Permanent Secretary at Kenya's Ministry of ICT) was quoted as saying:

[179] Approximately USD 126 Million.

> *"Ideally, everything happening within IFMIS should be seen in real-time. We shouldn't be asking questions after the money has left. Blockchain will allow for this to happen."*[180]

The integration of blockchain to IFMIS and JFMIS would therefore ensure that all logs of financial transactions such as e-payments of court fees, are auditable as they are published on the public or distributed ledger accessible to all users and participants in the network. This intervention would ensure that all those in the chain of custody of these resources and responsible for their management, (in particular senior managers), are held accountable. Chapter Five found that while transparency and accountability lagged behind other values in Kenya's justice sector, the accountability of managers was of greatest concern.

It has however emerged that the automation of e-payments and e-receipting has been one of the more challenging components in the automation of court systems,[181] due to frequent down times and the inefficiency of corresponding manual processes (Judiciary of Kenya 2021[a], p. 189). These system failures often result in the reversion to more corruption prone cash payment systems. Adding blockchain into this ecosystem may therefore add to the complexity of managing the system, particularly if the underlying infrastructural issues are not resolved first.

Nevertheless, the integration of blockchain with payment systems, or the enforcement of e-payment of fines or fees on the blockchain cannot, at this stage be said to be a pipe dream (Susskind 2019, p. 287). The recent announcement by *Safaricom* they are looking into integrating blockchain with their MPESA payment platform (that also integrates with JFMIS), demonstrates that this concept is entirely feasible.[182]

SenJud-ICT, also highlights the lack of clear guidelines on the assessment of court fees as a major contributor to the problem at the Judiciary, as it creates room for the unwarranted exercise of discretion by registry officials. Standardizing court fee assessment procedures on the blockchain through smart contracts, would limit the need for human intervention, and therefore enhance integrity and predictability for court users.

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[180] See media release and social media tweet here: https://tokenpost.com/Kenyan-Blockchain-and-AI-taskforce-recommends-CBK-to-consider-creating-digital-currency-2785; https://twitter.com/MoICTKenya/status/1154287886776377344 [Accessed 15 December 2022]

[181] Including during justice sector consultations such as; the *"Consultative Workshop between the Judiciary and ODPP on Automation"* held between 23-28 May 2022 (Report not published)

[182] See the CEO (the late) Bob Collymore interview excerpt here: https://medium.com/@davgit/is-safaricom-looking-to-get-onto-the-blockchain-a78da13e3af9 [Accessed 25 August 2022]; For an overview on M-PESA see Safaricom website here: https://www.safaricom.co.ke/personal/m-pesa [Assessed 2 January 2021]

6.2.4.4 Enhanced Accountability in Performance Evaluation

Blockchain could further enhance accountability in the administration of justice by enabling enhanced personnel evaluation and assessment linked to the management of cases. Chapter Five identified the lack of adequate personnel management and evaluation as a major hurdle to accountability within the justice system.

Electronic case management systems have "role-based access" modules that ensure effective user management including system access-permissions on the basis of the role or function of each user in the life cycle of the case (Watson and Matevosyan 2021, p. 6). In Rwanda, the Integrated Electronic Case Management System (IECMS) which is a single point entry for all justice sector (JRLOS) institutions has been successfully used for the past five years to track performance measures together with the Judicial Performance Management System [JPMS] (Karungi *et al.* 2022, pp. 4-5). Rwanda's IECMS tracks case backlog, on-time case processing times, rate of case adjournment and the case clearance rate (Karungi *et al.* 2022, p. 5). The system also enables court users to directly provide feedback and complaints (Karungi *et al.* 2022, p. 6).

Blockchain could potentially improve on these standard case management systems by providing intricate identity management systems that can be linked to the data captured on organisational information systems, pertaining to the staff member's role and everyday functions in the administration of justice (Maesa and Mori 2020, p. 105; Sifah *et al.* 2020, pp. 99530-34). Data analytics on these administrative functions provides a basis for personnel evaluation that enhances the accountability of judicial and other officers tasked with various actions in the management of cases.

In contrast to other centralized identity management systems, blockchain also enables a Self-Sovereign Identity (SSI) system which in theory gives the user greater control over his or her identity data (Maesa and Mori 2020, p. 105). This means that the staff member could have some say on how the data is used once they exit their organization, or alternatively, they could "transport" it to their next assigned role – a concept referred to as data portability (Maesa and Mori 2020, p. 105; Sifah *et al.* 2020, p. 99537).

BEMPAS is one such conceptualized blockchain-based, decentralized personnel management system, that incorporates: (i) an "ID-chain" which uses government issued identification documents to create a digital ID, (ii) a "behaviour chain" which captures data on employee behaviour from other management or organisational information systems, and (iii) a "credit chain" which uses game theory for decision-making pertaining to the "reward or punishment"

of the employee (Sifah *et al.* 2020, pp. 99532-37). This credit chain could include a monetary or non-monetary reward system such as recommendation for promotion.

It can be argued that this integration of personnel management with output data on the staff member's functional role on the blockchain provides more targeted and reliable data for their evaluation, and positive behaviour reinforcement through a credit-based reward system. It would also inform decision-making impacting the individual employee e.g., on training, investigations, career progression etc., as well as macro policy decisions on an organisational scale.

It should however be noted that valid concerns can be raised on the implications of providing organisations with so much power to harness employee data, as well as the likelihood of its abuse without the requisite protections being in place. Staff are also likely to perceive the solution as promoting a culture of surveillance in the workplace and could potentially react in one of two ways: resisting this solution or diverting their efforts towards "gaming" the system. Both these scenarios would inevitably negatively impact on staff productivity.

Also, the non-compatibility of the SSI identity management system to others already widely in use, or the unwillingness of governments and other organisations to accept a unified SSI approach would pose a threat to its widescale adoption (Pisa 2018, pp. 4-5; Datta 2021, p. 189). In this regard Datta notes that some of the largest digitalized systems such as those implemented in the European Union (eIDAS[183]), or India (Aadhaar managed by UIDAI[184]) or China's social credit system are not blockchain-based (Datta 2021, p. 189).

Another challenge to this use-case relates to the management of private-keys, which would require a degree of sophistication and ICT literacy from the users (Pisa 2018, pp. 2, 5). Finally, it is likely that this use-case would face considerable legal hurdles, particularly with respect to data security and privacy laws and regulations (Pisa 2018, p. 2).

Organisations should, when considering whether to adopt these or any other blockchain-based solutions determine whether simpler and potentially less expensive centralized solutions are a better fit for the problem that they are solving. In this regard, Pisa proposes an analytical model where blockchain is best deployed in cases where multiple parties are contributing data requiring long-term auditability (Pisa 2018, p. 3).

[183] Electronic Identification, Authentication and Trust Services
[184] Unique Identification Authority of India

Section 6.2.4 outlined the various proposed and actualized ways in which blockchain can be integrated with electronic case management systems to promote transparency, accountability and access to information, i.e. through the notarization of records, enhanced performance management and enhanced accountability in the management of e-payments. The sections that follow turns on how the technology supports other social justice protections, such as the values of privacy and participation, through its application in electronic case management.

6.2.5 Enhanced Social Justice Protections such as Privacy through Encryption

One cannot speak in absolute terms about the value of *transparency*, without considering the right to *privacy* of those vulnerable to exploitation or danger as a result of the disclosure of their data. We therefore need to examine how blockchain reconciles these "conflicting" values.

Exp-Blockchain notes that one of the human or people-centered or social justice considerations for designing an integrated system is the privacy of those whose data is recorded on the system. Exp-Egov/Estonia notes that these considerations were also at the center of the design of Estonia's e-justice system. In Estonia's implementation of blockchain, encryption ensures that even the administrators that manage the nation's centralized data exchange layer known as the X-Road, are unable to read the data exchanged on the system. Exp-Egov/Estonia further explains that logs on the X-Road are also timestamped using blockchain technology.

A notable feature of blockchain and its encryption properties is that the value of privacy can be implemented in tandem with other values which at first glance appear to be in conflict with the notion of confidentiality or secrecy, i.e. the values of transparency and accountability. In this regard, the transparency of the Estonian system is enhanced by the fact that all logs of the transactions or actions taken, or enquiries on the data are available for audit, and are immutably recorded on the blockchain. Blockchain therefore provides privacy or pseudonymous transactions for users, while simultaneously allowing for transparency and accountability within the network, by allowing private citizens, and other entities to access government data – also referred to as open data government (Jalakas 2018, p. 43; Cheng *et al.* 2017, p.1; De Filippi and Wright 2018, pp. 38-39).

6.2.5.1 Enhanced Protections for Complainants, and Special Protected Groups

An important area requiring special attention in the management of cases relates to the point of first contact with the justice system, that is, when a complainant, witness, victim or whistle

blower reports a case against an accused person. Complainants face unique transactions costs and are particularly vulnerable during this initial stage of the justice process. They would therefore need adequate protections that enhance their personal security and privacy. This is even more important when the accused person is a powerful entity such as the State, or in high stakes cases such as those involving murder or corruption.

The 2016 Criminal Justice Audit noted that the Kenya Police (NPS) are the gatekeepers of the Criminal Justice System (NCAJ 2016, p. 74). This means that they act as the key filtration mechanism of criminal complaints and therefore play an important role in determining the criminal cases that proceed or do not proceed to trial. In the recent past, this power has been somewhat rebalanced by conferring the Director of Public Prosecutions with the sole mandate to make the Decision-to-Charge.[185] However while this last intervention has been instrumental in preventing abuses such as the filing of poorly investigated cases, it may not be as effective in preventing the non-initiation of cases deserving of prosecution.

This creates potential avenues for corruption and bribery as those against whom complaints are lodged, can obstruct the filing of cases against them at this early stage in the criminal process. The 2018 National Ethics and Anti-Corruption Survey found that within the criminal justice sector, the service most prone to bribery is "follow-up with a police case" which accounted for 5.6% (and ranked fifth) in the category of bribery in the public sector (EACC 2019, p. 15). This was closely followed by "reporting a crime/writing as statement" with the police, "seeking police and protection" and "seeking a police abstract" which accounted for 4.0%, 4.0% and 3.2% respectively, of the cases of bribery in the public service (EACC 2019, p. 15).

The survey further found that within the public service, the National Police Service (NPS) placed third amongst the institutions most prone to bribery – only marginally less corrupt than the Registrar of Persons and public hospitals (EACC 2019, p. 16). These findings are also consistent with the findings in Chapter Five of this thesis in which the NPS consistency scored poorly on the values and integrity variables.

The handling of complaints against the State institutions of custody such as the NPS, the Kenya Prisons Service (KPS), and importantly institutions holding children in conflict with the law, present particular risks to complainants. The 2016 Criminal Justice Audit found that certain Children Remand Homes did not allow children in their custody, or in some cases their guardians to lodge complaints (without censorship) against the institution (NCAJ 2016, p. 255).

[185] See ODPP announcement here: https://www.odpp.go ke/wp-content/uploads/2022/03/DPP-has-sole-powers-to-make-the-Decision-to-Charge-2.pdf [Accessed 22 August 2022]

In certain cases, complaints by prison / remand detainees to external agencies were also extensively screened (NCAJ 2016, p. 326).

The Audit further found in 2013/14 complaints to the Independent Policing Oversight Authority (IPOA)[186] implicating the Police in unlawful deaths in Nairobi and the surrounding areas were 14 (NCAJ 2016, p. 271). This figure drastically shot-up to 50 in the following reporting year (NCAJ 2016, p. 271). The Audit however noted that more comprehensive national data on unlawful deaths due to police action or while in police custody was missing (NCAJ 2016, p. 271).

It however clear that unlawful police deaths do occur, even in cases where formal complaints have been lodged against the police, as anecdotally illustrated by the recently concluded *Willie Kimani* case.[187] This case involved the filing of a criminal complaint against police, as a result of injuries caused during an unlawful arrest, of a *bodaboda* (motorbike taxi) rider. This complaint resulted in the abduction and extrajudicial killing of the complainant (Josephat Mwendwa the injured *bodaboda* rider), his lawyer (Willie Kimani), and their taxi driver (Joseph Muiruri), on 23rd June of 2016 by the accused police officers. While this is one of the few cases that resulted in convictions,[188] it highlights the dangers that exist for those seeking to take on State entities for the violation of their rights.

