



# DIGICOR

Digital Technologies in Prison  
a review of literature and practice

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## Introduction

Information and communications technology (ICT) is fundamental in how people communicate and interact. This review considers how ICT is integrated into the social lives of prisons. Research on implementing technology in corrections is relatively scarce (Mufarreh, Waitkus and Booker, 2021), but most analyses report inmates<sup>1</sup> limited access to digital technology. When discussing inmates' access to technology, studies refer to the digital divide, understood as a form of social exclusion, further exacerbated upon prison release (Kerr and Willis 2018). While there are studies that reflect on the impact of digital skills on democratic life, information to which citizens would have access on the outside is difficult to replicate inside prisons. This has growing implications for reintegration, and authors urge us to rethink reintegration and imprisonment in the context of the whole democratic society (Reichenbach and Bruns 2018). Furthermore, the Covid-19 lockdown led to a temporary closure of face-to-face meetings between inmates, family, and educators, aggravating inmates' need to access technology. Introducing and implementing ICT in prisons has the potential of bridging the digital divide, transforming, at the same time, the daily lived experience of inmates (Kerr and Willis 2018).

The review aims to identify literature on the adoption of technology in corrections. Departing from the distinction between availability and uptake of digital technologies in the correctional field, this paper seeks to identify the available technology and its uptake by stakeholders involved. To this end, the review focuses on several categories of digital technologies, as follows:

- ◆ Inmate telecommunication technologies (phones, in-cell phones, video calls and video visitation)
- ◆ Videoconferencing with courts
- ◆ E-learning
- ◆ Telemedicine
- ◆ Devices: kiosks, in-cell devices, tablets
- ◆ Electronic monitoring or tracking technologies and telephone supervision
- ◆ Programmes.

The following inclusion criteria were met:

- ◆ Mostly materials published between 2017 and 2022;
- ◆ Peer-review publications were given special priority;
- ◆ Europe-based research was given special priority;
- ◆ Indexed in databases such as Google Scholar, Jstor, and SAGE.
- ◆ Grey literature and media publications.<sup>2</sup>

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<sup>1</sup> For the purpose of this report, we will use the term “inmate” when referring to an incarcerated person.

<sup>2</sup> The data collection process was conducted independently by two researchers from European Strategies Consulting and IPS Innovative Prison Systems.

## Prisoner telecommunication technologies

### Promoting family links

Over the past decades, research has consistently shown that prison visitation, together with regular contact of inmates with their relatives, positively affects their behaviour, significantly contributes to social reinsertion, and reduces recidivism. Family support and the maintenance of social ties of persons deprived of liberty are often mentioned in criminological theories as essential elements of crime prevention. According to Hirschi's Theory of Social Control (1969), social ties between individuals and society, conventional institutions, values, and activities are crucial in deterring deviant behaviour and preventing criminal recidivism.

Empirical evidence also shows that increased availability of secure communication (phone, video visits, message systems) has a positive impact on prison security, reducing tensions and conflicts, reducing the number of illegal mobile phones and their attempted entry which otherwise would often generate corruption, debt, violence, and extortions inside and outside the prison environment (Bredin, S., 2018). Several studies highlight that incarcerated people with supportive family relationships are more likely to avoid engaging in illegal activities while serving a sentence, end their criminal careers, and are therefore less likely to relapse (Glaze, L. & Maruschak, L., 2008; Shinkfield, A. & Graham, 2009; Duwe, 2021).

Regular contact through visits, telephone, and written communication during detention helps maintain or strengthen social support networks. Family contact not only prevents detainees from establishing a criminal identity but also provides them with the necessary conditions to avoid recidivism in liberation, namely: family support and housing or financial support (Clark, T., 2001; Rocque, M., Bierie, D. and MacKenzie, D., 2010; Cochran, J. et al., 2016).

