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Criminal justice and the
technological revolution



COVID-19 has prompted a profound shift in the use of technology across justice systems internationally. The challenge today is how to build on and accelerate recent progress.



The journey towards a fully digitally-enabled criminal justice system is underway and the potential benefits are vast. The work yet to do is daunting, but the increased access to justice it could deliver is exciting.

In this article, we set out some ways that digital and virtual justice can support service transformation for victims, witnesses, people with convictions, and criminal justice professionals. We focus on the need to create a new digital ecosystem around current services and to target technology investments on the biggest problems highlighted in our international research effort:

- Harnessing digital twin capabilities to reduce court backlogs
- Making virtual prisons a reality
- Supporting rehabilitation through virtual desistance platforms

The acceleration of digital and virtual justice

COVID-19 has prompted a profound shift in the use of technology across justice systems internationally. In the countries our global initiative focuses on – Australia, Canada, India, Ireland, Netherlands, the UK and the US – and indeed across the world, police, prosecutors, courts, prisons and probation or parole services increased their use of video-conferencing and remote working significantly. In England and Wales and states or provinces of Australia and Canada, preliminary court hearings (dealing with procedural matters before trial) became almost entirely virtual affairs.

The e-committee of the Supreme Court of India has been regularly reporting on new virtual initiatives in high courts across the country, including e-filing, virtual training, and automatic case update systems.¹ Prisoners in most countries were given greater access to video calls to maintain family contact and liaise with lawyers, including occasionally through in-cell tablets. And probation and parole officers shifted from in-person meetings with those released from prison to a mix of phone, video and socially distanced in-person check-ins depending on perceived needs and levels of risk.

The impact of these changes still needs to be evaluated, but this remains a profound shift. And in many cases, COVID-19 responses either accelerated or complemented longer-term initiatives to digitise large parts of the criminal justice system. Our work shows that our focus geographies all have major programmes of technology-enabled change underway to digitise and manage criminal case information through online platforms and to increase use of remote and virtual working technologies. Many involve long-term billion-dollar investments and are among the most significant change programmes operating across governments.

Digital and virtual justice at a crossroads

The challenge today is how to build on and accelerate recent progress. As one justice leader observed, *“The pandemic has provided support, drive for digital transformation...[It’s been an] interesting time to find the places to accelerate digital transformation – putting in some interim solutions, while keeping in mind that there is a wide range of transformation that will require more investment in time and business thinking”*.²

Our interviews with criminal justice leaders suggested that COVID-19 responses had increased enthusiasm about the benefits of technology, as well as optimism about what was possible. As one Canadian police chief put it, *“it comes back to the COVID factor and economic costs. Government is stretched. That has created a platform for digital solutions, [and potentially] exponentially reduced the costs of court and corrections systems – game-changing”*.³

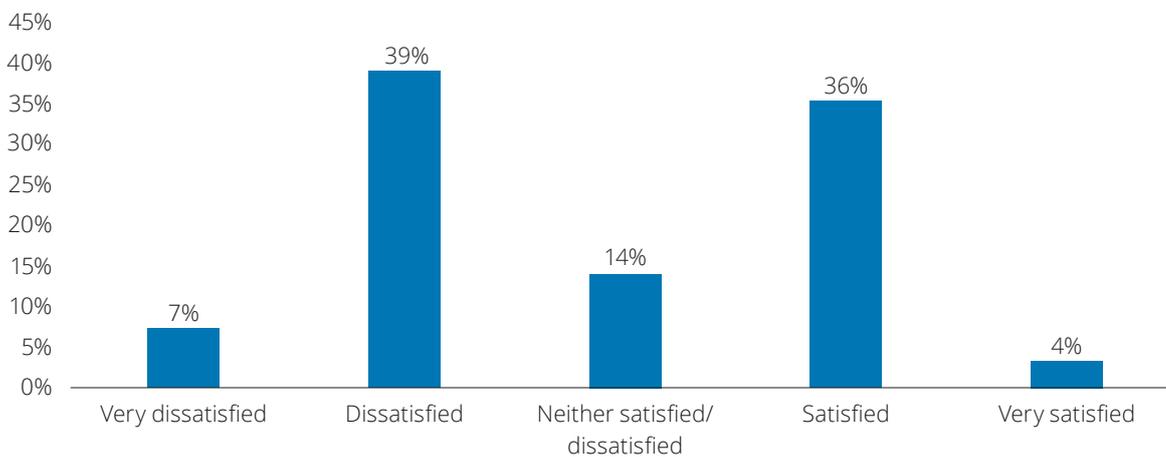


Many governments, for example Ireland and British Columbia, Canada, have justice ministers who have put digital transformation at the heart of their reform agenda. And a degree of optimism at least is reflected in the results of our global justice leader survey. As recently as 2019, the Chief Justice of Ontario, Canada – now leading a range of digital justice reforms – was

noting that some courts had very poor WiFi access or even none at all.⁴ Similar laments were heard across the world. But our survey showed that in the autumn of 2020 nearly as many justice leaders were satisfied with their justice systems' use of technology, as dissatisfied (figure 1).

Figure 1: Satisfaction with technology adoption

Q. How satisfied are you with how the criminal justice system in your geography is performing in adopting technology effectively?



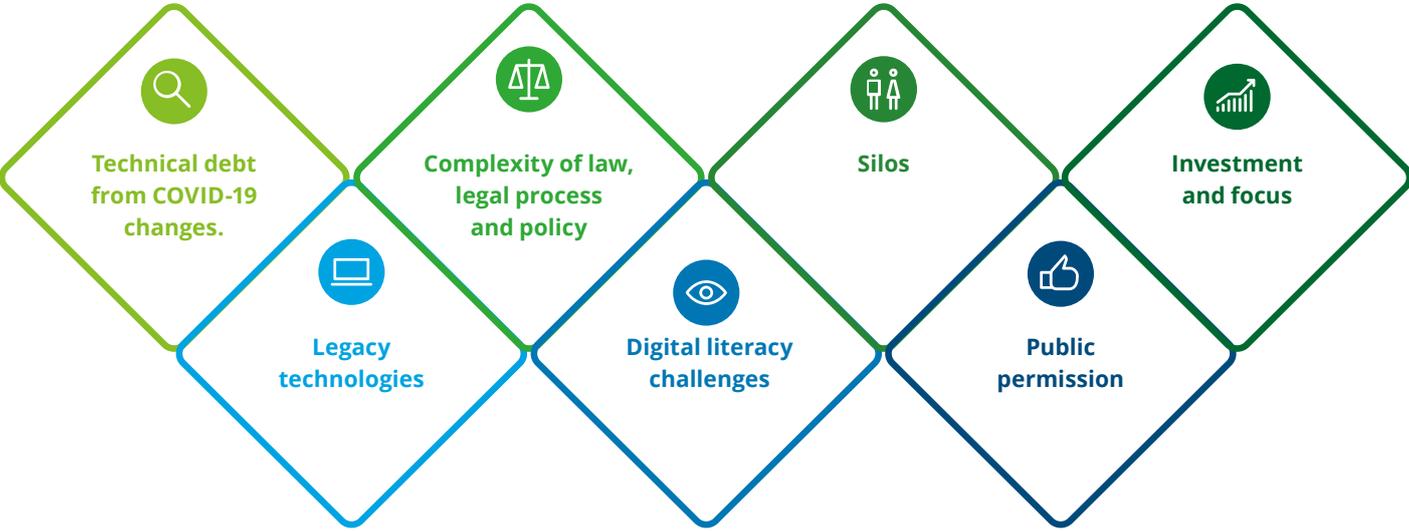
Source: Deloitte survey of justice leaders across our 6 focus geographics Australia (14), Canada (3), India (1), Netherlands (3), India (1), Netherlands (3), UK (7), US (1), Other developed country/cross-jurisdiction (1)