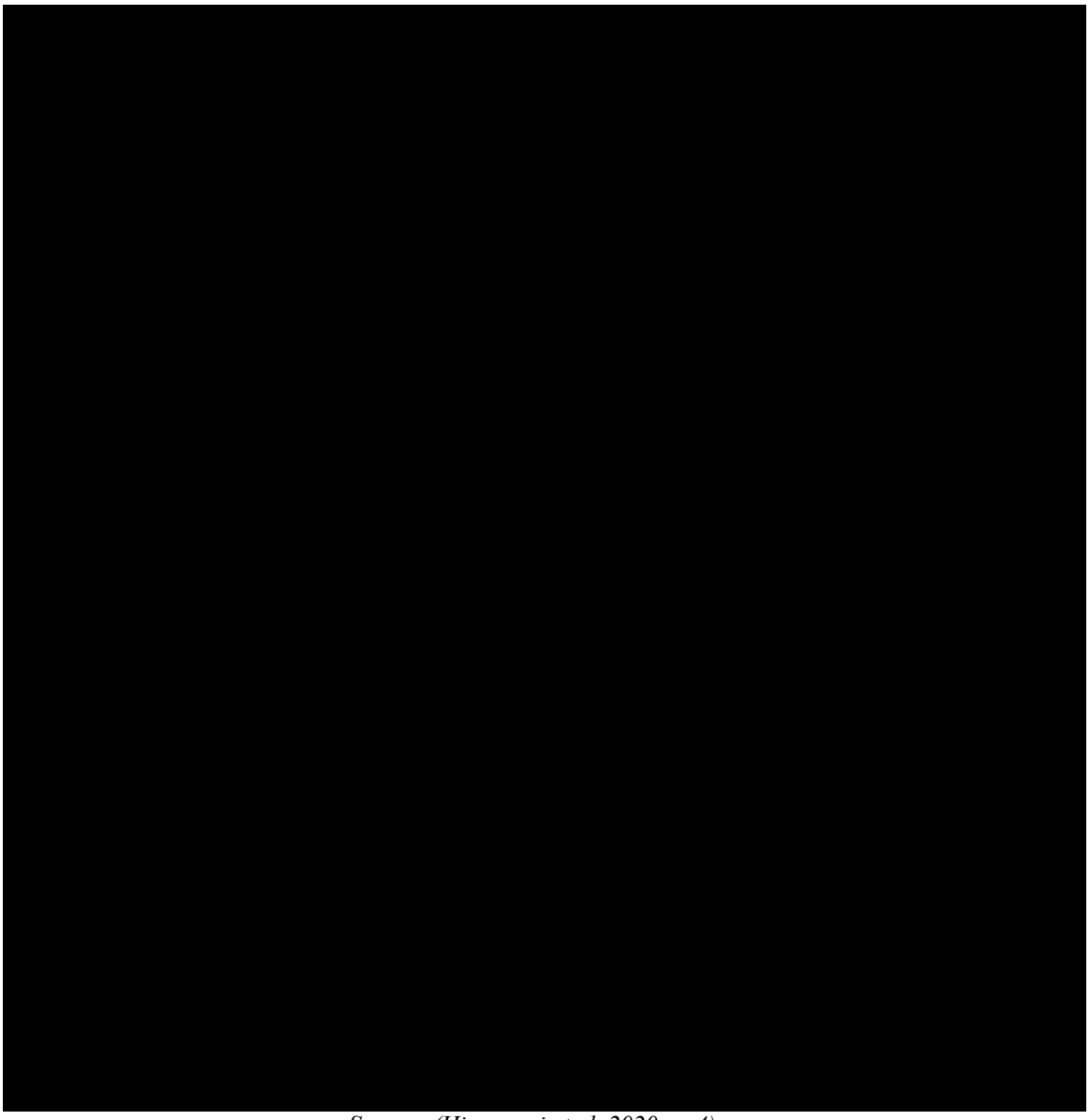
This problem has also been found to be pervasive in India, where due to the increase of criminal activities and police corruption, some police officers have been reported to frustrate the registration of criminal complaints (Hingorani *et al.* 2020, p. 1). Hingorani *et al.* therefore propose a blockchain-based police complaint mechanism that manages the filing of criminal complaints in a decentralized manner in India, as depicted in ***Illustration 32*** below (Hingorani *et al.* 2020, p. 1). An important value proposition offered by the system is encryption.

[186] IPOA was established through an Act of Parliament published in November 2011 to provide for civilian oversight over the work of the police in Kenya. See more on IPOA here: https://www.ipoa.go ke/ [Accessed 9 August 2022]

[187] See media reporting of the case here: https://www.theguardian.com/global-development/2022/jul/22/police-officers-found-guilty-of-of-three-including-kenyan-human-rights-lawyer-willie-kimani [Accessed 9 August 2022]

[188] See reading of the Judgement by Hon. Justice Jessie Lesiit: https://www.youtube.com/watch?v=dhwICvu0w3Q [Accessed 9 August 2022]

Illustration 32: Depiction of Complainant Side Workflow of the Complaints Management System



Source: (Hingorani et al. 2020, p. 4)

Once a complainant files the complaint using a cross platform mobile application, the complaint is encrypted using a secret key derived from the public components of the police station and a security pin (Hingorani *et al.* 2020, pp. 3-4). The complaint is then added to the public Ethereum blockchain which creates a permanent ledger, and the proofs of the transaction are secured on an Interplanetary File System (IPFS) network (Hingorani *et al.* 2020, p. 3). The Ethereum platform ensures that the record is transparent, while encryption ensures that the confidentiality of the user is maintained (Hingorani *et al.* 2020, p. 3).

Once the complaint is filed the system decrypts the complaint on the police end using a secret key derived from the public components of the complainant and police officer security pin

(Hingorani *et al.* 2020, p. 3). The police officer accesses this record through a web portal and can add other police officers as participants to the network to ensure that only authenticated officers have access to this protected information. (Hingorani *et al.* 2020, p. 4). In the event of inactivity, the complainant can, through this platform, file a complaint to the District Magistrate who receives an email alert of the complaint (Hingorani *et al.* 2020, pp. 5, 6).

A clear benefit of the system is that it reduces the interface of the police officer with the complainant at the initial stage of filing the complaint. This means that the officer cannot at this stage make an assessment on whether or not to register the complaint on the basis of the complainant's status or affiliation, or the nature of the complaint. This power transfers to the complainant who files the complaint directly on a verifiable and immutable ledger. The assigned police officer can therefore be made accountable for actions taken or not taken with respect to each filed and published complaint. The availability of this data therefore goes a long way in ensuring the transparency and accountability of duty bearers.

One can see that such a system would also have a clear application in the operationalization of an juveniles' integrated inter-agency electronic case management system (IECMS), such as the NCAJ's Juvenile Justice Integrated Management System (JJIMS) discussed in Chapter Five. Children in conflict with the law normally "fall through the cracks" of the justice system, due to inadequate representation and witness protection among other vulnerabilities (NCAJ 2019, p. 3). In this regard, the NCAJ Taskforce on Children Matters has found that there are only two dedicated Children Courts in the country, that can provide oversight over child justice matters (NCAJ 2019, p. 3). The Taskforce also found that there is also no system or entity set up to account for, or coordinate on, every child in the justice system (NCAJ 2019, p. 3). A system such as that proposed by Hingorani *et al*., would help in tracking the juvenile or offender's movement throughout the criminal justice system, in monitoring recidivism, and in the identification and management of bottlenecks in their cases. This would be done through a record of timestamped identifiers for each transaction recorded and linked on the blockchain network. While there are valid concerns relating to the "right to be forgotten" in the case of juveniles, the system can anonymize the juveniles (or victims) through encryption, to protect them from the negative effects of labelling or stigmatization, or revictimization (Ghiro *et al.* 2021, p. 16). Section 6.2.6 below examines the role of Integrated-ECMS in institutionalizing the value of participation and enhancing coordination within the justice system.

6.2.6 Enhanced Participation and Coordination in Case Management

The lack of effective coordination mechanisms, and the negative effects of silos, can be mitigated by blockchain's consensus-based model of governance, which has the potential to disrupt top-down governance structures, that concentrate power in certain entities (Wright and De Filippi 2015, p. 1). This is because blockchain through its smart contracts makes it possible for multiple parties, working within a decentralized network to reach agreement, without the need for intermediation, and to record this agreement in a secure and verifiable manner (Atzori 2015, p. 7; Wright and De Filippi 2015, pp. 3, 5). Blockchain could therefore potentially enhance the value of stakeholder participation and coordination in the management of cases.

In the criminal justice context, the use of smart contracts consensus protocol means that various agencies including the less dominant ones could easily serve as a check on the decision-making power of another entity, on a given transaction or criminal justice process and *vice versa.* Enabling such checks and balances would further enhance the relevance of the less dominant agencies in the sector, while protecting their independence as individual institutions and those of the other participating agencies.

Blockchain also potentially contributes to democratization of case management by refocusing the design of integrated and none-integrated case management systems to the court user (especially the justice seeker), and their justice needs. Also, as noted above, while the stated objectives of Kenya's justice system remain the delivery of justice, the discussion in Chapter Five demonstrates that currently, virtually all efforts have been geared towards adapting individual case management systems of the sector to that of the Judiciary, without leading the conversation on how these processes align with the justice needs of the justice seeker.

In this regard, Cordella and Contini critique the design of many case management systems which maintain datasets that do not adequately reflect or to link to: the needs of the court user, the courts' managerial function, or human and financial management systems (Cordella and Contini 2020, pp. 23-24). Exp-Blockchain notes that it is possible to design a blockchain system from a human-centered perspective, by coding smart contracts with the needs of the court user / justice seeker at the heart of the design (Ostrom 2010, pp 10-15, 32-34). In essence, all parts of the justice system including its architecture and performance parameters, would be geared towards meeting the justice needs of the court users from a human-centered design perspective, that is, prioritizing people above organisations.

This contrasts with the current approach which consists of principally fulfilling the various bureaucratic functions, procedural or technical requirements of the more dominant parts of the

system, such as the courts. As will be seen below, one of the key ways this can be done is to establish multi-signature protocols which distribute enforcement powers among multiple players and provide additional checks against abuse of power or delays in the delivery of justice.

6.2.6.1 *Hyperledger Fabric* as a Potential Tool for Enhanced Inter-Agency Coordination

Truong *et al.* propose a new approach to enhancing inter-agency coordination, as well as the transparency and integrity of government data using a blockchain-based open data system composed of an architecture with three parts: (i) the *Hyperledger Fabric* to verify data without the need of an intermediary, (ii) an IPFS data storage solution and (iii) a portal to display information gained from the blockchain and handle user requests (Truong *et al.* 2019, pp. 532-533).

Davidson *et al*., observe that while a centralized architecture is appropriate for small scale operations, as organisations scale, become more complex and evolve, a decentralized architecture proves more robust for coordinating activity (Davidson *et al.* 2016, p. 15). Blockchain through platforms such as *Hyperledger Fabric* could therefore potentially enable more fluid and flexible collective, institutional and scalable social organisation (Wright and De Filippi 2015, p. 3).

In this regard, Truong *et al.* note that *Hyperledger Fabric*[189] provides a flexible way to configure a consensus protocol and customize transactions using chaincode, which can be understood to be a superset of smart contracts (Truong *et al.* 2019, p. 531).[190] While smart contracts define the business or transaction logic, chaincode manages how the multiple smart contracts defined within it are packaged and deployed.[191] A chaincode may therefore have multiple smart contracts governing various aspects such as the type of asset, participants, access control rules etc. (Truong *et al.* 2019, p. 531).

Chaincode incorporates an "Endorsement Policy" which defines which organisations/peers/nodes referred to as "Endorsers" must sign (or reject) a transaction

[189] Hyperledger Fabric is an open source project (with a private network of anonymous participants), which is developed and maintained by Linux Foundation in partnership with IBM Corporation. See more information here: https://www hyperledger.org/use/fabric [Accessed 21 March 2021].
[190] See also: Shubham, C., 2019. Are Smart Contract and Chaincode Same in Hyperledger Fabric? *Gitconnected.* Available at: https://levelup.gitconnected.com/do-smart-contract-and-chaincode-are-same-in-hyperledger-fabric-1b4c3034d593 [Accessed 21 March 2021]
[191] See: https://hyperledger-fabric readthedocs.io/en/release-1.2/chaincode html; https://levelup.gitconnected.com/do-smart-contract-and-chaincode-are-same-in-hyperledger-fabric-1b4c3034d593 [Accessed 21 March 2021]

proposal for it to be valid. (Truong *et al.* 2019, p. 531). ***Illustration 33*** below depicts how these three network participants (Endorsers, Consenters and Committers) validate and add transactions to the Hyperledger Fabric as described above:

Illustration 33: Illustration of the Validation of a Transaction on the Hyperledger Fabric

Source: IBM[192]

The "Orderer" also known as "Consenter" nodes, run the Byzantine Fault Tolerance Problem (PBFT) algorithm[193], order the transactions and add them to the block (Truong *et al.* 2019, p. 531: Ussatova *et al.* 2022, p. 19). [194] "Committers" receive the block of transactions from the Consenter nodes, verify that the Endorsement Policy was followed or that conflicting transactions do not exist before writing the them on the blockchain.[195] This architecture allows

[192] Also reproduced in: https://www.investopedia.com/terms/h/hyperledger-fabric.asp [Accessed 20 August 2022]
[193] PBFT provides consensus regardless of malicious behaviour, and reach consensus on the basis of the majority rule, as the protocol assumes that the malicious nodes cannot be equal or greater than 33% of the network. Clients to the network are required to authenticate their identity and send transactions to the validators.
[194] See: https://vitalflux.com/blockchain-transaction-hyperledger-blockchain-network/; https://www.investopedia.com/terms/h/hyperledger-fabric.asp [Accessed 20 August 2022]
[195] See: https://vitalflux.com/blockchain-transaction-hyperledger-blockchain-network/; https://www.investopedia.com/terms/h/hyperledger-fabric.asp [Accessed 20 August 2022]

the *Hyperledger Fabric* to mimic more closely the real-world transaction environment which typically has multiple players, and allows for a more equitable distribution of power within the eco-system.