In a meta-analysis presented by Campbell Collaboration, 16 studies (Mitchel, 2016) were evaluated, indicating that prison visitation generates relevant results in reducing recidivism. Overall, prison visits resulted in a 26% reduction in recidivism. Twelve primary studies found that prison visits decreased recidivism between 3% and 62%. Other studies indicate that detainees depend not only on their families to facilitate the process of adapting to the prison system but also to increase opportunities for effective reintegration. These findings corroborate Martinez and Christian's study (2009), which shows that maintaining contact between prisoners and their families and maintaining prosocial relationships leads to lower recidivism rates. A recent study developed by Duwe and McNeeley (2020) compared recidivism results among inmates who had at least one video visit with a group of inmates who did not receive any virtual visit, showing that as the number of video visits increases, also recidivism decreases.

## Inmate Secure Telephony

**TELEPHONES** represent one of the most widespread technologies available in prisons.

In Europe, the situation regarding the use of phones is very heterogeneous. The use of phones by inmates is mainly limited to a certain number of pre-screened and pre-allowed phone numbers (whitelist), to a certain number of minutes per call, day, and week. A few European countries have reduced some of the limitations regarding the duration of phone calls, the persons that can be called (blacklisting only the ones that cannot be called), allowing longer phone calls and calling periods, among other restrictions.

Phone calls that used to be provided under the public service provisions of government telephony framework contracts regarding the provision of public phones by traditional TelCo suppliers have progressively been replaced by specialised operators who have invested in developing secure telephony systems, invest in infrastructure and secure devices.

Recently, the debate has unfolded around the issue of introducing **IN-CELL TELEPHONES** instead of along hall or wing-based telephones. In the past five years, France (Bredin, S., 2018)<sup>3</sup>, Portugal (Mateus, 2021)<sup>4</sup> and the United Kingdom, among others in Europe, have increased access to in-cell telephones, with the added benefit of reducing the number of illicit mobile phones in prisons (Palmer, Hatcher and Tonkin 2020, 19).<sup>5</sup>

Compared to using wing or hall telephones, the possibility of using a phone inside the cell allows inmates higher privacy for family calls and more considerable periods for phone conversations (including "after-hour" calls to their families), reducing the need for the use of illegal phones. In-cell telephony is also essential in reducing tensions and conflicts between inmates and between inmates and staff, reducing the staff's need for accompanying and monitoring inmates while on phone calls outside the cell or cell corridors.

### Prison phone rates: Europe

In Europe, the cost of phone calls is supported by inmates and their families<sup>6</sup>, not subsidised by state funding.

Some studies point to the high costs of prison calls. Inmates have a few payment options: in the U.S., these are collect calls, debit, or prepaid accounts (Fuchs 2019). The U.K. opts for

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<sup>3</sup> Bredin, S. (2018). Correctional reform in France: more prison places, less incarcerations. Interview: Stéphane Bredin Director General of the Prison Administration, France. 3<sup>rd</sup> Edition, June 2018. Pp.34-39. Available: <https://justice-trends.press/correctional-reform-in-france-more-prison-places-less-incarcerations/>

<sup>4</sup> Mateus, R. (2021): Challenges and priorities for the Portuguese prison system... And the ongoing transformation despite COVID-19. JUSTICE TRENDS Magazine, Edition nr7, June 2021. Available: <https://justice-trends.press/challenges-and-priorities-for-the-portuguese-prison-system-and-the-ongoing-transformation-despite-covid-19/>

<sup>5</sup> Examples from the UK, France, and Portugal: "In-cell phones for more prisons in drive to cut crime". Available in: <https://www.gov.uk/government/news/in-cell-phones-for-more-prisons-in-drive-to-cut-crime> ; "La prison de la Santé rouvre équipée brouilleurs et de telephones fixes". Available in: [https://www.lepoint.fr/justice/la-prison-de-la-sante-rouvre-equipee-de-brouilleurs-et-de-telephones-fixes-07-01-2019-2283773\\_2386.php](https://www.lepoint.fr/justice/la-prison-de-la-sante-rouvre-equipee-de-brouilleurs-et-de-telephones-fixes-07-01-2019-2283773_2386.php) ; "The government will install 150 telephone booths in the prisons". Available in: <https://tvi24.iol.pt/sociedade/ministra-da-justica/governo-vai-instalar-150-cabines-telefonicas-nas-prisoas>; "The government approves new law to install phones in prison cells". Available in: [https://www.sapo.pt/noticias/atualidade/governo-aprova-decreto-sobre-instalacao-de\\_630797a5c9a1265914db1c0f](https://www.sapo.pt/noticias/atualidade/governo-aprova-decreto-sobre-instalacao-de_630797a5c9a1265914db1c0f)