There are still huge challenges, however. Nearly half of justice senior leaders we spoke with and surveyed are dissatisfied with technology use for a reason. In the private sector, digital and digitally supported customer experiences are both widespread and sophisticated, as is the use of robotic process automation. And the emerging use of cognitive AI technologies at an enterprise level is increasing the focus on privacy, transparency and ethics, and corporate security. Those at the frontier of technological innovation are demonstrating to governments and service users **what is possible** – leaving them more frustrated by what governments offer.⁵

The progress developed in response to COVID-19 is also far from sufficient. As one NSW courts official put it, *“There is still a while to go. It’s important to create a full scale end-to-end digital solution”... “we have swapped paper-based manual processes for electronic processes with manual workarounds, however, we need full digital solutions”... “we need to pick up the pace on digital transformation”*.⁶ Many highlighted that the big opportunity is not strictly about technology. True transformation will require a fundamental, end-to-end redesign of justice system processes to deliver better outcomes and better experiences – for victims, witnesses, the accused, and the families and professionals who support them.

Redesigning services in the twenty-first century almost always benefits from attention to enabling technologies. The justice system is about people and behaviour change, which technology can now assist. But it is also fundamentally about information, and technology is fundamental throughout the information lifecycle. To make progress, most justice organisations will need to overcome myriad challenges highlighted in our research, including:

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| <p>Workarounds put in place at speed in response to COVID often requiring additional retrospective work to support security and sustained future development.</p> | <p>Legacy technology and technology workarounds are at most 50 years old, whereas legal complexity has been building for hundreds of years. In many countries, there are multiple differences between law, process and policy between national and state/regional/provincial jurisdictions, which creates additional complexity.</p> | <p>The vast majority of interviewees recognised that there were barriers to the collaboration required to create a seamless experience for users. As one New South Wales official commented, <i>“Despite efforts to deliver a coordinated response to crime there is still a siloed approach: police deal with crime, corrections deal with offenders and courts are responsible for case management and efficiency as opposed to reducing levels of demand”</i>.</p> | <p>COVID-19 has had a major fiscal impact that is likely to translate into public spending constraints in the medium term. These may affect the criminal justice system disproportionately – as justice reform has rarely been identified by political leaders as one of the priorities for national recovery.</p> |
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Historic underinvestment in technology has created a legacy of outdated – and in some cases poorly integrated – systems, full of complexity and bespoke workarounds.

Some – though by no means all – professionals in older generations started their careers in a largely technology-free environment (particularly as courts, prisons and probation services have been relatively late adopters of technology). In addition, large parts of the younger workforce (e.g. corrections officers) have not been digitally enabled partly because their roles have been perceived as not requiring digital tools.

Progress in areas such as digital access and visitation for people with convictions was generated in a time when the public recognised we were facing exceptional circumstances due to COVID. Several interviewees wondered whether political and public support for digital access would continue to be as high a priority as COVID-19 recedes and other approaches become viable again.

In this context, the risk is that leaders see continued innovation, enabled by technology and often working across organisational silos, as 'too difficult', despite its benefits. The pandemic saw people more willing to embrace proportionate risk (for example, recognising that the benefits of mobile phone access or remote contact with families outweighed security risks). But there is still danger of the return of risk aversion, not least because traditional solutions can still be partially effective against many problems. Yet, that effectiveness comes at the cost of forestalling further development: court backlogs can be somewhat alleviated through longer court opening times and increased staff, rather than virtual hearings and deep improvements in the efficiency of information sharing; prisons can reopen their visitor suites for (typically highly constrained) family contact and their classrooms for education, rather than embrace the benefits for wellbeing, behaviour in prison and recidivism generated through additional virtual visits and education opportunities. Community corrections and parole officers can reopen their offices and quickly fill their time with in-person contact, rather than pursuing a hybrid model of supervision and support that our interviewees generally viewed as far more successful.

The risks of approaches that still feel 'new' to many are often all too visible, while the risks of inaction are hidden. When considering whether to maintain the increased use of virtual technologies in prison, for example, there has been anxiety about misuse of devices that prisoners have been given access to – but there is no comparable conversation about taking away visitation rights or cutting down staff numbers, despite the fact that contraband continues to enter some prisons through these routes on a daily basis.

Without clear strategic commitment and leadership, it is therefore far from inevitable that the criminal justice systems' use of technology catches up with other areas of public service and the private sector – rather than falling even further behind.

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Human solutions supported by a digital eco-system