Another benefit of the *Hyperledger Fabric* architecture, is its support for plug and play and integration with other components.[196] In this regard Belchoir *et al.* (2019) propose the deployment of a blockchain-based application called *JusticeChain* on the *Hyperledger Fabric*, leveraging on the *Hyperledger Composer* (Belchoir *et al.* 2019 p. 322). The *Composer* simplifies the development and deployment of Hyperledger applications on the *Hyperledger Fabric*.[197]

The proponents of the *JusticeChain* set out for it to store, protect and decentralize Portuguese justice sector application logs on the *Hyperledger Fabric* (Belchoir *et al.* 2019 pp. 318, 319). The system is therefore intended to achieve two main goals; (i) to secure justice sector access logs from tampering and (ii) support stakeholder access and collaboration (Belchoir *et al.* 2019, p. 318). The goal of the system is therefore to protect the "log" (or asset), which has unique identifier that includes*: "timestamp, log creation time stamps, an associated logger and case-specific attributes"* (Belchoir *et al.* 2019, p. 321).

In making their proposal to deploy their system on the *Hyperledger* private blockchain, they rule out deploying it on either the public, *Bitcoin* or *Ethereum* blockchains as they find that sensitive information cannot be easily stored or retrieved on them (Belchoir *et al.* 2019, p. 319). They also rule out other private blockchains such as *Quorum and Multichain,* as they find them to be less stable and likely to have lower transaction throughput than the *Hyperledger Fabric* (Belchoir *et al.* 2019, p. 319).

The application addresses challenges raised by a scenario where, as in Portugal's justice sector, the participants in the network are willing to collaborate but do not fully trust each other (Belchoir *et al.* 2019, p. 320). In this respect, the responsibility of managing and auditing the logs is shared by all the stakeholders to the network and not by a single entity (Belchoir *et al.* 2019, p. 320).

[196] Supra. See also: https://www.ibm.com/topics/hyperledger?mhsrc=ibmsearch_a&mhq=Hyperledger%20Fabric [Accessed 20 August 2022]
[197] Supra. It appears that the Composer no longer continues to be supported by the developers, See here https://www.hyperledger.org/use/composer [Accessed 20 August 2022]

JusticeChain therefore decentralizes storage of the logs and in so doing increases *redundancy*[198] which secures the network, and it also allows the authorized auditors to audit the integrity of the system (Belchoir *et al.* 20 19, pp. 319, 320). *Hyperledger Fabric* ensures that this auditing process is decentralized and transparent to the network, due to the chaincode that inspects the logs (Belchoir *et al.* 2019, p. 319). *JusticeChain* has three main participants in the network: (i) the logger node or oracle that receive entries from the justice sector information management systems and records them on the blockchain; (ii) the auditor node that audits the secured application logs; and (iii) the network administrator that manages the blockchain and its participants (Belchoir *et al.* 2019, pp. 320, 321).

While this potential has not yet been fully realized within the criminal justice sector in Kenya, Exp-Blockchain explains that blockchain can, at its current state of development, be used to enhance efficiency by enabling greater (horizontal) communication between the actors, and by reducing disputes about the records. In due course, along with dismantling of hierarchies, blockchain can also be deployed together with other technologies such as file storage and sharing systems to minimize or eradicate single player dominance and the negative effects of silos. These include duplication of efforts or interventions at cross purposes, and lack of cohesion within the criminal justice sector.

However, *Hyperledger Fabric* has itself faced the criticism, the most prominent being that facing all private blockchains, that is, that they are in fact not truly blockchains as they do not fully adhere to the ethos of transparency and immutability (Frankenfield *et al.* 2022). Efficiency and resiliency criticisms have also been levelled against *Hyperledger* due to network delays – these continue to be resolved by the developers (Frankenfield *et al.* 2022).

6.2.6.2 Enhanced Coordination in the Enforcement of Routine Transactions

Exp-Blockchain recommends that when it comes to enforcement, smart contracts are best deployed in routine transactions or "no-contest" cases where human intervention or discretion would not be essential to the process, such as in the administration of traffic offences. In Kenya traffic offences have perennially imposed a strain on justice sector resources, and solutions such as instant fines have been explored to facilitate their efficient management.[199] In 2020/21

[198] Replication of the blockchain across several nodes reducing the chances of a single point of failure. See explanation here: https://www.mckinsey.com/~/media/McKinsey/Industries/Financial%20Services/Our%20Insights/The%20promise%20of%20blockchain/The-promise-of-blockchain.ashx [Accessed 13 August 2022]

[199] UNODC has supported discussions held through the NCAJ on e-justice solutions developed by various actors, on instant fines.

alone, 50,427 traffic cases were filed in the Magistrates' Court (Judiciary of Kenya 2021[a], p. 275). In 2021/2022 this figure had jumped to 60,423 traffic cases filed at the Magistrates' Court, of which 53,850 were resolved (Judiciary of Kenya 2022, p. 265).

The implementation of blockchain to adjudicate traffic offences has been considered by researchers in Malaysia, in implementing a new traffic regulation based on a demerit point system (Pradana *et al.* 2017, p. 375). Pradana *et al.* propose a *Proof-of-Work* traffic offence blockchain model composed of two main layers – the "application" or the end-user interface layer, and a blockchain layer which incorporates smart contracts which imposes demerit points and fines according to the offences stipulated in the traffic regulation (Pradana *et al.* 2017, pp. 377-378). Once 100 demerit points are accumulated, the system automatically suspends the offender's license (Pradana *et al.* 2017, pp. 377-378).

Implementing such a system would foremost alleviate the case backlog problem in a significant way as the adjudication and enforcement of penalties for lesser traffic offences would be diverted away from the justice system to the blockchain. It would also reduce opportunities for corruption due to the transparency of the logs and the minimized interaction between the offender and police officers, particularly where implemented in a largely automated ecosystem involving speed cameras and AI technology.

The Internet Courts[200] in China have been pioneers in the use of smart contracts as enforcement tools (Lu 2020, p. 117). The Beijing Internet Court was the first to employ the judicial smart contract service (JSCS) and implement it in an internet infringement case where parties had reached a mediation agreement (Lu 2020, p. 117). The parties in this case could opt for the JSCS which would enable a *"one-click case filing"* where one party breached the terms of the agreement (Lu 2020, pp. 117-118). The JSCS computed the terms of this agreement to the smart contract, in tandem with automated info-fetching, so that upon breach the aggrieved party could simply institute a *one-click* filing for enforcement (Lu 2020, p. 118). Once cleared by the court filing department, the case is transferred to the enforcement system (Lu 2020, p. 118).

However, it should be noted that while this process greatly reduces the man hours that the filing party would spend in proving such breach, this time consuming burden is transferred to the smart contract coders, a process which is itself error-prone (Lu 2020, p. 118; Vo *et al.* 2018, p. 447). Also, some human intervention cannot be avoided as the court registry would need to undertake the required reviews prior to enforcement (Lu 2020, p. 118).

[200] Hangzhou Internet Court founded in August 2017, Beijing Internet Court and Guangzhou Internet Court founded in August and September 2018. (See Chaisse and Kirkwood 2022)

Nevertheless, the same approach could be adopted with respect to the management of offenders who pose a flight risk, or in the administration of bail or bond. Rather than coordinate (in-person) with the immigration bureaucracy, an offender's passport or other travel documents can be automatically or remotely cancelled upon authentication by the concerned justice sector and immigration authorities. This system should be developed to be implemented from a human-centered perspective, that ensures the rights of both victims or accused persons are not violated. As seen above, one of the key ways this can be done is to establish multi-signature protocols which distribute enforcement powers among multiple players and provide additional checks against abuse of power or delays in justice.

In this regard, an enforcing authority could potentially put in place a smart contract which can execute e-payments (e.g., fines or bail), immediately upon sentencing or violation of bail or other condition, from the offenders' source of funds. The criminal justice system can borrow from decentralized market places where the parties can set up a virtual escrow account implemented by a smart contract or *multisig* account (De Filippi and Wright 2018, p. 76).

In the justice context, this application of smart contracts has been referred to as "escrow-based dispute resolution" (Chaisse and Kirkwood 2022, p. 71). In this case, the smart contract would only release the funds where two of the three parties holding keys to the wallet (including the accused person) "agree" on the basis of certain conditions e.g., the final or terminal decision of an appellate court in favour of such payment (Chaisse and Kirkwood 2022, p. 71). Exp-Blockchain explains this means that for there to be an unauthorized release of funds, two out of the three key holders would have to conspire to do so – an event which would also be recorded on the blockchain. It is however important to note that this system could only apply in a future where central bank issued digital currencies such as the proposed *e-krona* in Sweden,[201] are prevalent and compatible with the blockchain eco-system. The logs from these routine transactions can then be stored permanently on the blockchain to aid future analysis and decision-making on the effectiveness of these individual and coordinated justice sector interventions.

Apart from the Internet Courts, the Chinese government is set to launch smart courts which are an "advanced system of case management" (Chaisse and Kirwood 2022, p. 70). The core component of the smart courts are: (i) a shared website for all courts in China to conduct all operations online, (ii) a judicial transparency platform (iii) and the deep integration of

[201] See more on *e-krona* here; https://www.riksbank.se/en-gb/payments--cash/e-krona/ [Accessed 26 August 2022]

technology (including blockchain, AI, and the Internet of Things),[202] into the courts (Chaisse and Kirwood 2022, p. 73).

The section that follows examines some of the infrastructural benefits, and efficiencies that blockchain can bring to the automation of case management in the justice sector.

6.2.7 Enhanced Security and Data Integrity in Electronic Case Management

In Chapter Five, SenJud-ICT [redacted] identified lack of a robust online security architecture as a key impediment to the digitalization within the justice sector, including the implementation of inter-agency or integrated case management systems. SenJud-ICT noted that once the framework for the implementation of the technology for the country and justice sector is put in place, blockchain could potentially securely enable the following: (i) tying case file information to the respective parties particularly in confidential matters, (ii) recording court transactions (iii) executing rulings and judgements. SenJud-ICT also noted that such a decentralized model would be ideal as the key identity management tool across the entire justice sector and would facilitate the integration of the sector.

As discussed in previous sections, blockchain's decentralized model eliminates the threat of a single point of failure, therefore enhancing security in financial and other transactions. The implementation of blockchain in IECMS would therefore not just enhance the security and integrity of these systems, it would also have the overall effect of building public trust in the management of their data and cases.

While it is clear from the foregoing discussion that the technology has not yet fully evolved to enable the storage of actual data on-chain, the fact that it records the underlying transaction in a sequential, and immutable ledger brings an added layer of security, certainty and transparency to transactions that previously did not exist. Blockchain technology potentially provides better protection against hacking incidents such as those witnessed recently with Equifax.[203]

In this regard and as discussed in the foregoing sections, Estonia serves as a reference point as it has employed KSI blockchain to secure its systems and all public sector data, including the e-justice system (Cheng *et al.* 2017, p. 3).[204] KSI reduces large amounts of data to hash values stored on a private blockchain which allows for the identification of records but not the

[202] See also press coverage here: Li Jiabao People's Daily 3 April 2022 [Accessed 23 August 2022]
[203] See news story here: https://www.theverge.com/2017/9/22/16345580/equifax-data-breach-credit-identity-theft-updates [Accessed 6 February 2021]
[204] See also: https://e-estonia.com/solutions/security-and-safety/ksi-blockchain/ [Accessed 6 February 2021]

reconstruction of the information in the specific file (Cheng *et al*. 2017, p. 3). Changes to underlying files results in a new hash value on the chain (Cheng *et al*. 2017, p. 3). This technology therefore facilitates transparency and monitoring of the database to ensure the integrity of the record (Cheng *et al.* 2017, p. 3).

Exp-Egov/Estonia explains that in Estonia, ensuring the integrity of the record was a value of paramount importance, as the nation purely conducts its business online, and has no back-up paper trail to verify the integrity of the records.

The expert further noted that since the implementation of the blockchain-based system, there have been no security breaches of the nation's data. If implemented in Kenya, this blockchain-enabled security feature would also eliminate the internal threat of "missing case-files" as a result of the collusion between corrupt court officials and litigants. It would also reinforce the country's systems against external threats such as targeted hacking attacks.

Exp-Egov/Estonia also highlights a financial benefit often overlooked in efficient systems – that is the avoidance of financial damages as a result of loss of value e.g., land titles. The expert notes that as blockchain technology immediately tracks unwarranted changes or attacks on the system, future payment of damages due loss of records or value can be avoided all-together.

Nevertheless, and as previously noted, it should be reiterated that despite these added security benefits of employing blockchain to case management, some risks remain unresolved. Key among them is the fact that the continued reliance on traditional off-chain solutions, such as storage solutions which are vulnerable to security breaches. These external factors introduce a vector of potential systemic weakness, and an entry point that threatens the integrity of the ecosystem as a whole.

We also saw that the human layers of the blockchain also remain critical to the success of such technological adoption. It was evident in the KSI and Chinese applications, that even such tried and tested systems cannot prevent, or correct data interference flagged by the blockchain, or effectively subvert the inclusion of erroneous data on the blockchain. This latter part of the equation would depend on a technically competent and alert administrative work force.

Finally, it should also be considered that, implementing private blockchains to support government services requires a robust assessment of the resilience of the specific private system proposed to attacks, and the (minimum) security guarantees required to maintain it, as these vary widely (Martinovic et al. 2017, p. 15). In this vein, Section 6.3 reflects on some of the risks and challenges that can be anticipated in the implementation of blockchain in IECMS.

6.3 Political Risks and Challenges to the Adoption of Blockchain in IECMS

Various technical risks and challenges to the adoption of both public and private blockchains in case management have been identified and discussed at some length, alongside the consideration of their net benefits. This section seeks to examine some of the more politically foundational risks and challenges that can and have in the past, presented a real challenge for technologists and policy makers overseeing technological reforms. These are the classes of challenges that would require exhaustive consideration and debate, at the initial stages of developing a regulatory framework for adopting blockchain in the public sector as a whole, and more specifically in the justice sector as an effective e-justice solution.