<sup>6</sup> Some exceptions are made for foreign inmates or inmates that may not have any source of income.

telephone credit as a weekly canteen order or daily top-up credit (Palmer, Hatcher and Tonkin 2020). The high costs of prison calls lead to further exclusion of inmates from the outside world and limit their contact with families (Fuchs 2019).<sup>7</sup>

Telephony providers are selected through a competitive process that relies on compliance with technical requirements, service level requirements and the price of calls to the end user. Due to the lack of state investment in telephony infrastructure and prison equipment, private operators are often requested to invest substantial amounts in operating prison telephony systems. These investments are paid back over time in long-term contracts, though the revenue generated by inmate's calls. Therefore, telephony rates (usually a few cents per minute) are highly dependent on the infrastructure and equipment investment that is/was made by private operators. Despite this, governments need to ensure that the amount paid by inmates and their families is fair (considering the investment made and the cost of the call), in line with call charges in the regular telecommunications market.

### **Prison phone rates: United States of America**

In the United States, due to the extremely high prices charged to inmates and their families, at Federal, State and County levels, prisons and jails, Civil Rights and Human Rights movements have been pushing for inmate communication price reductions for a long time (Vuono-powell, Schweidler, Walters and Zohrabi, 2015). As a result of intense lobbying, in August **2013**, the FCC Federal Communications Commission decided on "*Reforms Bring relief to millions of families by reducing the cost of interstate long-distance calls,*" requiring that all interstate inmate calling rates, including ancillary charges, be based on the cost of providing the inmate calling service and stating what would be considered fair rates (safe-harbour rates)<sup>8</sup>. In October 2015, the FCC voted 3-2 to cap the rates and fees companies can charge for phone service in prisons and jails.<sup>9</sup> In August **2020**, the FCC issued a statement proposing (...) "*to reduce its interstate rate caps substantially—currently \$0.21 per minute for debit and prepaid calls and \$0.25 per minute for collect calls—to \$0.14 per minute for debit, prepaid, and collect calls from prisons, and \$0.16 per minute for debit, prepaid, and collect calls from jails. The FCC's proposed interstate rate caps use a methodology that addresses the flaws identified by the D.C. Circuit underlying the Commission's 2015 and 2016 rate caps and that is consistent with the Communications Act. The Further Notice also proposes to adopt rate caps for international ICS calls for the first time.*" (...).<sup>10</sup>

<sup>7</sup> Fuchs (2019) goes so far as to name the exorbitant prices of prison calls, especially of long-distance rates as exploitative. The prison payphone market benefits, the author argues, from the low-income tiers of American society. A similar argument is forwarded by Onifade (2020).

<sup>8</sup> FCC Reduces High Long-Distance Calling Rates Paid by Inmates: <https://www.fcc.gov/document/fcc-reduces-high-long-distance-calling-rates-paid-inmates>

<sup>9</sup> In his address, the FCC Commissioner Mignon Clyburn (Democrat) said: (...) "*The truth is that each of us is paying a heavy price for what is now a predatory, failed market regime. None of us would consider ever paying \$500 a month for a voice-only service where calls are dropped for seemingly no reason, where fees and commissions could be as high as 60% per call and, if we are not careful, where a four-minute call could cost us a whopping \$54.*" (...) (...) "*Voting to endorse today's reforms will eliminate the most egregious case of market failure I have ever seen in my 17 years as a state and federal regulator. Adopting rate caps for all local and long-distance calls from correctional facilities, eliminating and capping an endless array of fees, ensuring that every call made from a prison or jail has a rate that is just, reasonable, and fair, and closing loopholes will make us truly compliant with those pillars so clearly laid out in the Communications Act. Calls from any state or federal prison in this nation will soon be capped at 11 cents a minute, and, except for three capped fees, all other secret or oblique fees are done.*" (...). Available here: <https://docs.fcc.gov/public/attachments/DOC-335984A3.docx>