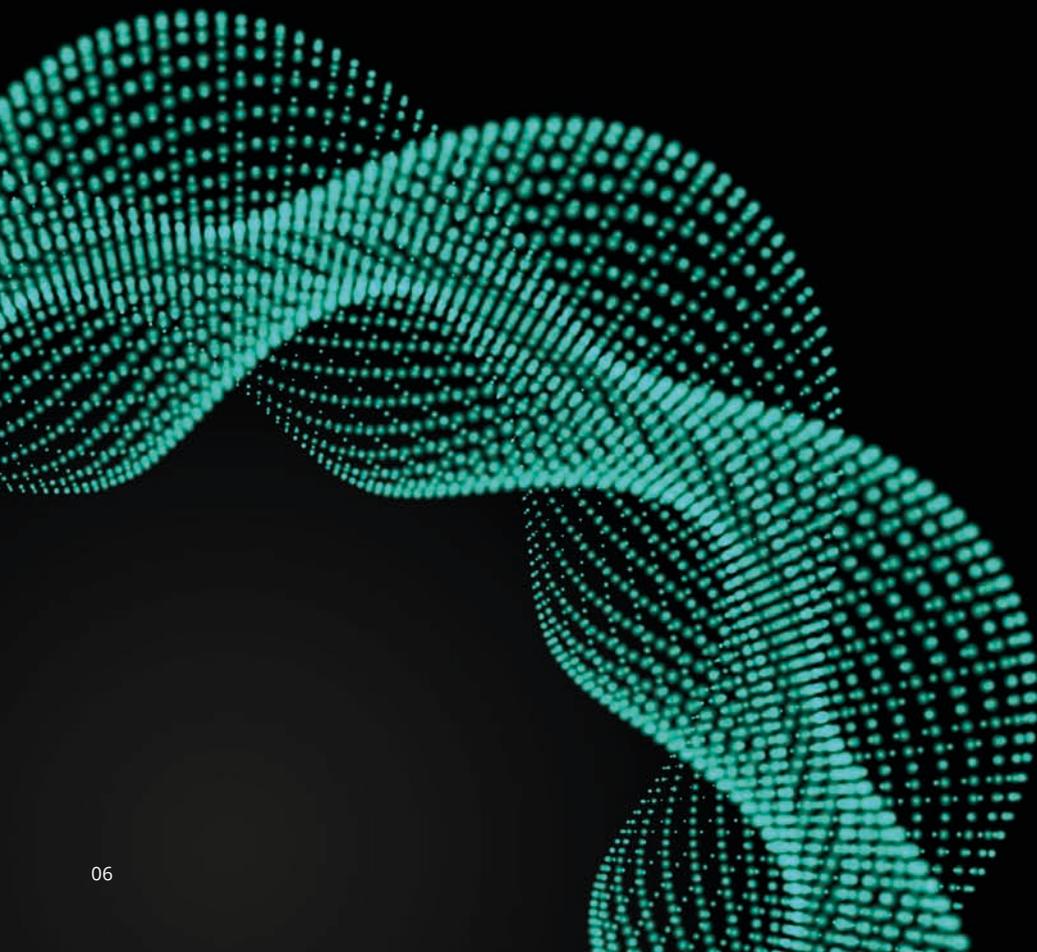
The main lesson from historic technology projects is arguably that it is rarely the technology that determines success.⁷ Technology is simply a tool to support people to work and achieve their goals in different ways. And as New South Wales' Minister for Customer Service Victor Dominello, put it in a speech earlier this year *"digital alone is not enough. Whilst we must have the right technology foundations in place, when we go 'beyond digital' we must look at the hard questions of how government works: delivering services that put the customer first; working across departmental silos to build common platforms; and getting the foundations in place for security, privacy, transparency and ethics."*⁸ There is a value to digitising existing processes, but the true transformation comes through changing what is done in more fundamental ways: redesigning services around what citizens need, empowering people and communities to solve their own problems, using data analytics to help professionals identify the interventions that most help reduce crime and support justice.

Success is also no longer about a single digital 'solution'. This article features the ways that technology can help address specific cross-national justice challenges highlighted by our research: court backlogs, disappointing levels of reoffending, rising costs of the physical infrastructure of prison. But these can only deliver the best results when they are developed as part of a holistic approach to improving justice services with technology.

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The new digital justice ecosystem

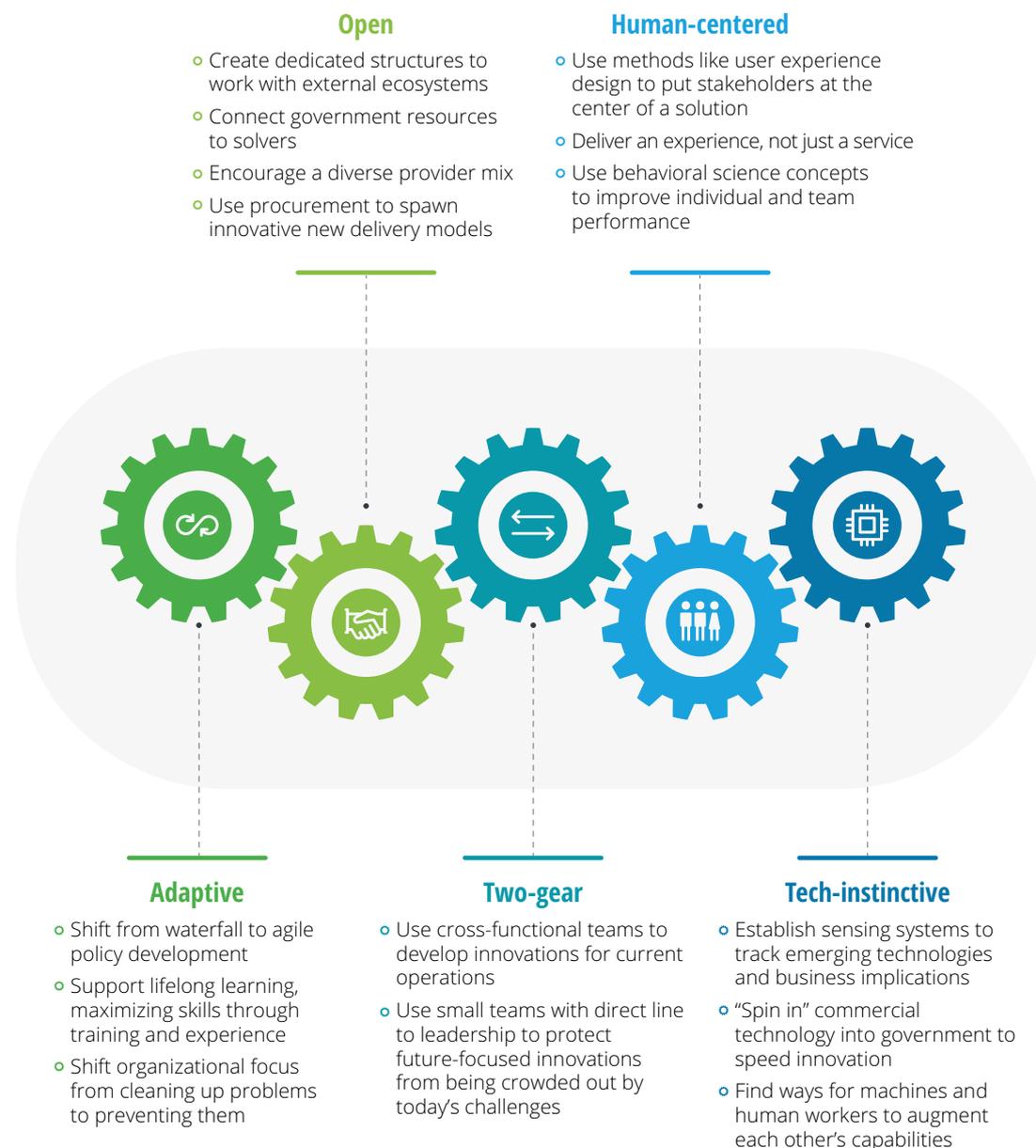


The new digital justice ecosystem

We believe justice systems must now think in terms of nurturing digital eco-systems that are capable of constantly evolving to meet the needs of different service users' and harnessing the dizzying pace of technological innovation. And, as we highlighted in Deloitte's [Creating the government of the future report](#), this requires fundamental shifts in approaches to technology enabled change, embracing five paradigm shifts (Figure 2)⁹.

We need to create rewarding – and in some cases transformative – service user experiences. This means shaping services around citizen and user needs, building open systems that many organisations can contribute to and benefit from, working iteratively in cross-functional and often cross-organisational teams, and designing services that anticipate future developments in the criminal justice environment, rather than reacting slowly.

Figure 2: The five big paradigm shifts for creating the government of the future



A new digital justice ecosystem needs to have three key components: data at the heart of the system; advanced analytics; and human-centred services and platforms.