An immediate concern for the adoption of blockchain would therefore be harnessing and sustaining the necessary political goodwill to see the project through to completion, in the absence of constitutional moments, or other transformative events such as the COVID-19 pandemic. In this regard, lessons can be borrowed from the sabotage of the Open Governance Partnership initiative (discussed in Chapter Two), which was also intended to inject greater transparency and accountability in the governance of Kenya's public and justice sector. Exp-Blockchain also sees lack of political will as the leading challenge in the adoption of the technology. The expert states that this is largely because many actors *"will not want the level of transparency it can bring."* Sen[redacted] NCAJ [redacted] echoes these sentiments in stating that, this level of transparency and accountability may be challenged by the sector, particularly where the information concerned is subject to public controversy.

Nevertheless, not all political resistance can be said to be unwarranted. In this regard, Lluis de la Rosa *et al.,* note that the main challenge of open innovation and blockchain technology platforms, in particular public blockchains has been the governance question (Lluis de la Rosa *et al.* 2017*,* p. 6). This challenge refers to the question as to who makes the decision when there is a stalemate, or who is to be held responsible when things go wrong within a decentralized and digitalized governance framework, with no real leader (Lluis de la Rosa *et al.* 2017*,* p. 6). This question has arisen in resolving the (still current) scaling issue which impacts the speed of the *Bitcoin* network in particular, and results in high transaction fees (De Filippi and Wright 2018, pp. 56-57). Addressing these systemic failures is further complicated where doing so would the impugn a core tenet of the blockchain, that is its immutability.

The largest public blockchains to date, that is, the *Bitcoin* and *Ethereum* networks have had to face these governance related issues, and are used here to illustrate the governance challenges experienced by blockchains in general. In 2017, the *Bitcoin* network faced a major hurdle in

deciding the measures to take in scaling the blockchain which had been slowed down and thus made inefficient by inadequate block sizes (to fit-in more transactions), and the resulting high transaction fees (De Filippi and Wright 2018, pp. 56-57). One way to resolve the issue would be to create more room within the blocks by removing the signatures or witness information from the block, a solution referred to as *Segregated Witness or SegWit* (De Filippi and Wright 2018, pp. 56-57).[205] This proposal was made by the core group of *Bitcoin* developers, who were strenuously opposed by another group of *Bitcoin* supporters and importantly "miners" responsible for running the nodes that comprise the network (Karanja 2018, p. 12). This latter group felt that this amounted to a risky measure that did not preserve the integrity of Nakamoto's invention as presented in the project's whitepaper (Karanja 2018, p. 12). Instead, this group proposed increasing the block sizes to resolve the inefficiencies experienced on the network (Karanja 2018, p. 12).[206]

As the *Bitcoin* blockchain does not have a singular or centralized leader, this event was the first serious challenge to the decentralized mode of governance presented by the public blockchain. Eventually a compromise was reached involving the implementation of both proposed solutions on the original *Bitcoin* network i.e. *SegWit* and doubling the block sizes from one to two megabytes (*SegWit2x*), without harm to the integrity of the network (Karanja 2018, pp. 12-13).[207] However, miners and supporters opposed to the novel *SegWit* solution eventually split from the network to continue with a chain that they felt adhered to the core tenets of Nakamoto's whitepaper (Karanja 2018, pp. 12-13).[208] This new network also incorporated its own currency or reward system known as Bitcoin Cash (Karanja 2018, pp. 12-13).[209] This split did not harm the original chain largely because that chain, which had until that point been in existence for 7 years, was far longer and better supported by a significant number of miners and the community. The outcome might have been very different for a shorter chain on a less established network exposed to nefarious actors capable of executing a 51% replay attack (De Filippi and Wright 2018, pp. 113-114, 119). This experience leads to the conclusion that there are legitimate reasons for concern with respect to the governance question when implementing

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[205] See: *Segwit2x Explained*. 2017. Video. Published by "Boxmining". Youtube. Available from: https://www.youtube.com/watch?v=T4LGVcaDmGY [Accessed on 19 May 2018] ; See also: *Segwit 2x: What You Need to Know About the Bitcoin Fork.* 2017. Video. Published by "Datadash". Youtube. Available from: https://www.youtube.com/watch?v=HJyQo4vYNdY [Accessed on 19 May 2018]; See also: *Bitcoin Q and A: What is Segwit2x?* 2018. Video. Published by Andreas Antonopoulos. Youtube. Available from: https://www.youtube.com/watch?v=4Sy42Y5oqGo [Accessed on 22 May 2021]; See also: https://www.investopedia.com/terms/s/segwit-segregated-witness.asp [Accessed 6 February 2021]

[206] Supra.

[207] Supra.

[208] Supra.

[209] See Bitcoin Cash website: https://bitcoincash.org/ [Accessed 22 May 2021]

such technology, particularly with respect to the public blockchain. This lesson was later reinforced with respect to the governance of the *Ethereum* blockchain, which goes to show that even proof-of-stake public blockchains are also not exempt from immutability questions.

In the *Ethereum* case, the immutability of the network came into question when in 2016 a fault in the code of the blockchain enabled a hacker to facilitate the theft[210] of millions in *"Ether"* of investor funds in the *Ethereum DAO* (Castillo 2016; Karanja 2018, p. 26). Correcting this issue meant that the *Ethereum* network would have to reverse the transaction that enabled the hack – an intervention that would raise serious questions on the perceived immutability of the network (Castillo 2016). The question which arose was that, if the network can for any reason roll back its recorded history – how then can one claim any confidence in the integrity of the blockchain? Strictly speaking, and taking the code written into the smart contract to be the law prevailing on the blockchain (code is law), the hacking incident enabled by a fault on the code was a legitimate transaction which should not have been interfered with, even if it meant loss of the investment funds (Castillo 2016; Karanja 2018, p. 26). A related question which arose was, could the hacker be held responsible for exploiting a faulty DAO smart contract, which could legitimately be exploited within the code? Eighty-nine per cent (89%) of the miners voted in favour of saving the funds – a decision that similarly split the blockchain in two, that is into the *Ethereum* and *Ethereum Classic* chains (Karanja 2018, p. 26).[211]

While splitting the blockchain and community appear to have worked without much consequence to the *Ethereum* and *Bitcoin* networks – this cannot be a viable option for State implemented systems. Society at large, is simply not ready or adapted for this level of unbridled or unconstrained granular governance. The use of technology is therefore not devoid of transaction costs or frictions that give rise to their own set of peculiar problems. This is a fact that must be taken into account by policy makers and implementers.

Lessig, Atzori and Antonopoulos, therefore advocate for the State and law, as the ultimate arbiters of comparable tensions which may arise on the public sector blockchain. While Atzori acknowledges the benefits to be gained from bottom-up governance models, she nevertheless argues that this latter approach runs the risk of creating a "stateless global society" resulting in the disempowerment of citizens, and the simultaneous empowerment of private entities (Atzori 2015, pp. 4-5, 24). Instead she advocates for a critical approach to the application of the technology, premised on the State as a necessary point of coordination in society, rather than

[210] Note that the funds never actually left the DAO.
[211] See websites here: https://ethereumclassic.org; https://ethereum.org/en/ [Accessed 9 February 2021]

as an immovable or unchangeable institution, and with citizen participation as a non-negotiable component of such governance (Atzori 2015, p.5). This thinking is in line with the position of Andreas Antonopoulos, an early supporter of blockchain technology, who commented:

> *"This is not some kind of crazy 'we don't need governments' manifesto. It's simply that we can make better governments when we don't concentrate power as much in the hands of a few people…"* and; *"The end point is not lawlessness and anarchy, but that legal frameworks become more granular and personalized to the situation."* (Atzori 2015, p. 9; Karanja 2018, p. 27)

Both Atzori and Antonopoulos are supported in their thinking by Lawrence Lessig, who argues that State will not, and in fact should not go away quietly in the governance of cyberspace (Lessig 2015; Karanja 2018, p. 24). According to Lessig, the governance of cyberspace, in which the blockchain resides, should adopt a constitutionalist approach (Karanja 2018, p. 24; Lessig 2006, p. 4). This approach requires that the four modalities or levers of power that regulate the actions of man who he refers to as the "pathetic dot" in this space, that is, the law, code, market forces and social norms, intersect to protect fundamental values and the public good (Karanja 2018, p. 24; Lessig 2006, p. 4, De Filippi and Wright 2018, pp. 173-177). These views are in direct opposition to those of technological purists such as John Barlow, who pronounced the "Declaration of the Independence for Cyberspace" as follows:

> *Governments of the industrial world, you weary giants of flesh and steel, I come from Cyberspace, the new home of Mind. On behalf of the future, I ask you of the past to leave us alone. You are not welcome among us. You have no sovereignty where we gather."* (Lessig 2006, p. 3; Karanja 2018, p. 22)

The concept of "digital constitutionalism" is therefore one that is gaining momentum in response to the alterations caused by digital technology in the constitutional ecosystem, and in particular the protection of fundamental rights and values such as privacy, and the balancing of power (Celeste 2018). According to Celeste these alterations occur due to the fact that digital technology both amplifies and threatens the exercise of fundamental rights and freedoms, as well as destabilizes the balance of power in the constitutional eco-system (Celeste 2018, pp. 4-5). Digital technology does this principally by giving rise to new dominant actors such as private corporations operating in the digital environment (Celeste 2018, pp. 4-5).

Casonato similarly makes the latter observation with respect to Artificial Intelligence in particular (Casonato 2021). The author notes that the limited number of companies that have the technical and financial ability to manage AI has resulted in the emergence of a new form

of “Leviathan” power that easily evades the traditional constitutional forms of control and limitation (Casonato 2021, p.131). The author concludes that this in turn necessitates a new normative or constitutional response to the challenges presented in the digital sphere (Casonato 2021, p. 131). In this regard, Casonato notes that when it comes to justice, some jurisdictions such as France have already banned the use of predictive AI in predicting; the potential outcome of a trial or its success rate, or the likelihood that certain subjects (particularly along the lines of race) may be investigated, convicted, or are likely to reoffend (Casonato 2021, pp. 134, 135). It is clear that these predictive functions could have iniquitous impacts on both the justice system and its clients – particularly offenders. A key concern would be the risk of erroneously labeling offenders on the basis of external and arbitrary parameters as potential repeat or career offenders (Casonato 2021, p. 135). Conversely certain courts may be labeled as non-performing or mal-performing, without a nuanced assessment of all the germane and decisive factors.

It is for these among other reasons that this thesis also advocates for the adoption of a constitutionalist approach to the adoption of blockchain and other emerging technologies in Kenya’s criminal justice sector. While it does not promote the erasure of the Kenyan government and its various organs, this thesis reimagines their reduced and potentially improved role aided by blockchain and premised on a firm foundation of the national or constitutional values in its design and application. In this context, decision-making and oversight over decision-making would be a technology assisted venture, shared both by duty bearers and rights holders.

Potential conflicts should also be anticipated in enabling legislation and policy which would dictate the online or offline steps that could be taken to resolve governance related tensions emerging from both the digital and offline spheres. Code, law and the State would necessarily have to “coexist and collaborate” in this space. The precise mechanics of how this system would work in practice, beyond the potential CMS use-cases explored here, is one that goes beyond the scope of this thesis, but is nevertheless one that warrants further inquiry.

The discussion in this Chapter also highlights the importance of choosing or creating a platform with the most suitable consensus mechanism to solve a specific problem in a given situation. In this respect, a valid concern is that the blockchain space is one that is not only nascent but also fast evolving (Cheng *et al.* 2017, p. 7). This means that government actors may face challenges in identifying not only the most appropriate blockchain solutions, but also the right

service providers with the stability and expertise to see the projects through to completion (Cheng *et al.* 2017, p. 7).

Atzori echoes these concerns in stating that decentralized blockchains effectively expose citizen data and rights to the control of private entities (Atzori 2015, p. 16). As she further points out, one can reasonably foresee a situation where, if these services are outsourced globally, it would give rise to a *"...dominant techno-elite with growing supervisory powers over strategic services at a global level, without the necessary formal legitimacy"* (Atzori 2015, pp. 18, 27). Exp-Blockchain adds that these private entities could exploit or abuse the system by giving themselves unwarranted / back-door access to data they have no right being privy to. The expert therefore recommends that if such partnership is necessary, governments should take measures to independently audit the integrity of the code.

Jalakas similarly notes that the socio-anarchist view of replacing CEOs (or government figureheads) with coders would only result in the transfer of power to the coders who infuse their own values and norms into the code (Jalakas 2018, p. 34). A critical question that policy makers must ask themselves is, whose values are in reality represented (latently or patently) in the code of the system being piloted? Prescribing organisational values in the law alone, does not guarantee that these are the values, or the only values, that will be replicated in the system. As noted by Exp-Blockchain, this highlights the importance of investing in the human capacity and levels of competence that can ensure that the code is effectively and robustly audited to prevent unwanted back-door "value" intrusions. In this regard, Exp-Egov/Estonia notes that while the blockchain timestamping services in Estonia are provided by an independent third party (Guardtime) through a Public Private Partnership (PPP), the integrity of the system is ensured through audits.