<sup>10</sup> FCC Seeks to Reduce Rates and Charges for Inmate Calling Services: <https://www.fcc.gov/document/fcc-seeks-reduce-rates-and-charges-inmate-calling-services>



email. Some researchers encourage inmates' access to email as a cost-effective form of social control by reducing the incidence of smuggling contraband or illicit goods into physical mail (*idem*). In the U.K. and the United States, besides email, **VOICE MAIL** systems have been implemented for inmates to exchange messages regularly - through a secure, controlled system – available to authorised family members and friends. Those deprived of their liberty and their families said that using these technological solutions positively affected health and well-being, social relationships and ties and the resolution of practical problems (Sakala, L. 2013).

An article on the German context published before the Covid-19 pandemic already outlines the opportunities and challenges of using digital media for communicating with relatives. Further, the article underlines Germany's constitutional responsibility to support connections within the marriage to families, which also applies to inmates. In addressing these questions, the report speaks to the extent to which the rapidly progressing digitalisation of society also challenges the penal system (Kawamura-Reindl 2019).

Even though these solutions have been implemented in prisons before the pandemic, in the wake of the Covid-19 crisis and the restrictions imposed, **VIDEOCONFERENCING AND ONLINE VISITATION** have emerged as critical responses to the pandemic, but also with the high costs associated with in-person visitation. Videoconferencing is used for legal proceedings and family visitation (Tartaro and Levy 2017; Kerr and Willis 2018). In 43 states in the United States, inmates pay to video-chat families. Some prison contractors distribute free iPads, charging for email and music downloads<sup>18</sup> (Fuchs 2019, 212). In the United States, video visitation is arranged either as lobby video visits through a closed-circuit video system or remote video visitation. The latter requires inmates to visit kiosks that can be placed inside cell blocks (Tartaro and Levy 2017, 6-7).

In Europe, the Covid-19 restrictions allowed for online visits with family, usually arranged through Skype or professional videocall or video-visitation solutions. In the case of Serbia, for instance, the Serbian Penal Administration equipped nine correctional institutions with 16 tablets with a paid internet package of 20 G.B. per month for the following 24 months. This equipment was used by inmates to videocall their families free of charge through the Viber application (Kolaković-Bojović 2021).<sup>19</sup>

England and Wales (provided by Purple Visits<sup>20</sup>), Scotland (provided by Unilink), Northern Ireland in the UK, France, and Spain (both supplied by TELIO) (see Garcia & Lageweg, 2021), among others, have implemented different professional videocall and video visitation solutions. These professional solutions are primarily available to inmates without the need for supervision by a correctional officer, allowing the online scheduling of the call, the automatic identification of the visitor and the person being visited, the automatic

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<sup>18</sup> Fuchs (2019, 212) argues that the costs for inmates are prohibitive, giving the example of Pennsylvania, where inmates who want to read must pay 147\$ in order to access an e-book library.

<sup>19</sup> It is important to mention that there is not enough evidence to support the use of commercial communication solutions (either via Viber, Whatsapp, Skype) in the detriment of solutions intentionally developed for secure environments or in compliance with correctional operations.

<sup>20</sup> <https://www.purplevisits.com/news/supplying-secure-video-calls-across-the-prison-estate/>

identification of alien callers or strange behaviours, call recording and interception for security purposes, etc.

## Correctional education - e-learning

The landscape of online learning in prison is still emergent. E-learning, distance learning, and online education are a few terms used to designate the use of digital technologies to promote continuity in education. E-learning is defined as "ICT-assisted learning provided through either wireless or mobile devices such as virtual learning platforms. There are three categories of e-learning, namely, distance learning, software-assisted teaching and learning, and electronically mediated learning" (Pitikoe 2019, 120).