1. Data at the heart of the system. The criminal justice system is fundamentally about information – be this evidence in criminal cases or information about people involved in these as witnesses, victims, and offenders. Yet today information is fragmented and often inaccurate, partial, or hard to access.¹⁰ Processes and documents are still often paper-based and many information systems are designed in ways that make data upload and extraction challenging, and linking data from different sources cumbersome. When information is so important, its inaccuracy or absence is critical. The current approaches can create many daily burdens and frustrations for professionals across the system – extra work to find a suspect, to spot a repeat victim, to help ensure witnesses and the full facts of a case are present in court.

We see huge potential for improvements if criminal justice agencies take advantage of emerging good practices in data management. Advances in cloud computing and the associated architectures using containers, microservices and the other types of cloud-native technology mean that vast volumes of criminal justice data can already be stored securely on the cloud. Data could then be shared with and accessed by eligible organisations and providers who rely on good information to deliver improved services and outcomes.

Common definitions, data standards and APIs and a co-ordinated approach to data governance could also be developed that would allow a wide range of systems to interface seamlessly with data pools, assuming security and Privacy, Transparency and Ethics (PTE) standards are met. [Deloitte's Tech Trends](#) work has shown that advanced organisations are also now increasingly able to benefit from automation and machine learning to organise and clean 'messy' data.¹¹

Rather than focusing on storing clean data that fits neatly into tables, rows and columns, it is possible to use analytics, semantic models, and cognitive technology to automate manual, costly data stewardship activities.¹² And this could be a large benefit to a justice system with a vast amount of unstructured historical data.

In the near future, data steward capabilities will grow with new tools that aid with ingestion, classification, management, and discovery. Reports could help users to visualise data readiness and quality and enable greater data management efficiency. Systems can also create ways of providing feedback to professionals who input data – either highlighting the way information has been used for good, or ways that data gaps have undermined court hearings, or created risks for the public. Such tools, along with robust data governance, can help ensure that data becomes seen as a core asset for the entire criminal justice system.

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2. Analytics. With data, comes the potential for insight. We highlight below how analytics and machine learning could be used to reduce court backlogs and support reductions in reoffending, but analysis can also support major improvements in efficiency and effectiveness across the criminal justice system. New tools that provide insights are being developed at a dizzying pace with Deloitte's research showing that the machine learning technologies market is currently growing at a rate of 44% annually and is expected to reach US\$8.8 billion in value by 2022.¹³ We highlight above that such tools can improve data accessibility and quality, but they become even more powerful when they are used to:

- understand 'what works' in changing offending behaviour or serving victims and witnesses;
- predict service user preferences and behaviour;
- anticipate and manage fluctuations in demand – for example through better rostering or buildings and estates management; and
- manage complex – and often interconnected – risks.

There has rightly long been a demand for criminal justice policy and expenditure on transformative activity to become more evidence based. Governments spend significant sums to investigate whether a particular programme reduces reoffending, for example. In future, however, we believe analytic tools that draw on data will be able to provide constantly updating real-time assessments of the effectiveness of different interventions and allow tailoring of programme's to an individual's risks and needs. Opening up information to approved researchers can also enable a broader interrogation of system and intervention effectiveness.

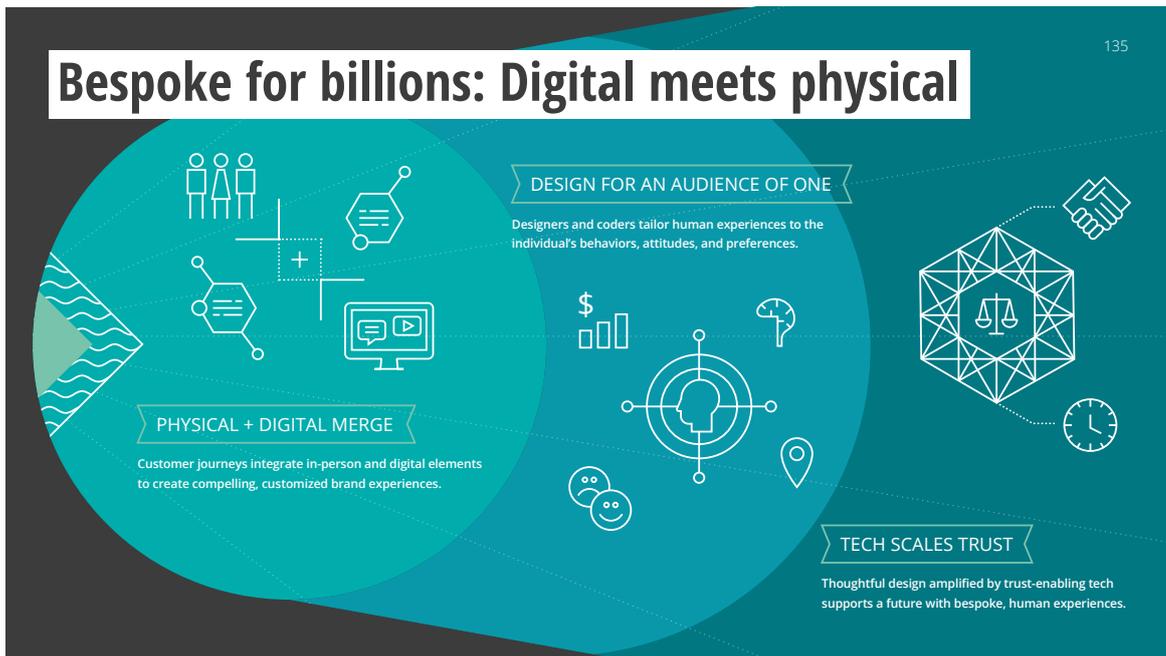
3. Human-centred services and platforms. A major conclusion of the professionals and leaders we interviewed as part of this global future of criminal justice project was that increased use of digital and virtual services during the COVID-19 pandemic offered huge benefits. But it was also clear that there is an additional value from some forms of human contact that cannot be replaced. For example, people on parole enjoyed their new-found ability to do shorter virtual check-ins as they were much less disruptive to their ability to search for or do work, for example. But they also reported that these check-ins worked best when they already established trusting relationships with parole officers and that they found it difficult to build new relationships via phone or video calls. Increasingly, services will need to be designed with recognition of these subtleties and even in light of the different preferences of service users and preferences. Deloitte's [Tech Trends 2021](#) highlights the idea of Bespoke for Billions – which captures the increasing potential to harness analytics and user-centred design to shape services around individual needs and wants, and often blending physical and virtual experiences (Figure 3).

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Building on a robust approach to data and a range of analytic tools, criminal justice systems can better design a wide range of services around the needs of victims, witnesses and offenders – and the professionals who help ensure justice is done for the public. Online platforms will be a vital part of service delivery – for example, platforms that the police and legal professionals can use to build and interrogate digital case files. And the Court Digital transformation strategy in British Columbia, the UK Transforming Courts and Tribunals programme, or the €200 million cross-agency digital fund in the Netherlands all provide valuable lessons on what can work here. As long as common standards are applied and data is widely available, government can harness any one of a number

of different platforms, vying for success in a growing international lawtech arena. Microservices and other types of cloud-native technology can now be developed at pace to meet new needs or add functionality: for example, to support victim liaison throughout a criminal proceeding through user-centre notifications, scheduling facilities and support interfaces. Digital services will need to be ‘owned’ and integrated into exceptional overall service experience by appropriate agencies or cross-agency groups. We explore the approaches required to embed a ‘whole systems’ approach to supporting victims and witnesses in a future article.