These extensive considerations may however have the unintended effect of overwhelming and therefore creating additional government resistance to the technology (De Filippi and Wright 2018, p. 57). It may also result in over-regulation that prevents the adoption or implementation of the technology in the public sector in any meaningful way (De Filippi and Wright 2018, p. 57). To minimize exposure to such external control, this thesis therefore reiterates the importance of a constitutionalist approach to the adoption of technology, that recognizes the primacy of the State, and respect for the nation's sovereignty over its national matters as provided for in its Constitution. The goal is to ensure that new and ungovernable "centers of power" are not created around private entities and the technologies that they develop. Both offline and online steps need to be taken therefore to prevent unnecessary and unauthorized

reach of the government or private entities, into the lives of citizens through blockchain and other technologies, such as through unauthorized mass surveillance.

As previously noted, the government and its individual entities should also harness the requisite internal technical expertise to manage and secure its data. As this technology operates in a digital environment, the cyber security threat remains alive, and it would be incumbent on the government to remain ahead of the curve in ensuring that the platform is not at a future date subject to compromise (Cheng *et al.* 2017, p. 7; De Filippi and Wright 2018, pp 115-116).

This may not always be possible for governments which have not developed sufficient homegrown capacity to manage such emerging risks. For this reason, it may be ill-advised for policy makers and technologists, particularly from less technologically advanced nations, to simply adopt the technology on the basis of its apparent success in other jurisdictions, without first harnessing their own capacity to fully anticipate or manage emergent risks.

Killmeyer *et al.* also warn that blockchain may not be the ideal intervention for all situations, such as where transactions are not complicated, and involve a few actors with high trust levels amongst themselves (Killmeyer *et al.* 2017, p. 11). In the criminal justice context therefore, this may mean that offline processes, or even centralized systems should be maintained, when they are the more convenient and effective measures for ensuring the integrity of the system. ***Diagram 34*** below represents the assessment that ought to be made in deciding whether a blockchain-based or a traditional centralized database system is preferable in a specific context:

Diagram 34: Depiction of Assessment to Determine the Suitability of Blockchain Solutions

Source: (Ghiro et al. 2021, p. 12)

Related to the foregoing point, implementing nations should also first take steps to develop the infrastructure that would sustain such a digitalized eco-system. Beyond the need for technical capacity would be the requirement for internet connectivity, as well as the policy and legislative framework to support such adoption. Court processes and procedures would also have to be rationalized within the digital context, and measures taken to ensure that the due process and human rights protections instituted in the previous paper-based, manual or in-person processes are maintained in the digitalized context.

Another related risk is that blockchain-based ECMS systems could potentially entrench social injustices, if not designed with the circumstances and limitations of the intended user in mind. Exp-Blockchain notes that blockchain-based applications currently demand a degree of technological sophistication from their users, such as the capacity to interpret the filed logs. In previous discussions we have seen how this factor could impact on access to justice for less technologically aware litigants. This has been a factor that has been repeatedly raised by public defenders and the Law Society of Kenya, in resisting the progressive automation of Kenya's justice sector (UNODC 2022). Exp-Blockchain therefore recommends that in the public sector context, blockchain-based applications should be designed with the literacy level of the users in mind. The expert elaborates that not doing so would serve to entrench injustice, as such technologies would only serve the needs of the technically literate, or those with the ability to hire technologically competent representatives. The widespread use of mobile phone applications by even less sophisticated users in Kenya, goes to show that this objective is achievable. Laws and policies governing the use of technology within the criminal justice domain should also be clearly rationalized using accessible language, and should stipulate the limits on the application of the technology within the sector.

Finally, it should be noted that the provenance, accuracy and therefore trustworthiness of the information on the blockchain is only as good as that "fed" into the system, as encapsulated in the adage *"garbage in, garbage out"* (De Filippi and Wright 2018, pp. 114-115). De Filippi and Wright note that where incorrect or misleading data is incorporated into the system, blockchain may even exacerbate the problem by making the said data widespread and difficult to rectify (De Filippi and Wright 2018, pp. 114-115). For these reasons, there should also be reliable offline mechanisms to ensure that data integrated into the system is correct to begin with, so as to circumvent or at a minimum correct, the resulting injustices.

6.4 Conclusion

This chapter has undertaken an exploratory review of the opportunities and challenges that the implementation of blockchain-based case management solutions present to the administration of justice in Kenya. We saw that such implementation links to the goal of establishing an OAO justice sector, characterized by institutions that are not only efficient, but are also more transparent, accountable, democratic and socially just, as laid out in Chapters Two and Three.

It emerged in the foregoing discussion that blockchain is a viable and appropriate solution to Kenya's problems of corruption, opacity, inefficiency and ineffective coordination in the management of criminal cases. It was, for instance seen that the publication of transaction logs on an immutable and decentralized ledger would resolve the perennial issue of missing data. Also, more advanced smart contract applications on private blockchains like the *Hyperledger Fabric* could potentially facilitate greater coordination within the sector. This would ultimately lead to a more cohesive, power-balanced and accountable sector, which places the justice needs of the court user at the core of its operations. It also proposed that smart contracts could automate and therefore minimize human intervention in corruption prone administrative processes such as the adjudication of traffic offences. Blockchain could also have a potential role in the administration of bail and bond and in the securing of e-payments.

These benefits must nevertheless be considered alongside the limitations and risks presented by the technology both in Kenya and in the wider global context, especially when considering pertinent concerns related to governance. Such consideration of risks and challenges is important as these would not only underpin the successful implementation of the technology from a technical standpoint, but would also have implications on harnessing the necessary political support for the proposed technological reforms.

The chapter therefore highlighted the important role of the State as the constitutionally mandated arbiter – a role that cannot be usurped by technology or the private entities entrusted with the role of creating technological solutions. It also emerged that the State needs to have the requisite amount of expertise to not only govern this technological space by ensuring the correct policy environment, base infrastructure and the integrity of offline mechanisms, but also in anticipating and addressing all the dangers and threats posed by such adoption. It was further highlighted that if technology is not implemented with the end-user in mind, it could serve to entrench the exclusion of the less literate and technologically savvy. These among the other factors stated here, must remain on the agenda of e-justice policy deliberations, as we consider all possible, and more so technologically paved pathways to OAO transformation.

7.0 CONCLUSION

The core aim of this thesis is to explore the extent to which blockchain's transformative properties can be leveraged as an "enabler of justice", and ultimately as a harbinger of wider societal change in Kenya (Judiciary of Kenya 2012, p. 19). While this examination is made in the narrow application of justice sector electronic case management systems, the conclusions made are extrapolated to the transformative (and risk), potential of the technology to the justice context and society as a whole. The transformation proposed here is the accelerated reconfiguration of a Limited Access Order (LAO) justice sector to one that embraces Open Access Order (OAO) ideals. In essence, it is hoped that by employing blockchain, Kenya's justice sector can address or mitigate some of the bottlenecks that have resulted in failures of integrity, and the inefficiencies that have plagued it over the decades. These have resulted in the negative outcomes court users experience, which include: corruption, case backlogs, delays, overcrowded prisons and a skewed justice system that sometimes "forgets" to place the justice needs of the court user at the center of its operations. This thesis demonstrates that the adoption of blockchain technology within a constitutional framework that is founded on the values of transparency, accountability, democracy and social justice, has the potential to accelerate the transformation envisioned, that is, one that is both *instrumental* and *systemic*.

O'Neill defines *instrumental* transformation in the context of government, as that which radically changes administrative, information management and service delivery of government, and which may also have an impact on organisational structures and / or management practices (O'Neill 2009, p. 753). She then defines *systemic* transformation as radical change which impacts governance arrangements of public management, including constitutional responsibilities, the regulatory framework and decision-making rights over public resources (O'Neill 2009, p. 753).

7.1 Blockchain and the State

This thesis however stops short of fully embracing the Davidson *et al.* proposition that Distributed Ledger Technologies (DLTs), which include blockchain technology, are a:

> *"...new institutional technology of governance that compete which other economic institutions of capitalism, namely firms, markets, networks, and even governments"* (Davidson *et al.* 2016, p.1).

Instead, the recurring theme of this thesis, first established in Chapter Two, developed in Chapter Three and affirmed in Chapter Six is that this transformational undertaking must be established on a constitutional foundation: one that commences by holding in place the State as the ultimate arbiter, and that interrogates the constitutional values that ought to be advanced and operationalized by technological adoption. The thesis therefore does not advocate for, or even deem it useful or necessary to erase the State and its structures of governance. Rather it reimagines the role of the State, aided by the benefits and checks that blockchain can bring as a mechanism for governance, to facilitate the aforementioned instrumental and systemic transformation.

A value-oriented approach to the adoption of technology would be in stark contrast to the solution led approach, where technology is simply adopted to "patch" or solve a prevalent problem, without further querying the constitutional values and protections to be preserved, or institutionalized in the given context.

Chapters Two and Six therefore explored a governance framework founded on the constitutional values and implemented through technology (government 2.0), but which places the State as the core driver, and center of this process. The chapters warned against an overly exuberant approach to technological adoption, particularly one that negates the crucial role of the State within this new and reworked paradigm of technology-enabled governance. They do so by recognizing that politics and governance entail an ethical human dimension that rises above the reduced function of algorithms and code (Atzori 2015, pp. 22-23). This human dimension is crucial as it allows for discretion in taking into account the circumstances of each specific context, a function which often cannot be relegated to machines and code alone (Atzori 2015, pp. 22-23). As Atzori cautions, it is necessary to keep this in mind, and avoid a "schizophrenic" outcome which results in legal, operational and moral absurdities as those noted in the *Ethereum DAO* case outlined in Chapter Six (Atzori 2015, pp. 22-23).

The decentralized, governance-by-computation paradigm proposed in Chapter Two was analysed through the lens of New Institutional Economics (NIE). It emerged that in the neo-classical context and early NIE thinking, technology was simply viewed as a factor contributing to overall productivity. However, in latter NIE thinking, and with the advent of advanced communication technology, a larger more significant role for technology began to emerge – one that went beyond higher productivity, into the role of governance. This is in keeping with the sentiment that a gain in organisational efficiency is the most important productivity gain (Davidson *et al.* 2016, pp. 14-15).

It became apparent that technology could serve as a useful tool for the coordination of collective action – or governance, a role that till then had been the sole preserve of LAO institutions, and in particular hierarchies. It is observed in Chapters Two and Three that traditional institutional governance mechanisms are exclusionary or closed in nature, which in turn creates barriers for those who interact with them, such as those seeking justice. The challenge for policy makers therefore is to find a path towards a more open or accessible institutional framework.

7.2 Revisiting the Research Questions and Findings

The case for "opening" the Kenyan justice system was laid out in Chapter Five which presented findings from research undertaken via a mixed methods approach laid out in Chapter Four. Chapter Four also set out the research questions which in essence sought to determine to what extent the four broad national values,[212] as well as participatory mechanisms and other technologies were integrated into the justice sector in Kenya.

Chapter Five therefore set out to answer four of the five research questions set out in Chapter Four.[213] The first question sought to find out '***to what extent Kenya's criminal justice institutions had assimilated OAO values'***. In summary, the data analysis in Chapter Five revealed that while much progress had been made in incorporating these values into institutional practice since the promulgation of the 2010 Constitution on the whole, and to varying degrees among the different agencies, more remained to be done. It was noted that inadequate assimilation of the constitutional values, and in particular the values of transparency and accountability posed real threats to the delivery of justice and the integrity of the justice sector in Kenya. In general terms, the National Council (NCAJ), NGOs, and Ethics Commission (EACC) which are largely oversight bodies were observed to fair better with respect to the values, while the Police (NPS), Prosecution (ODPP), Children's Department (DCS), and Probation (PACS) were clearly observed to struggle in this respect.

The discussion also found that the inadequacy of mechanisms for coordination of decision or policy-making and implementation, such as interagency case or records management systems,

[212] Transparency, Accountability, Democracy and Social Justice.
[213] RQ1. To what extent have Kenyan criminal justice institutions embraced Open Access Order (OAO) values?; RQ2. To what extent does the Kenyan criminal justice approach allow for participation in policy-making and implementation?; RQ3. What are the mechanisms used to facilitate "a participatory approach" in policy/decision-making and implementation within the justice sector?; RQ4. What is the role of technology in facilitating the administration of justice?; RQ5. What is the potential role of blockchain technology in facilitating the administration of justice?

negatively impacted efficiency in the justice system. Other structural impediments to efficient operations such as inadequate internet connectivity or transport, were seen to be even more impactful in hampering the delivery of justice in Kenya. It was concluded that these base infrastructure provisions predicated the success of second layer interventions such as IECMS.

With respect to the research questions on the *'**adoption of a "participatory approach" to policy-making and implementation, and on the use of technology to facilitate such participation'***, the analysis of the survey data determined that stakeholder holder participation was more valued over staff or public participation. Public participation was however deemed to be critical to informing which interventions work best and where the gaps remain.

The analysis also found that inefficient "analog" methods were still widely used to facilitate or co-ordinate stakeholder participation in decision and policy-making and implementation in the sector. It was nevertheless observed that the events surrounding the COVID-19 situation, had had a catalyzing impact in propelling the sector into the 21st Century from a technological perspective. In this regard, it was observed that long stalled or even unplanned technology projects were suddenly adopted to help the sector adapt to, and navigate the "new normal".