Since the Covid-19 lockdown has interrupted the flow of face-to-face education in prisons, the need for ICT in correctional education is articulated as a necessity. According to the Report Review of European Prison Education Policy and the Council of Europe Recommendation (89)12 on Education in Prison, "prison authorities should invest in modern digital technology [such as] access to supervised Internet services or Intranet systems" in order to foster the acquisition and access to digital skills that allow inmates to "better manage their lives post-release" (see Figure 1

).

Nevertheless, the available literature shows discontinuity between prescriptive and descriptive situations regarding correctional education. All authors included in this review



acknowledge the benefits associated with implementing ICT in correctional education, such as improvement of literacy (Moreira, Montero, and Machado 2017b) and digital literacy (Taugerbeck et al. 2019), which are crucial for life after release. Moreover, e-learning in prison can help reduce the digital divide (Knight and Hadlington 2018; Prison Learning Alliance 2020) and fosters digital inclusion (Vryonides 2020). The acquisition of new skills (Prison Learning Alliance 2020), especially professional know-how (Moreira, Montero, and Machado 2017a), is mentioned. Beyond personal development, access to ICT-mediated learning can help people to strengthen relationships with people inside and outside prison, providing detainees with a sense of purpose (Prison Learning Alliance 2020). The same study associates learning in prison with a lower risk of reoffending (*idem*; also in Pitikoe 2019). Using ICT in prisons is part of a larger

framework of "digital rehabilitation" (Reisdorf and Rikard 2018; Monteiro, Barros and Leite 2015) aimed at using technology as part of the reentry process by supporting communication with family, learning, and entertainment. Most studies in this review acknowledge the risks associated with introducing ICT in correctional education, mentioning the dire need to

provide secure, restricted intranet and internet access to detainees to increase digital literacy and inclusion.

An example from Germany illustrates the importance of digital learning in the German labour market. In his article, Jens Borchert (2018) makes the important point that correctional systems are part of a society which is currently undergoing considerable change. This impacts the rehabilitative prospects of inmates in the local labour market: getting and keeping a job are essential markers for successful reintegration. Specifically, in Germany, this means:

- ◆ *in the world of work*: the threat of many jobs disappearing; low jobs; low pay for many jobs and low attractiveness;
- ◆ change in the media with enormous and considerable effects on our lives in the coming years (working and learning from home, digital and learning from home, digital illiteracy);
- ◆ *in the population*: changes in density with a significant decline in many rural areas with urbanisation in individual conurbations.

The studies included in this review remark, at the same time, the precarious state of online education in prison and provide recommendations for a better infrastructure of e-learning (Hesselink 2018; Pitikoe 2019; Barros, Monteiro and Leite 2021). According to Pillera (2015), there are only a few countries in Europe where ICT is integrated into correctional education nationally (see **Erro! A origem da referência não foi encontrada.**). These countries are Sweden, Finland, Germany, Netherlands, Switzerland, Spain, and the U.K. Other countries are mentioned as having local experiences in digital technologies in prison but lacking a national framework or commitment to implementing ICT in correctional education (countries such as Iceland, Latvia, Romania and so on), and others lacking digital e-learning technologies altogether (such as Ukraine, Belarus, Poland).