Figure 3: Bespoke for Billions – a Deloitte Tech Trend for 2021



Source: Deloitte analysis

These three cornerstones of a future criminal justice technology and service ecosystem are currently being developed at differing paces in organisations across the world. Many global firms have successfully migrated from a monolithic architecture to a microservices architecture that provides exceptional agility and scalability at lower cost and supports their renowned customer focus. Financial institutions are in the midst of a similar transition, with banks opening up to a raft of innovation from FinTech. Services such as Deloitte's own [Alpha Platform](#) are readily incorporated into the architecture of the banks.

Many public sector organisations across the world are embarking on this transition and the prize for success is vast. As one Canadian police chief explains, *"We're now having healthy discussions on fully digitizing the process – from arrest to courts. The data has to go with the arrest warrant through the entire justice system. If we can do this, then the likelihood that we can get right assessment of the individual to provide the right service and keep the public safe [soars]"*.¹⁴ Early work by the Causeway Programme in Northern Ireland provides a useful source of experience and lessons learned to maximise the benefit that can be derived from electronic case files and other elements of a digitised Criminal Justice process.¹⁵ And the European Commission's Digital Criminal Justice initiative has provided insights into modes of cross-border collaboration.

Success will, of course, depend partly on building strong in-house technology capability – along with the specialist technology procurement and market stewardship skills required to stimulate innovation and competition. Market innovation is emerging constantly.

Yet the shift requires more fundamental changes across criminal justice organisations and the wider criminal justice ecosystem. Prioritising seamless user experience requires breaking down both functional and often organisational silos. Policymakers, operational delivery teams and technologists from multiple organisations will usually need to collaborate seamlessly to create better service experience – and to embrace open, agile ways of working that can feel deeply unfamiliar and challenging. And governments will likely need to find much better ways of engaging and developing the emerging market of suppliers, including with updated approaches to public procurement. Strong leadership is essential to unlocking progress and ensuring that competing priorities and viewpoints across teams do not undermine progress. And throughout, leaders will need to grapple with complex trade-offs and vital questions around data ethics, privacy and transparency.¹⁶

It is important to acknowledge the complexity of the challenge. Even examining a case management process quickly shows that improvements require behaviour changes from up to a dozen government agencies, the judiciary, thousands of legal firms and independent practitioners (in different roles), disparate service users with varying needs (victims, witnesses, accused). The details that make things difficult are myriad. For example, it is typical for the names and contact details of prosecution witnesses to be withheld from defence teams to protect anonymity. But both victim care teams (where they exist) and defence teams need this information to help ensure witnesses are properly engaged and updated throughout a criminal proceeding. Criminal proceedings are also dynamic processes: many systems struggle with the splitting and merging cases, for example. The dispersed geography of courts alone, let alone partner agencies, is a huge issue. Matching the ambition and pace of change with appropriate resources and leadership focus is essential.

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Opportunities to see that change in action

Building on this technology ecosystem approach, interconnected technology, policy, workforce and behavioural factors could to be brought together to help galvanise change in three areas of immense opportunity. Each opportunity blends the power of data, advanced analytics and virtual working in some way – and they also share a focus on redesigning services around users and community needs, and reshaping policy based on evidence. Our research highlighted that many countries are struggling with growing court backlogs, the high cost – and limited effectiveness – of prison and consistently high levels of reoffending.

So we focus on how technology can be part of the solution to these issues, drawing on our experience in criminal justice and other sectors:

1. Harnessing digital twin capabilities to reduce court backlogs
2. Making virtual prisons a reality
3. Virtual rehabilitation through digital desistance platforms



Opportunity 1: Harnessing digital-twin capabilities to reduce court backlogs



Our work has highlighted a universal problem of growing backlogs in lower and higher courts across the world as a result of the COVID-19 epidemic. In some countries, backlogs were already growing before the epidemic, so returning to pre-COVID-19 levels of productivity may not address the issue. There will likely need to be new capacity: not easy given the timescales for developing and appointing legal talent. And there will likely need to be relentless focus on helping to ensure that the system is not wasting the time and talents of professionals or the public.

The problem of court backlogs is extremely knotty. Delays are not only a problem in themselves; they can create devastating downward spirals. Legal administrators and professionals report that when there are long delays before hearings, defendants are less likely to enter guilty pleas, for example – leading to the same caseload requiring more court time.¹⁷ Defence teams might avoid pleading early in the hope that the quality of evidence will have eroded by the time of trial – with victim or witness recollection and willingness to testify impeded by the passage of time.

Defendants with strong evidence against them might, meanwhile, simply feel that whereas delaying the inevitable by months feels a bit pointless (“better not to have it hanging over me”) delaying for three years feels like meaningful (“maybe it’ll never happen”).

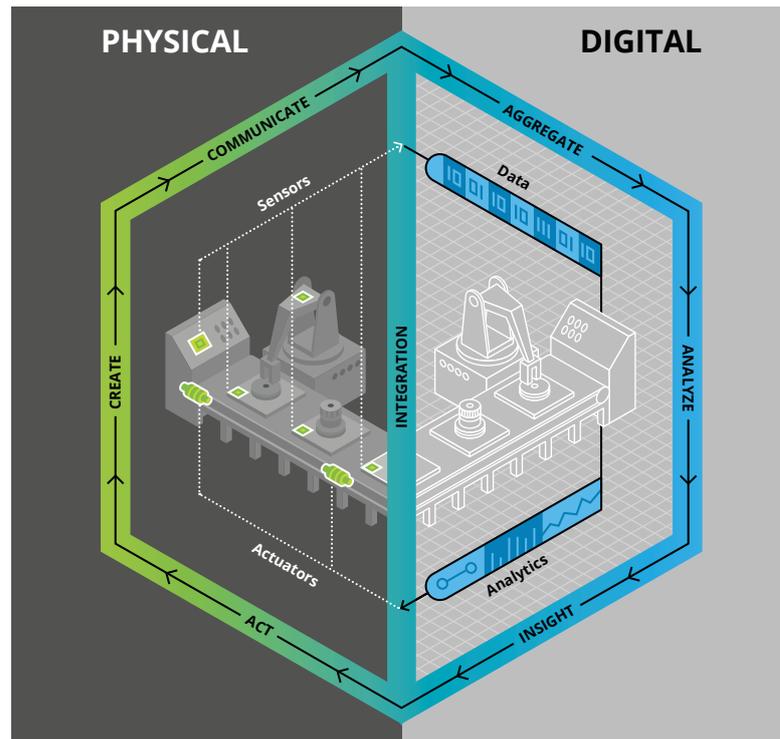
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As well as appropriate resources, there is a need to identify and eliminate the delays and rework that can increase the time trials take. One Australian state official explained the frequency of such incidents. For example, she reported, “the first appearance in court routinely has the duty solicitor/legal representation waiting on documents from the prosecutor and attending with only tentative documentation... meaning that processes cannot be completed and/or fulfilled at that appearance.”¹⁸ Similarly, it is not uncommon for translators to be unavailable when needed – perhaps due to frequent rescheduling or for witnesses to appear at the wrong place or time.