With respect to the research question on ***'the role of technology in facilitating the administration of justice'***, Chapter Five's discussion on the post-COVID period proved once again to be illustrative. It was found that technology played a key role in enhancing coordination, efficiency and transparency through the use of online meeting platforms, and automated case management systems. The lesson drawn from these post-COVID-19 experiences is that much can be made from the momentum of such seminal events or other "constitutional moments", to scale-up or progress technological or other advancement.

Chapter Five further revealed that the COVID-19 situation had the unexpected benefit of highlighting the crucial role of the National Council (NCAJ) in coordinating the sector, including in times of crisis. It therefore emerged that the NCAJ would be equally important to the uptake and integration of interagency information and case management systems, or any other crosscutting technology by the criminal justice sector.

Having established this foundational understanding, the thesis explored blockchain, hailed as the foremost technological innovation for e-governance, and in the justice context – e-justice. As such, blockchain was interrogated as a viable option for not only facilitating but also accelerating the transformation of Kenya's justice sector towards the OAO ideal. This exploration entailed understanding how blockchain can help in re-engineering and streamlining the sector's businesses processes, specifically in the management of trial related procedures,

as well as in coordinating the sector in this regard, through its application in electronic-CMS and IECMS.

7.3 Blockchain and the Open Access Order

Chapter Six of this thesis therefore sought to answer the final research question on, ***'the potential role of blockchain in the administration of justice in Kenya'***. The Chapter explored some of the use-cases that blockchain can present in mitigating the challenges identified in Chapter Five of the thesis, and beyond. Blockchain is therefore conceptualized as a mechanism for achieving accelerated change, in bringing about not just an efficient, but also an open and collaborative criminal justice system that would be a feature of any Open Access Society as described in Chapter Three.

It emerges that blockchain can enable a justice seeker or court user greater access to the criminal justice system, and enhance the overall efficiency and integrity of the system. In this regard, blockchain can be instrumental in enhancing transparency and accountability, while enhancing the security of the criminal justice system, and the privacy of its users. It was seen that blockchain enables this through its decentralized governance mechanism such as multi-signature (*multisig*) protocols that govern smart contracts which are instrumental in preventing abuse of power by the State in the enforcement of decisions principally by allowing multiple parties to authenticate transactions.

Blockchain's public-private key infrastructure [214] also enhances transparency, and accountability through notarization, while ensuring that privacy is maintained through encryption (De Filippi and Wright 2018, pp. 14-15). It was seen that these protections were especially important in the initial stage of filing a criminal complaint, when a complainant is most vulnerable, and in cases involving minors as accused persons. This is in contrast to other technological adoption in the collection and processing of personal data by law enforcement and other government agencies, which has in previous studies been found to result in *"an undesirable diminution of the citizens' private sphere"* (Danziger and Andersen 2002, p. 614).

Greater transparency and accountability also inform decision-making related to the efficiency of the sector from the micro level (performance management of individuals), to the macro level or the performance of the sector as a whole. It was also seen that blockchain, through its

[214] With public-private key encryption, transacting parties agree to a shared public key that can be published as a reference point, and generates a private key that works as a secret password that encrypts and decrypts messages. (See De Filippi and Wright 2018, pp. 14-15).

immutability, security and *multisig* features, when deployed with other technologies such as data exchange and storage solutions, could be instrumental in the success of an automated or electronic interagency case management system, by enhancing interagency coordination between different agencies in the criminal justice system e.g. through the *Hyperledger* platform. This would in turn have the added advantage of enhancing visibility of often ignored and overlooked players within the system, while refocusing the system on the justice needs of the court user. This is viewed to be important as the lack of visibility experienced by agencies such as Probation (PACS), Witness Protection (WPA) and the Children Services (DCS), has had direct implications on their clients who are also overlooked, and are already disadvantaged and vulnerable persons in society.

With respect to the prevention of corruption, it was also noted that the standardization of fees and other routine processes requiring little or no exercise of discretion such as the adjudication of traffic offences on the blockchain, would to a large extent mitigate a significant corruption vector, and reduce case backlogs. Blockchain was also (cautiously) seen to be potentially transformative in the management of personnel.

Nevertheless, the implementation of blockchain-based CMS or IECMS was not found to be completely unproblematic from a technical or political stand-point. Technically, the novelty and complexity of the technology was flagged as a potential impediment to the smooth execution of this project. Both public and private blockchains were found to have their inherent problems. On one hand public blockchains were seen to be largely inefficient and expensive, while private blockchains prominently raised immutability and therefore data integrity concerns. It was then seen that the integration of these platforms with non-blockchain or other legacy solutions would inevitably add to the complexity of these ecosystems, and hence negatively impact on their security guarantees. Additionally, it became evident that human intervention cannot be avoided – even with the most advanced systems. This necessarily means that offchain mechanisms must be equally aligned to the rigour and accuracy of blockchain-based systems, or else risk perpetuating injustices on the blockchain.

As a result of these and other concerns, Chapter Six demonstrated that political resistance was a likely outcome that reformers must prepared for. To begin with, the transparency question is one that the proponents of these systems must grapple with – what ought to be done when the authorities in place cannot stand the "sunshine" that this technology can bring? At the same time reformers must also be ready to reassure the powers that be, that they would not be

relegating all their power to code and machines, and that in fact the shared responsibility would be mutually beneficial for all concerned.

A more challenging and legitimate problem likely to concern the political class would be resources required to get the system going, even in more mature LAOs. A lot of preparatory work would need to be done to ensure that a competent work force is in place to manage and run a technically challenging environment. Additional infrastructural, legislative and policy provisions would also need to be made to ensure the success of these reforms. Any discussion on technological reforms would therefore need to be predicated on formidable amount of political goodwill, preparation, and resources that a nation state has to be willing and capable of committing to the cause.

However, the conclusion made from these findings is that blockchain does hold great potential for the transformation of the Kenyan justice sector, as it has for Estonia and other jurisdictions, when implemented carefully, and with deliberate consideration of all the risks that it presents.

7.4 Research Going Forward

It is however equally apparent that given the novel and untested nature of the technology, and the various concerns raised above, further research on the merits and risks of the technology in the administration of justice, both in Kenya and beyond, is warranted.

This research into the merits of the blockchain technology was limited by first, the fact that there has not been much analysis or mass adoption of the technology overall, and especially in the context of criminal justice systems. The research was further limited by the fact that even in the private sector, many of the blockchain projects which claim to solve modern day problems such as interoperability of systems, are still in their infancy. It therefore remains to be seen whether these projects can deliver on their promises and do so at scale.

Nevertheless, a report by Deloitte Consulting LLP shows that as of 2017, at least 24 countries[215] including Kenya were either planning to, or had already began piloting blockchain solutions in various spheres within the public sector such as: voting, payments, identity management, health care, corporate registration, taxation, supply chain traceability, entitlements registration and land registration (Killmeyer, J. *et. al.* 2017, pp. 3,15). However, the success of these

[215] These countries were reported to include: United States of America, Canada, United Kingdom, Finland, Switzerland, Ukraine, Georgia, Estonia, Russia, India, China, South Korea, Singapore, Australia, Brazil, United Arab Emirates, South Africa, Uganda, Nigeria, Ghana, Tunisia, Senegal and Tanzania.

endeavours, largely hinges on the management of the delicate balance of the relationship between the State, and technology enabled governance. In conclusion therefore, attaining a clear understanding of the intricacies of these radically different but complementary (technology and non-technology based) governance mechanisms, should be a key focus of research going forward.

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ANNEX I : SURVEY QUESTIONS – NATIONAL CRIMINAL JUSTICE ACTORS

No	Question and Rating / Multiple Choice Options
1.	Select your gender: • Male / Female
2.	Select as appropriate the criminal justice agency that you work for or are affiliated to: • Judiciary/ ODPP/ NPS/ KPS/ PACS/ DCS/NGO or Independent body/NCAJ Secretariat/EACC/WPA/LSK
3.	How long have you worked in your current justice agency? • Less than 1 year/1-5 years /6-10 years/11-15 years/16-20years/More than 20 years
4.	Select the most accurate description of your current professional title: • Judicial officer/Prison officer/Prosecution counsel/Police officer or investigator/Probation officer/Children officer/Legal officer or defence counsel/Programme or project officer/Administrator or administrative assistant/IT or communication officer/Oversight or Anti-corruption officer/Witness or victim protection officer
5.	In your current position, how would you describe the level of your seniority? • Senior-upper management/Midlevel-middle management/Junior-entry level staff
6.	For how long have you held your current position? • Less than 1 year/1-5 years /6-10 years/11-15 years/16-20years/More than 20 years
7.	What if anything, would you improve about your current employment? • Better terms of service/Increased operational resources/Improved work culture/Improved leadership culture/Improved infrastructure/Enhanced capacity building/Improved communication/Other
8.	If you indicated "other" as a priority in the previous question, briefly explain what you would improve in your current employment:
9.	Rate the degree to which the following national values describe your current work culture: • Democracy and participation of the people/Human dignity, human rights, social justice/Transparency/Integrity and Accountability
10.	Rate by degree of priority the national values and principles of governance that you would wish your current agency to embrace or embrace more: • Democracy and participation of the people/Human dignity, human rights, social justice/Transparency/Integrity and Accountability
11.	How does your agency make policies / decisions which impact on staff? • Decision-making processes are not clear to me/Decision-Making processes are consultative of all staff/Decision-Making is confined to senior management/Decision-Making processes are consultative of some senior and junior staff
12.	Indicate the level of your concern on the following as key threats to integrity at your institution: • Lack of, or insufficient transparency in decision-making/Lack of, or insufficient accountability of superiors/Lack of, or ineffective internal oversight mechanisms/Lack of, or ineffective external oversight

	mechanisms e.g. ombudsman/Lack of, or ineffective anti-corruption mechanisms/Other
13.	If you indicated concern for an "other" threat in the previous question – briefly list the key threat to integrity at your agency not listed:
14.	Indicate your level of concern on the following as key threat(s) to the effective delivery of justice by your agency: • Ineffective operational mechanisms (working processes)/Ineffective leadership e.g. in communication of objectives etc./Inadequate facilitation e.g. transport, computers etc./Inadequate interagency collaboration/Lack of, or insufficient transparency and accountability/Other
15.	If you were concerned about an "other" threat – briefly list the key threat to the delivery of justice at your agency not listed:
16.	State if you are involved in policy-making impacting on your institution or agency: • Never/Rarely/Sometimes/Often/Always
17.	How are your views sought prior to decision-making impacting on your institution or agency: • My views are collected through surveys or questionnaires/My views are obtained during staff meetings/My opinions are sought in writing e.g. via email or memo/My supervisor has an individual meeting with me/My supervisor usually calls me on the phone/I can share my views on internal (shared) online platforms e.g. office slack or telegraph platforms/I can share my views through external online platforms e.g. twitter or facebook, complaints mechanisms/Through professional bodies and association platforms
18.	Rate the effectiveness of each of the following mechanisms in obtaining your participation in decision-making: • Surveys or questionnaires/Regular staff briefing meetings/Email/Discussion with supervisors/Internal online feedback and oversight platforms/External oversight platforms e.g. governmental complaints mechanisms/Through professional bodies and associations platforms/Social media
19.	In your opinion, does your participation in decision or policy-making positively impact on, or enhance the delivery of justice? • Yes/No/I do not know
20.	Rate the statements below to indicate how your participation in decision or policy-making, would enhance the delivery of justice: • N/A-My participation would not enhance the delivery of justice/N/A-I do not know if my participation would enhance the delivery of justice/My participation would allow for the consideration of operational aspects that management may not be aware of when making policy/My participation would be crucial to the implementation of decisions/policies due to my current position/My participation would allow for consideration of innovative solutions to operational problems when making policy e.g. ICT solutions/My participation would be crucial for the consideration of legal or other impediments to the implementation of

	decisions or policies/My participation would enhance transparency and accountability/Other
21.	If you indicated "other" in the previous question, briefly explain how your participation in decision-making would enhance the delivery of justice:
22.	Rate the statements below to indicate why your participation in decision or policy-making would not enhance the delivery of justice: • N/A – My input would enhance the delivery of justice/My input would not be helpful to the decision or policy-making procedures due to the nature of my work/My input would be adequately represented by my seniors or others participating in the process/There would be resistance to my input or ideas due to my current junior position/Other
23.	If you selected "other" in the previous question, briefly explain how your participation in decision-making would not enhance the delivery of justice:
24.	Does your agency engage other criminal justice actors in policy-making? • Never/Rarely/Sometimes/Often/Always
25.	Rate the statements below to indicate how your agency engages criminal justice actors in policy-making: • N/A-Stakeholder participation is not sought by my agency/Through Case Committee meetings/Through Court Users' Committee (CUC) meetings/ Through NCAJ Taskforces/Through stakeholder meetings/Through shared online platforms (e.g. Case Management Platforms, twitter/facebook)/Through bilateral engagements with the concerned agency/Through public fora (e.g. workshops, public barazas or open days)
26.	Rate each of the following mechanisms to indicate their degree of effectiveness in enabling stakeholder collaboration in policy-making: • Case Committee meetings/ CUC meetings/Through NCAJ Taskforces/Stakeholder meetings or round tables/Public online platforms (e.g. twitter/facebook)/Online justice sector fora (e.g. multi-agency case management platforms)/ Bilateral engagements/Public fora (e.g. public barazas or open days)
27.	Rate each of the following mechanisms to indicate their degree of effectiveness in enabling stakeholder collaboration in policy implementation: • Case Committee meetings/ CUC meetings/Through NCAJ Taskforces/Stakeholder meetings or round tables/Public online platforms (e.g. twitter/facebook)/Online justice sector fora (e.g. multi-agency case management platforms)/Bilateral engagements/Public fora (e.g. public barazas or open days)
28.	Does criminal justice stakeholder participation in policy-making facilitate or enhance your work in the delivery of justice? • Yes/No/I do not know
29.	Rate the statements below to indicate why criminal justice stakeholder engagement in policy-making enhances the delivery of justice: • N/A – Stakeholder participation in policy-making does not enhance the delivery of justice/N/A – I do not know if stakeholder collaboration enhances the delivery of justice/It enhances stakeholder "buy-in" of department initiatives by other criminal justice actors – and therefore prevents resistance to the initiatives/It enhances coordination and ensures that there are no gaps in service delivery (e.g. in the