The critical problem here is one of co-ordinating the various moving parts that are often required for court hearings: understanding who needs to be involved, for how long, when and in what sequence to secure justice. And it is a problem that has been solved – at least to a greater extent – in other industries and parts of the public sector through digital twin techniques (Figure 5).

Figure 5: Digital Twins

A digital twin, as we've written elsewhere, is *"an evolving digital profile of the historical and current behavior of a physical object or process that helps optimize business performance."* It is the exact digital replica of a physical entity, bringing the benefits of digital analysis to the physical world:



Source: Deloitte University Press.

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'Digital twins' initially came to prominence in the realm of manufacturing. By the 2000s, virtual replicas of jet engines and gas turbines were tracking wear and tear in order to predict when machines and components required maintenance or replacement, and to maximise operational efficiency. From single assets, digital twins were then scaled up to model whole production lines. With a clear understanding of how different machines and processes would interact, manufacturers could optimize production processes on the fly to match variations in demand. In this way, Maserati digitally modelled its production line to improve the positioning of factory robots and eliminate inefficient movement and reported it improved facility throughput threefold.¹⁹

Digital twins also started to extend beyond the factory floor into the wider world. Recently, organisations have been creating digital twins that mirror the operation of entire organisations or even entire cities. For example, Singapore's ambitious Virtual Singapore initiative enables everything from planning for cell towers and solar cells to simulating traffic patterns and foot traffic. There is potential to use the system to manage public emergencies, for example should there need to be an emergency evacuation, during the city's annual Formula 1 racing spectacle which closes large parts of the city state.²⁰

But digital twins are more than just planning tools. Especially when paired with enabling technologies such as AI/ML or virtual reality they can do everything **from hyper-realistic training to managing the impact of a cyber attack in real time**. For example, one military service has paired digital twins of some of its common aircraft with inexpensive VR goggles to allow trainee pilots to fly many different aircraft quickly, re-fly their real-world training flights, and even get custom feedback based on eye movements, all in their own homes.²¹ The programme cut pilot training time in half. Uses like this can help justice systems model complex systems, train staff, and react to uncertain situations in ways never before possible.

A relevant example of public sector use of Digital Twin techniques comes from 17 NHS Trusts in the UK that are now using an advanced analytics application that interfaces with NHS theatre systems to support optimal booking of theatre sessions. The Advanced Theatres Optimisation Method application runs an algorithm that uses machine learning, natural language processing ('NLP') and data science techniques to determine the accurate booking time required for a procedure – the "ATOM Times". Algorithms calculate the times required based on a range of information on the procedure and patients, theatre-related factors, and the differences in times required at the individual surgeon level, whose participation is voluntary (9 in 10 usually sign up). As well as supporting scheduling, the application is a tool for allowing managers and surgeons to examine utilisation rates and learn about drivers – and utilisation have increased by an average of 11% in Trusts that use the tool.

Deloitte's FutureScape™, a modeling and simulation platform that creates digital replicas of large systems – like those in a city or an entire region – shows that such approaches can also be applied in still more complex areas.^{xx}

In relation to the challenge of physical and virtual courts utilisation, analytics can support ever-improving estimates of upcoming demand (potentially using data from police and prosecution services) and can start to create estimates of the required court and professional time required by cases based on their measurable attributes (for example, offence type, number of victims, witnesses, and accused, legal team compositions, etc.). In some cases, it might be possible to identify cases that could equally be dealt with by out of court disposals – and experience in British Columbia and elsewhere has proven that civil cases can certainly be diverted to mediation and online channels.²³ And the system could make recommendations for how to reduce backlogs – for example, if speeding cases account for significant volumes a recommendation might be made to the offender and the judge, and review and acceptance by both parties would clear the case.

After estimating time requirements initially, these can then be adjusted as cases progress through various gateways or stages building constantly improving estimates.

Then, demand estimates can be matched against staff capacity and rostering patterns, physical and virtual court capacity and other resourcing patterns to support scheduling of activities and attendances. By highlighting in real time where delays are emerging, a digital twin could either provide information to professionals to adjust timings or trigger automated rescheduling activities or notifications. Existing work done in the UK and Canada around 'nudging' attendance in court through carefully worded reminders (for example, in SMS messages) can be harnessed within the design of the system – which would create a ready-made laboratory for testing different approaches to supporting efficient and effective hearings. Equally important, a reporting system would highlight the areas that are consistently causing delay, helping administrators to fully pinpoint the drivers of delays and rework.

More radical opportunities can arise when considering the criminal justice system as an entire end-to-end process. If a factor in case delays is the time required by police to investigate rather than court processes, resources can be reprioritised towards this bottleneck. And court bottlenecks should also increase the already significant imperative to invest in preventing crime and making full use of all out of court disposals, where appropriate.

The key to progress, however, is to focus on a specific, smaller challenge first and demonstrate results. In a related field, the UK Ministry of Justice recently piloted the use of robots to process simple administrative tasks such as processing requests for parental leave. For courts, a similar first step might be to build tools to identify the key drivers of case complexity and hearing duration. Whatever approach is taken, there is potential to quickly learn from results. Because a new approach to reducing backlogs underpinned by digital twin techniques can be applied locally, it should be possible to truly test and demonstrate their impact on productivity.²⁴

Opportunity 2: Making virtual prisons a reality



Innovations in [prisons in response to COVID-19](#) included greater use of virtual visitation and education and additional in-cell technology access.²⁵ These changes – generally well-regarded by people in prison and staff – built on existing service initiatives such as digital kiosks, which allow prisoners to organise their time, access to medicine and food, and scheduling. COVID-19 also triggered greater attention to overcrowding and hygiene in prisons – with officials realising the public health and safety implications in places of high overcrowding.²⁶ Academic research is increasingly showing that traditional prison building designs and conditions are fundamentally damaging to mental health and recovery.²⁷ Many regimes promote obesity and poor physical health. So COVID-19 has also energised innovators who promote (and in countries such as Norway, have built) secure facilities with therapeutic, health-oriented designs.

Despite such improvements, however, prison is still incredibly costly and relatively ineffective in terms of reducing crime.²⁸ Costs internationally vary widely depending on prison security levels, officer wages and other factors but annual costs per prisoner typically range from around \$20,000 for overcrowded low or moderate security facilities in low wage places to \$100,000 per year for a high security prison place.²⁹ Officials and campaign groups cite such figures widely, even though they risk a huge underestimate of the true costs of prison – failing as they usually do to factor in capital costs for building and maintenance which can add half as much again (or even more) to the lifetime costs of a prison place.³⁰

Prisons built in the prison construction booms of the 1980s and 90s are beginning to degrade, and contracts for those built and managed under long-term private finance initiatives are often nearing their end.³¹ In many countries, the costs of trying to maintain 19th century prisons is soaring.

There may be alternatives to the cost of replacing older prisons that could deliver better outcomes in terms of public safety but these would likely require us to embrace more radical innovation in a system of punishment that has existed for centuries. We must answer the question one UK official posed to us, 'what does deprivation of liberty mean in the new world?'³²

The idea of the virtual prison can be a tricky concept to grasp, so wedded are we to the nineteenth century prison as our symbol of punishment. But essentially the term encapsulates a new-found ability through technology to emulate some of the characteristics of prison that the need for those who have committed crimes to serve penance, make reparations and be confined for public safety.

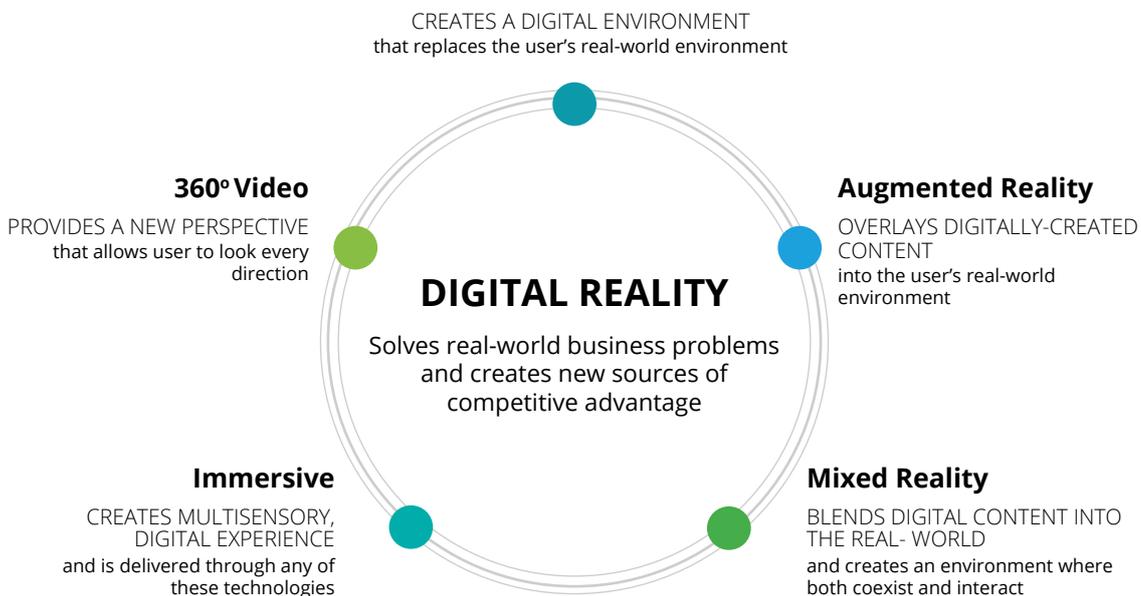
Electronic monitoring, in the form of tags, already makes use of location tracking, GPS and radio-frequency technologies. But improvements in geo-coding and time stamping now allow more accuracy, and data can be augmented by analytic tools, for example drawing on other data to cross-reference the location of those under supervision with crime reports. This will create huge scope to enforce additional restrictions on where those in 'virtual prisons' go (perhaps nowhere), who they associate with and what they do. Other technological advances may be relevant. Many cities and states already deploy sobriety monitors that prevent those with a history of driving under the influence of alcohol from starting their car without first passing a breathalyzer test. In 2020, the UK passed legislation authorising the use of ankle bracelets that could monitor blood alcohol levels for those with alcohol-related convictions. And fingerprint drug testing is advancing rapidly, meaning in home testing kits could soon be accurate and difficult to 'game'.³³

Health monitors can be used to track heart rate and monitor stressful situations. On top of such restrictions, there is the opportunity to make use of virtual reality for those under house arrest or curfew to recreate the privations of prison by requiring a certain number of hours in VR headset solitude.

Far from being *less* punitive, the key risk is that digital privations could become too extreme – triggering non-compliance or psychological harm. Attention would need to be paid to visitation and socialisation, as it is in physical prison environments. And, just as in the use of prison or systems of prison privileges or solitary confinement, the ethical issues posed when considering new systems must be contemplated carefully. There is already some evidence that electronic monitoring has been used too indiscriminately, restricting liberties excessively because the punitive impact of its use is understated.³⁴

Rehabilitation could arguably be better supported through virtual punishments too. First, there is potential to provide controlled freedom – for example, to access permitted educational or job preparation activities. Second, there are opportunities to harness the tools of digital reality (Figure 6) to support education, training, and personal resilience. Prisoners are already using virtual and augmented reality to support remote learning (for example, plumbing courses), but as commercial offerings in this area proliferate the quality of these offerings will rapidly increase and costs reduce. Several services are evolving that could provide those in virtual prison with touch access to eco-system of broader digital support from a tablet or mobile device, harnessing approaches from behavioural sciences to incentivise and support engagement and pro-social behaviours.

Figure 6: Digital reality technologies allow seamless use of digital data



Source: Deloitte Consulting LLP, Consumer Technology Association.

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Supervisors could engage with virtual prisoners in their own home through 360 degree video, but would also benefit from advanced analytics to inform risk-based decisions – receiving, for example, alerts when risks of offending are escalating and potentially triggering security upgrades, professional assessments of offending risks and/ or support interventions. On occasion – perhaps for those who have committed more serious offences or carry higher risks to public safety – this might mean temporary placement in a secure facility.

There are challenges to overcome. Assuming rigorous testing, breaches of conditions or criminal offences committed under such levels of supervision would likely be detected. But they would still be possible. A sensible regime would allow for small infractions, such as a prisoner leaving their permitted zone in the case of a medical emergency. But larger infractions may lead to being incarcerated in a bricks-and-mortar prison. Some people would, of course, not be suitable for virtual prison confinement, though to generate full savings and benefits virtual prisons would need to be an alternative for those currently receiving prison terms – not simply a way of ‘toughening up’ community punishments.

But the biggest challenges are arguable political and ethical. Unless virtual prisons are recognised as satisfactory punishment for offences that currently result in prison terms, they will not succeed – so public and judicial engagement in design and implementation of virtual prison regimes is critical. The restriction of human liberty is also as contentious an ethical question as it has ever been: and a fundamental re-engagement with what punishment is and should be offers an opportunity for a renewed debate.

However, the prize for bold thinking in this area is vast. The challenges of virtual prisons are similar to those of the bricks and mortar institutions. But the costs are far lower, and the potential to support much more effective rehabilitation are too important to ignore.

A sensible regime would allow for small infractions, such as a prisoner leaving their permitted zone in the case of a medical emergency.