	management of offenders)/It hastens the delivery of justice as gaps are identified and addressed effectively/It increases transparency by criminal justice actors/It enhances accountability by all criminal justice actors/It saves costs in the delivery of justice by reducing redundancy resulting from duplication of activities by the different criminal justice agencies
30.	If no, briefly explain why criminal justice stakeholder engagement in policy-making does not enhance the delivery of justice:
31.	Is public participation sought by your agency in policy-making? • Never/Rarely/Sometimes/Often/Always
32.	If the public are engaged in policy-making, rate the statements below to indicate how such engagement is facilitated: • N/A-Public engagement is not sought by my agency in policy-making/Through complaints or information boxes situated in our offices/Through public online platforms (e.g. twitter, facebook)/Through our agency's online feedback platforms/Through a complaints' or public relations officer (e.g. ombudsman)/Through written or electronic public surveys/Through public meetings or fora (e.g. open days, town halls or baraza meetings)/Other
33.	If you indicated an "other" method in the previous question, briefly state how your agency seeks public participation in policy-making:
34.	Rate each of the following mechanisms to indicate the degree of effectiveness in facilitating public participation in policy-making: • Complaints or information boxes situated in our offices/Public online platforms (e.g. twitter, facebook)/The agency's online feedback platforms/Complaints or public relations office (e.g. Ombudsman)/Written or electronic public surveys/Public meetings or fora (e.g. open days, town halls or baraza meetings)
35.	Does public participation in policy-making enhance or facilitate your work in the delivery of justice? • Yes/No/I don't know
36.	Rate the statements below to indicate why public participation in policy-making enhances your work in the delivery of justice: • N/A – Public participation does not enhance my work/N/A-I do not know if public participation enhances my work/It helps us understand the issues on the ground better/It helps us understand our client better/It helps us create "buy-in", or the management is more likely to respond to the public/It ensures accountability/It facilitates oversight/It ensures public cooperation in the implementation of policies/Other
37.	If you selected "other" in the previous question, briefly state how public participation in policy-making enhances your work:
38.	If you selected "No" in Q.35, briefly explain why public participation does not facilitate or enhance your work in the delivery of justice:
39.	Does your agency collaborate with any of the following criminal justice agencies in policy-making? • Judiciary/Prosecution/Prisons/Police/Probation/Children's Department/Witness Protection/Ethics and Anticorruption Commission
40.	In your opinion, how desirable is it for your agency to collaborate with each of the agencies below in policy-making?

	• Judiciary/ Prosecution/Prisons/Police/Probation/Children's Department/Witness Protection/Ethics and Anticorruption Commission
41.	Which of the following processes involve your agency collaborating with other criminal justice agencies? • Arrest and investigation process/Court processes (e.g. court filing, hearings)/Management of witnesses or victims/Management of vulnerable groups e.g. children and persons with disabilities/Administrative processes e.g. verification and processing of documents/Oversight and human rights matters/Other
42.	If you indicated that you collaborate on "other" processes, briefly state which processes you collaborate on with other criminal justice agencies:
43.	How would you describe your agency's bureaucratic structure? • All decisions have to be made through lengthy bureaucratic process involving the highest management levels/I or my superior have some flexibility in making decisions that impact on our department/I or my superior have significant flexibility in making decisions that impact on our department/I or my superior have some flexibility in making decisions that impact on the agency as a whole/I or my superior have significant flexibility in making decisions that impact on the agency as a whole
44.	How does your agency's bureaucratic structure impact on decision-making? • It has no impact at all/It hampers or slows responsiveness in the delivery of justice/It allows for responsiveness to urgent needs in the delivery of justice/It eliminates or greatly reduces errors in implementation of decisions/It results in errors in implementation of decisions/It encourages corruption or lack of transparency in decision-making/It reduces corruption due to multiple oversight mechanisms/Other
45.	If you indicated "other" in the previous question, briefly state how your agency's bureaucratic structure impacts on decision-making:
46.	Briefly state how you would change your agency's bureaucratic structure to enable you do your job better?
47.	Indicate the degree to which you interact with the technology below in your functional role: • Official telephone or cell phone/Private telephone or cell phone/Official email/Official computer/Private computer/Your agency's automated case or records management platform/Online inter-agency case management platform/Automated or online personnel evaluation platform
48.	Indicate the degree to which the technology below is available to you in your functional role: • Official telephone/ Official email/Official computer/Departmental case management platform/Online or automated inter-agency case management platform/ Online or automated records management platform /Automated or online personnel evaluation platform
49.	Do you use all the technology available to you for your functional role: • Never/Rarely/Sometimes/Often/Always
50.	List any technology available to you in your functional role, which you do not use:
51.	Rate the statements below to indicate why you don't "always" use the technology available to you:

	• N/A-I always use all the technology available to me/I find that the technology usually does not work or does not work at all/I find that it does not work effectively or is slow/I find it difficult or cumbersome to use/I find it is expensive to use or maintain either by myself or the agency/I find it is unnecessary or superfluous – other methods do the job better/I do not like using technology
52.	Briefly describe a time when a new technology was introduced to facilitate your work and it failed – provide the reasons it failed:
53.	Briefly describe a time when a new technology was introduced to facilitate your work and it succeeded – provide the reasons it succeeded:
54.	In your opinion, would an inter-agency case or records management system enhance the delivery of justice: • Yes/No/I do not know
55.	Rate the statements below to indicate the degree to which the inter-agency case or records management system would enhance the delivery of justice: • It enhances coordination by all criminal justice actors/It enhances safe custody of records/It hastens the delivery of justice by reducing bureaucratic process/It increases transparency by criminal justice actors/It enhances accountability by all criminal justice actors/It saves costs in the delivery of justice by reducing the need for documentation and travel/It reduces gaps or mistakes in the delivery of justice due to transparency and enhanced coordination/Other
56.	If you indicated "other", briefly state how an inter-agency case/records management system would enhance the delivery of justice:
57.	If you indicated in Q.54 that an inter-agency case or records management system would not enhance the delivery of justice – briefly state why:
58.	Have you heard of blockchain technology? • Yes/No
59.	If you selected "Yes" in Q.58, provide a short description of your understanding of blockchain technology:
60	If you selected "Yes" in Q.58, in your opinion can blockchain technology enhance efficiency and integrity in the delivery of justice? • Yes/No/I do not know/ Not applicable – I selected "No" in Q.58

ANNEX II : SAMPLE INTERVIEW QUESTIONS – NATIONAL (EXTERNAL) EXPERTS

(Exp-DCS/PACS); (Exp-NPS/ODPP/WPA); (Exp-NGO/JUD/NCAJ)

No.	Observation	Agency / Expert to be interviewed
I	**Preliminary Questions**	
1.	Provide brief background on professional role and expertise: a. Organisation affiliation b. Agencies supported c. Years of service	All 3 Experts Covering ; • Prosecution (ODPP) • Police (NPS) • Judiciary • Witness Protection (WPA) • National Council Secretariat (NCAJ) • Probation (PACS) • Children's Department (DCS) • NGOs / Independent bodies
II	**Assimilation of Values**	
2.	The survey data shows that the values of Transparency and Accountability overall appear to lag behind democracy and social justice in criminal justice institutions – do you agree with this finding?	All Experts
3.	If not – why would agency respondents tend to believe so?	All Experts
4.	If yes – provide examples of how this is seen to be the case?	All Experts
5.	Why do NGOs and NCAJ appear to have a higher assimilation of values of democracy, social justice, transparency and accountability than other criminal justice agencies? If false, what creates this perception among the respondents?	NGO and NCAJ Expert
6.	Why do NPS, DCS and ODPP appear to have a lower assimilation of the values of democracy, social justice, transparency and accountability than other criminal justice agencies? If false, what creates this perception among the respondents?	NPS, DCS and ODPP Experts
7.	Why do threats to integrity appear to be a major concern for PACS?	PACS Expert
8.	Why does ODPP despite appearing to have a lower assimilation of the values, have lower levels of concern for the threats to integrity?	ODPP Expert
9.	Would you say that the lack of / insufficient accountability of superiors is of greater concern than lack of accountability in general for PACS/ WPA?	PACS and WPA Experts
10.	Is lack of oversight over NGOs a major problem or concern?	NGO Expert

11.	If so, provide examples of how this may be manifested in the performance of their roles?	NGO Expert
12.	Is adequate facilitation / provision of resources more key to the delivery of justice than the national / institutional values?	All Experts
13.	If so why?	All Experts
14.	If not, why not?	All Experts
III	**Decision and Policy-making and Implementation**	
15.	The (survey) data shows that decision-making in NPS, ODPP and PACS is mostly confined to decisions impacting on one's department – is this true?	NPS, ODPP, PACS Experts
16.	If so, what is the impact of this?	NPS, ODPP, PACS Experts
17.	Are some agencies more core to the administration of justice than others – i.e. without their participation in policy-making and implementation the entire system fails?	All Experts
18.	If so which are the central agencies in the administration of justice and why?	All Experts
19.	The data shows that management of vulnerable groups such as children is central – why does PACS, DCS, WPA not have prominence in the criminal justice system?	PACS, WPA, DCS Experts
20.	What is the unique contribution or role of the public in policy-making / implementation?	NCAJ Expert
IV	**Adoption of Technology**	
21.	What are the key impediments to adoption of technology by criminal justice institutions?	All Experts
22.	How are these being addressed, including by the development partners?	All Experts
23.	Have criminal justice agencies adopted automated agency case or records management systems?	All Experts
24.	What have been the impediments to the adoption, or success of automated agency case or records management systems?	All Experts
25.	How are these being addressed, including by the development partners?	All Experts
26.	What has been the impact of adopting or not adopting automated case or records management system?	All Experts
27.	Have criminal justice agencies adopted automated performance management systems?	All Experts
28.	What have been the impediments to the adoption or success of automated performance management systems?	All Experts
29.	How are these being addressed by the development partners?	All Experts

30.	What has been the impact of adopting or not adopting automated performance management systems?	All Experts
31.	Have automated interagency / records management systems been adopted by criminal justice agencies?	All Experts
32.	If yes, why?	All Experts
33.	If no, why not? What would be the key impediments to the adoption or success of an interagency case or records management system?	All Experts
34.	How are these being addressed by development partners?	All Experts
35.	What would be the key benefits of the adoption of an interagency case or records management system?	All Experts
36.	The data showed that pre-COVID-19, in-person engagements were rated to be the most effective and were the most popular in facilitating stakeholder participation in decision and policy-making. Is the same true post-COVID-19?	All Experts
37.	How has the COVID-19 pandemic changed the manner in which decisions and policies are made?	All Experts
38.	What technologies have been adopted in this regard?	All Experts
39.	What have been the benefits of adopting technology in decision and policy-making?	All Experts
40.	What have been the disadvantages of adopting technology in decision and policy-making	All Experts
41.	How are these challenges being addressed?	All Experts

ANNEX III : SAMPLE INTERVIEW QUESTIONS – [redacted]

(SenJud-ICT)

A. Consultations on Policy Formulation

1. Provide a background to the origins of the integrated court management system?
a. Who conceived/originated this idea?
b. Who is the driver of the idea?
c. What challenges motivated this initiative?
2. What does the integrated system entail?
a. Integration of what (systems)?
b. Integration / interface between whom (institutions)?
c. Software / Hardware infrastructure?
3. What was the **internal** policy-making / consultation process that accompanied this process of integration?
a. What levels of the hierarchy within the judiciary were involved in the judiciary?
b. What job groups were involved within the judiciary?
4. What were the logistical, cultural or ideological challenges in the internal consultation process?
5. What are the positive outcomes of internal consultations?
6. What were the negative outcomes of / lack of **internal** consultations?
7. Were there external consultations?
a. With whom were the external consultations?
8. What were the logistical, cultural or ideological challenges during the **external** consultation process?
9. What were the positive outcomes of **external** consultations?
10. What were the negative outcomes of / lack of **external** consultations?
11. How far has this integration project gone? At what stage is it now?

B. Consideration of National Values in the Consultation Process

12. Has there been a discussion on the role of values (in Art. 10 Constitution) in any of these two processes?
a. What values were highlighted?
b. What values were not highlighted?
c. Was there a "clash of values"?
13. Who have been the greatest champions of this process?
14. Who have been the greatest impediments to the process?
15. What considerations were at the center of the design of the system?
16. Who was consulted during the development of the system?

C. "Technology as an Enabler of Justice"

17. What does this mean to you?
18. How is technology currently used to "enable justice"?
19. How would the integrated system enable justice?
20. Have you found that technology has been an impediment to justice?
a. If so, provide examples
21. What technology is currently used within the judiciary?
22. What technology will be used in the integrated system?
23. How will this technology work?
a. What are the key features?
b. What elements will be integrated to the other agencies?