Opportunity 3: Virtual rehabilitation through desistance platforms



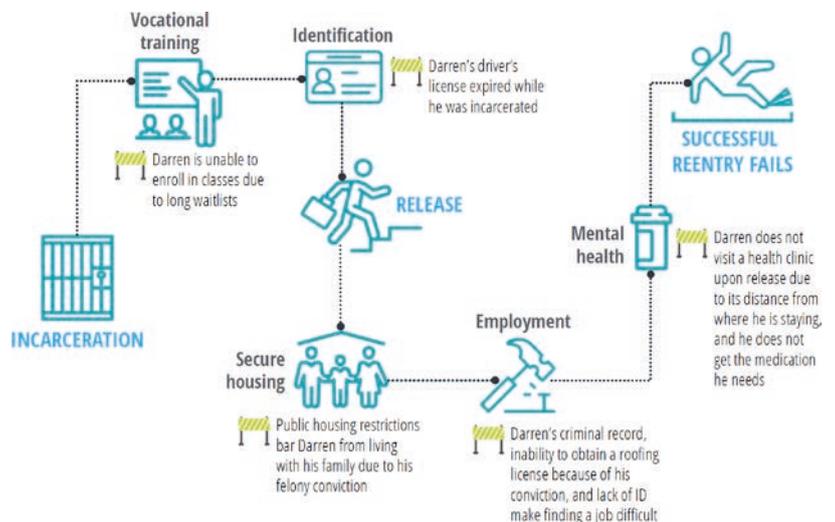
Many of the tools that could be used to create virtual prisons that both manage risks and rehabilitate will likely be equally relevant to the broader challenge of supporting the rehabilitation of people under supervision. High rates of reoffending remain the norm across the countries involved in our future of criminal justice project. A central issue is difficulties in reintegrating those released from prison due to a range of practical barriers as well as insufficient support. Disjointed services are another critical problem (figure 7).

Today, however, there is now an unparalleled opportunity to build a fully digitally enabled approach to reducing recidivism that address these issues – and provides people with convictions with both the in person and virtual support they need in order to desist from crime.

User-focused applications, drawing on data and multiple analytic tools, could again be the cornerstones of new approaches. For an individual with a conviction, a simple application could help with pre-release planning for those in prison – enabling and tracking applications for housing, employment, health services and other supports. And scheduling tool can support pre-meets with parole officers and any mentors made available to support reintegration. This ‘through the gate’ approach, allows continuity of service beyond prisons.

Post release, the same platform could be used to access continued support, and to meet terms of probation. Notifications and ‘nudges’ could support attendance at vital appointments, while those under supervision can also check in with probation remotely or prove their compliance with license requirements through geolocation technology. With access to a broad library of support services, rated by service users for their value, those using the platform could easily access voluntary, statutory and commercially provided services. Some could be provided online.

Figure 7: Rehabilitation pitfalls



Source: Deloitte analysis

For example, computer-assisted therapies, such as the Breaking Free recovery support programme are now proven to be effective at tackling addiction and depression, and can deliver bespoke help quicker than the other options that exist in prison and the community.³⁵ Chat functions can also support the creation of support communities, including mentors as well as peers.

Over time, information builds on service impacts on reoffending and linked outcomes using advanced analytics. And this information can combine ratings to support more meaningful choices and agency for people with convictions. Functionality can all reside in a single application loaded onto a smartphone, effectively creating a mobile platform that supports desistance that can be accessed 24/7.

An effective desistance platform could have at least two different user interfaces. While people with convictions see the services and information they need to maintain compliance with license conditions, corrections staff will access a different interface. Data on activities by offenders can feed through into visualised dashboards to help corrections officers assess risk. And machine learning could support improved risk modelling, helping to create more accurate risk assessments than are possible with human judgement alone. This will allow more individually appropriate (and fairer) sanctions – with the system also recording the longer-term reoffending impacts of these decisions. Such systems could also provide clearer audit trails for decisions – and support a transformation in the nature of corrections work, allowing correctional officers to focus their time on human interactions rather than administration and much more evidence-led (Figure 8).

Building on this, supervision can become more dynamic. Conforming to supervision requirements might reduce the requirements around visits and check-ins; while failure to conform would result in closer observation.

Many service users already expect a digital solution and a number of digital platforms are already delivering desistance platforms that make use of some of these approaches. Social enterprises have created an application to support those on probation in London, and its use is expanding to support individuals on police bail. Their platform provides a wide range of tools for accessing services and support and for managing risk. Another software tool provides an application that is used in UK prisons (on prison-provided tablets) and the community.

The critical question for how this landscape evolves is arguably one of how to foster innovation and competition between new applications in this area, while ensuring that government retains ownership of key insights and data that such platforms enable. We urge an open approach allowing many organisations to participate, but protecting government access to key information and maintaining robust data and security standards.

Figure 8: Criminal Redirection Officer: An example of the “Future of Work” in justice systems

Technology advances, changing demographics, and the growing influence of consumers and talent markets are reshaping the future of work, creating opportunities as well as threats. Justice is no exception, where new technologies and social shifts could also create opportunities for new types of work, such as a **criminal redirection officer**.

Criminal redirection officers (CROs) would be tasked with the mission of managing virtually incarcerated offenders and ultimately rehabilitating them into society. They use enabling technologies and principles from the study of human behaviour to achieve superior outcomes compared to parole officers today.

Criminal redirection officers work with low-risk and non-violent offenders who qualify to be virtually incarcerated and move within designated areas like their homes and workplaces. Using a suite of digital tools, they monitor many aspects of an offender’s life—physical location, proximity to other offenders, and drug or alcohol use, as well as ties to community, family, and employment—to help ensure compliance with the programme’s requirements.

Their mission is not just helping to ensure offenders serve time but helping to make sure that in that time, they are equipped with skills, resources and behaviors that will help them successfully rejoin society and prevent recidivism. To do this, the CRO makes use of a toolkit of modern technology:

Training programs and MOOCs to connect offenders to appropriate employment, housing assistance and counseling; AI and analytics-based tools use historical and real time data to inform the CRO’s action plans; and gamification—a system of points, badges and rewards—to incentivize pro-social behavior.

Thanks to the role CROs play, they are able to help ease burdens on overcrowded prison systems and refocus criminal justice on reformation and rehabilitation instead of mass incarceration.

Click image or [here](#) to see a sample job profile, tool kit, and even day in the life of a criminal redirection officer.

To learn more about government jobs of the future, [click here](#).



Commonalities and conclusions

The criminal justice system of the future will undoubtedly look and feel considerably different to the one we know today. But the critical question is how quickly justice agencies can develop services that support better experiences for victims, witnesses and people trying to live crime free lives. Much depends on the appreciation of the human side of technology enabled change: both in terms of creating a justice workforce and leadership that is comfortable with change and new technologies, and in terms of designing services that support behaviour change. As a Canadian corrections leader told us, *“if we want to be more transformative [and] shift to root causes of crime... they are human problems not legal problems, we need to expand the envelope of people we invite to help be that change”*.

The public care about the approach to criminal justice and will need to **be engaged in the policy decisions** that are required to create innovation. Ethical issues, including digital exclusion risks, need to be addressed and considered early in the change process.

However, that these human challenges – and the more technical ones that accompany them – are clearly surmountable. Many governments are already pursuing significant technology-enabled service improvements in criminal justice and are aiming to achieve even more in the coming years. With a focus on the long-term goal of building a digital ecosystem that support service users, and an initial focus on the problems that are most pressing in criminal justice today, they can succeed.

The public care about the approach to criminal justice and will need to be engaged in the policy decisions that are required to create innovation.



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Further reading

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