24. How will this technology ensure values / are values designed in the technology?
a. Accountability
b. Transparency
c. Responsivity
d. Participation of the people / inclusivity
25. What are the key benefits of this technology?
26. What are the key disadvantages of this technology?
27. Do you see a role for blockchain technology in interagency collaboration?
28. What are the considerations being made with respect to data security – would a decentralized system have advantages in ensuring data security?

D. Role NCAJ – Interagency collaboration

29. What do you see as the role of the NCAJ in the enhancing interagency collaboration?
30. What has the NCAJ done well in this regard?
31. What has the NCAJ not done well in this regard?
32. How can the NCAJ harness technology as an enabler of justice?

ANNEX IV : SAMPLE INTERVIEW QUESTIONS [redacted]

(Sen[redacted] NCAJ)

A. Introductory questions

1. Provide a brief overview of your professional role and other relevant involvement in the sector.
a. Have there been challenges, conflicts or tensions associated with the job roles?
b. How have the challenges been resolved or mitigated?
c. What are the advantages of holding both positions?

B. National Council on the Administration of Justice (NCAJ)

2. What do you see as the role of the NCAJ in the enhancing of interagency collaboration?
a. What has the NCAJ done well in this regard?
b. What has the NCAJ not done well in this regard?
3. Why has the NCAJ not addressed the issue of the weak secretariat through "secondment" of staff from the individual agencies?
4. How is the NCAJ structured to enhance interagency collaboration?
5. How are policies / decisions made at the NCAJ?
a. Provide a background of the institutional design of the NCAJ for policy-making?
b. What is the level of engagement of the different agencies in policy-making?
c. Are some agencies more engaged than others?
d. Do some agencies have more leverage than others e.g. more influence in policy direction?
6. What are the challenges in policy / decision-making at the NCAJ?
7. What are the challenges in policy / decision implementation at the NCAJ?
8. What have been the key achievements of policy and decision-making at the NCAJ?

C. "Technology as an Enabler of Justice"

9. What does this phrase mean to you – "Technology as an Enabler of Justice"?
10. How do you think policy-makers conceive of the role of technology in enabling justice?
11. What is the general perception towards technology in the NCAJ[redacted]?
a. Has technology been embraced in the justice sector as a tool for enabling justice?
b. How do these perceptions impact on the design and implementation new processes and systems i.e. have they been an impediment or accelerator?
12. How is technology currently used to "enable justice" in the NCAJ / justice sector?
13. Have you found that technology has been an impediment to justice?
14. How can the NCAJ harness technology as an enabler of justice?
a. What role can technology play in enabling interagency collaboration?
15. Does the NCAJ plan to adopt technology to facilitate interagency collaboration?
a. If so what technology?
b. How about interagency case / records management technology?
16. What would be the challenges to adopting technology at the NCAJ?

D. "Values" that might inform Policy and Decision-making within the Justice Sector

17. What ethos / values (Art. 10 Constitution) inform decision and policy-making within the justice sector / NCAJ?
a. What values were highlighted / emphasized?
b. Were any values de-emphasized? (If so, which ones?)
c. Has there been a "clash of values"? (If so, between whom?)
18. How are these values actualized in the work and structures of the NCAJ [redacted] e.g. in the creation of policy, systems, rules and protocols?

a. In creation of systems and policy is there any discussion on what values the policy or system seeks to promote, or what values inform the policy or system?

19. It's often suggested that technology will enable the justice system to achieve greater accountability, transparency, responsivity and inclusivity. Do you agree with this perception?

a. If so, how can technology enable greater accountability, transparency, responsivity and inclusivity within the justice system?

b. Is this a consideration when designing systems within the justice sector e.g. [redacted] NCAJ?

E. Blockchain Technology

20. Are you familiar with blockchain technology?

21. Do you see a role for blockchain technology in interagency collaboration?

22. How might this technology help attain those values — transparency, accountability, responsivity, inclusivity?

23. What might be the barriers to introducing new systems that use this technology?

a. Are there particular stakeholders and/or agencies that might resist technological uptake?

ANNEX V: SAMPLE INTERVIEW QUESTIONS – E-GOVERNANCE EXPERT/ESTONIA

(Exp-Egov/Estonia)

A. PRELIMINARY QUESTIONS

1. Provide a brief overview of your professional role and other relevant involvement in the criminal justice sector – particularly in the implementation of blockchain technology?

B. VALUES

2. To what extent has technological adoption been founded on constitutional or national values?
a. Prior to adoption was there a discussion on the role of values e.g. of transparency, accountability, social, democracy in technological adoption?
b. Was there a discussion on Value-Sensitive Design?
3. If so how did values impact on technological adoption – especially that of blockchain?
4. If not how have values impacted implementation of technology?

C. PUBLIC SECTOR ADMINISTRATION – X-ROAD KSI AND E-JUSTICE

5. How is blockchain being used in the context of public administration?
a. Provide an overview of the blockchain ecosystem, i.e. KSI blockchain, eFile and X-Road
b. How was blockchain introduced – e.g. sandboxing, piloting, incubation?
c. How was blockchain integrated to existing ICT Systems?
6. How has blockchain been used in policy-making and implementation in the criminal justice context?
a. If it has not been used in policy-making – how do you think it can be applied in this context?
7. What have been the benefits of using blockchain-based solutions – in particular;
a. How have they aided greater transparency, accountability, democracy and social justice
b. Privacy of juveniles and victims
8. What has been the impact of blockchain on the overall efficiency of the justice sector?
9. What has been the impact of blockchain on policy-making and implementation within the justice sector?
10. What has been the impact of blockchain on interagency coordination and case management?
11. What has been the impact of blockchain on justice sector spending and the management of resources and operational costs?
12. Other role of blockchain in enabling "decentralized governance" in the justice sector?

D. CHALLENGES

13. What have been the challenges in the implementation of blockchain?
a. Infrastructural challenges
b. Social Challenges
c. Political Challenges
d. Resources
14. Has blockchain had any perceptible NEGATIVE impact on:
a. Transparency
b. Accountability
c. Democracy /participation
d. Social Justice / human rights / inclusion
15. Has blockchain had any negative impact on the privacy of citizens?
16. Has blockchain enhanced or diminished government control or unnecessary government reach?

ANNEX VI : SAMPLE INTERVIEW QUESTIONS – BLOCKCHAIN EXPERT

(Exp-Blockchain)

A. Introductory questions

1. Provide a brief overview of your professional role and other relevant involvement in the development and implementation of blockchain technology?
a. Relevant ICT experience (education + skills)
b. Experience in blockchain related work
c. Role / projects implemented

B. VALUES

2. In your view what is the relationship between technology and values if any?
a. Do technical artefacts have embedded within them intrinsic values?
b. Do technologists embed their values into technical artefacts in the design process?
c. Or are values relational / instrumental i.e. dependent the relationship with the users?
d. Have you heard of **"Value Sensitive Design"** - what is your view on it?
3. If any of the above is true (i.e. technology intersects with values in any way) what do you think are the values most relevant to blockchain technology – and how so?

C. IMPLEMENTATION OF BLOCKCHAIN IN THE PUBLIC SECTOR

4. How do you think blockchain can enhance values in the public sector?
a. Transparency in decision-making
b. Accountability
c. Participation / democracy
d. Social justice – i.e. inclusion, fairness in allocation of resources
5. How do you think blockchain can enhance efficiency in the public sector, in the following spheres?
a. Financial efficiency
b. Interagency coordination
c. Accountability and standardization of payment systems
d. Transparency while protecting the identity of protected or vulnerable persons
e. Implementation of non-custodial sentences through electronic monitoring
f. Facilitating micropayments
g. Management of personnel and implementation of Self Sovereign Identity (SSI)
h. Dismantling hierarchies in the criminal justice system / single player dominance

D. RISKS AND CHALLENGES

6. In your view what are the main risks and challenges in the implementation of blockchain in the public sector?
a. Infrastructural challenges
b. Social Challenges
c. Political Challenges
d. Economic challenges
7. Has blockchain had any perceptible **negative** impact on:
a. Transparency
b. Accountability
c. Democracy /participation
d. Social Justice / human rights / inclusion
8. Has blockchain had any negative impact on the privacy of citizens?
9. Does blockchain enhance or diminish government control or unnecessary government reach into the lives of private citizens?
10. What in your view are the dangers of public private partnerships (PPPs) in the implementation of blockchain in the public sector?

ANNEX VII: ADDITIONAL TABLES

(i) Table 35: Medians of Improvement of Employment Variable / Proxy for Level of Satisfaction

(1=Not a priority, 2=Low Priority, 3=Somewhat Priority, 4=Neutral, 5=Moderate Priority, 6=High Priority, 7=Essential Priority)

Agency	Computed Variable	Better terms of service	Increased operational resources	Improved work culture	Improved leadership culture	Improved Infrastructure	Enhance capacity building e.g. training	Improved communication	OTHER
DCS / Children	5.00	6.00	7.00	5.00	6.00	6.00	5.00	5.00	1.00
NGO / Independent bodies	4.00	4.00	6.50	4.50	4.50	4.00	4.00	5.50	1.00
EACC / Ethics	6.00	6.00	6.00	6.00	7.00	6.00	6.00	6.00	4.00
Judiciary	6.25	6.00	7.00	6.00	6.00	7.00	5.00	5.50	1.00
KPS / Prisons Service	1.00	6.00	1.00	1.00	1.00	6.00	1.00	1.00	1.00
NCAJ Secretariat	5.50	4.50	7.00	5.00	6.00	6.00	7.00	6.00	2.50
NPS / Police	6.00	6.00	5.00	6.00	6.00	6.00	6.50	6.00	6.00
ODPP / Prosecution	5.50	5.50	7.00	5.50	4.50	5.50	6.50	6.50	5.50
PACS / Probation	7.00	7.00	7.00	5.00	7.00	7.00	6.00	7.00	2.00
WPA / Witness Protection	6.00	6.00	7.00	5.50	4.50	7.00	7.00	7.00	4.00
Total	6.00	6.00	7.00	6.00	6.00	6.00	6.00	6.00	1.00

(ii) Table 36: Medians of Mechanisms used in the Collection Staff Views in Policy-Making

(1=Never, 2=Rarely, 3=Sometimes, 4=Often, 5=Always) **and;**

Medians of Effectives of Mechanisms

(1=Poor, 2=Fair, 3=Good, 4=Very good, 5=Excellent)

	Surveys	Staff meetings	Writing e.g. email / Memo	Meeting / Discussionwith supervisor	Internal online feedback and Oversight platforms	External online platforms e.g. Social media	Professional bodies and associations platforms
Most / Least Used Mechs. for Staff Participation	**3.00***	**3.00***	**3.00***	**3.00***	**2.50**	**1.00***	**2.00**

Effectiveness of Mechanisms	**3.00**	**3.00**	**3.00**	**4.00***	**3.00**	**1.00***	**2.00**

(*Shaded=Extreme statistics)

(iii) Table 37: Medians for Mechanisms used in Criminal Justice Stakeholder Engagement in Policy-Making

(1=Never true, 2=Rarely true, 3=Sometimes but infrequently true, 4=Neutral, 5=Sometimes true, 6=Usually true, 7=Always true) **and;**

Medians of Effectiveness of Mechanisms

(1=Poor, 2=Fair, 3=Good, 4=Very good, 5=Excellent)

	Case Committee Meetings	Court Users' Committee Meetings	NCAJ Taskforce Meetings	Stakeholder Meetings	Online Justice sector platforms e.g. Case Management Platforms	Social Media	Bilateral Engagement With Agency	Public Fora
Most / Least Used Mech for CJ Participation Medians	**6.00***	**6.00***	**6.00***	**6.00***	**4.00***	**4.00***	**5.50**	**5.00**
Effectiveness of CJ Participation Mechanisms medians	**4.00***	**4.00***	**4.00***	**400***	**3.00***	**3.00***	**3.00***	**3.00***

(*=Extreme statistics)

(iv) Table 38: Medians for Effectiveness of the Mechanisms in Policy *Implementation*

(1=Poor, 2=Fair, 3=Good, 4=Very good, 5=Excellent)

	Case Committee Meetings	Court Users' Committee Meetings	NCAJ Taskforce Meetings	Stakeholder Meetings	Online Justice sector platforms e.g. Case Management Platforms	Social Media	Bilateral Engagement With Agency	Public Fora
Effectiveness of CJ Participation Mechanisms medians	**4.00***	**4.00***	**4.00***	**400***	**3.00**	**2.50***	**3.00**	**3.00**

(*=Extreme statistics)

(v) Table 39: Medians of Mechanisms used in Public Engagement

(1=Never true, 2=Rarely true, 3=Sometimes but infrequently true, 4=Neutral, 5=Sometimes true, 6=Usually true, 7=Always true) **and;**

Medians of Effectiveness of Mechanisms

(1=Poor, 2=Fair, 3=Good, 4=Very good, 5=Excellent)

Variables	Complaints or Information boxes in Offices	Public online platforms e.g. Social media	Agency's online feedback platforms	Complaints' or public relations office	Written or electronic public surveys	Public meetings or fora
Most / Least Used Mechanisms for Public Participation Medians	5.00	3.50*	3.50*	4.00	4.00	5.50*
Effectiveness of Mechanisms Medians	3.00	3.00	3.00	3.00	3.00	4.00*

(*=Extreme statistics)