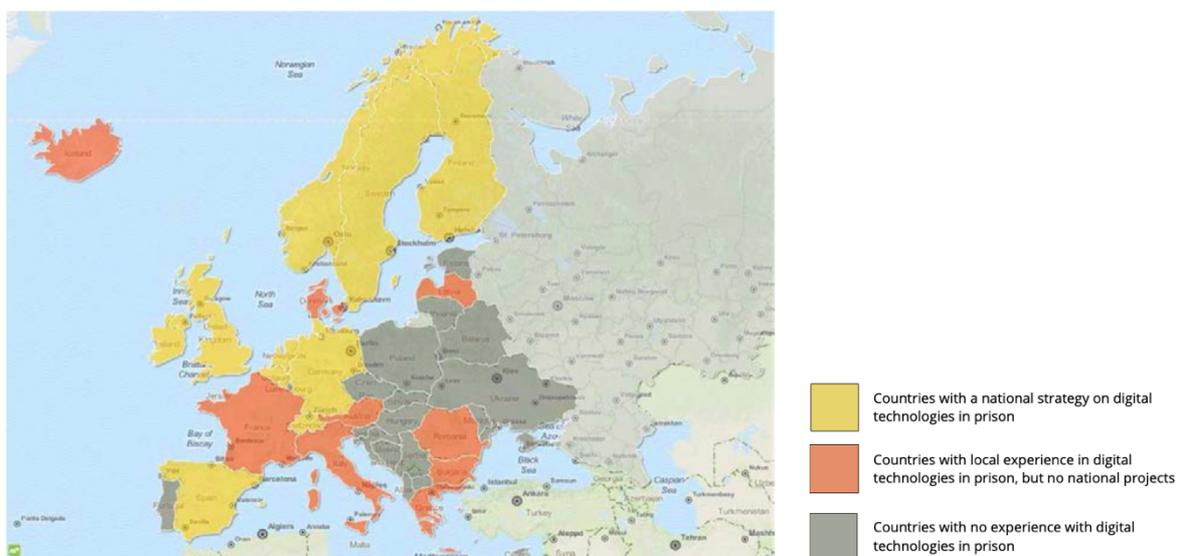


Figure 2: ICT in correctional education in Europe

A review of e-learning in European prisons published in 2010 (Hammerschick 2010) shows that network solutions for e-learning exist at least in Austria, Belgium, Denmark, France, Germany, the Netherlands, Ireland, Norway, Spain, Sweden, and the U.K. This review has identified similar solutions in Portugal. It is expected that the Covid-19 pandemic has furthered the possibilities for e-learning in corrections throughout Europe.

The United Kingdom was among the first to introduce e-learning in prisons (Pillera 2015, 350), proposing a secure intranet (**VIRTUAL CAMPUS**) to foster skill acquisition and continuity in correctional education. The Virtual Campus platform is accessible to most inmates (save for certain high-risk groups), allows for flexibility and continuity of studies (in the case of prison transfers), and stores data and content in a cloud system that can be accessed after release (*idem*). This technology is available under tutor supervision in all prisons in England and Wales (Prison Learning Alliance 2020). There are some downsides to the platform - studies report that the systems are not always functional and that inmates are "not always escorted to the communal locations [where laptops are] by prison officers" (*idem*, p.3). Others report that the content provided is outdated and lacks interactivity features, the platform functions slowly, and there are bandwidth problems and confusion about the licence (Pillera 2015, 351). The Virtual Campus platform is also used in some prisons in Portugal (Moreira, Montero and Machado 2017a).

Most German Federal States and Austria use E-Lis as the e-learning system for inmates, a system now coordinated by the Institute für Bildung in der Informationsgesellschaft (IBI) in Berlin. The E-lis learning platform has been established in the German prison system since 2004. In 2009, it was taken over by the IBI and underwent a comprehensive revision in the following years. The learning platform is currently used in the federal states of Baden-Württemberg, Berlin, Brandenburg, Bremen, Hamburg, Hesse, Mecklenburg-Western Pomerania, Lower Saxony, North Rhine-Westphalia, Rhineland-Palatinate, Saarland, Saxony and Schleswig-Holstein, as well as in the Republic of Austria. It can be accessed at over 1,200 learning sites in more than 120 correctional facilities via specially secured connections.

According to IBI's website,<sup>21</sup> E-Lis is focused on using digital media in correctional institutions' general education and vocational education areas but can also be used as a tool for social services and recreational activities. The platform offers a comprehensive media library with more than 400 different teaching and learning offers, providing a total of several thousand materials for teaching and independent learning. In addition to (vocational) school materials, programmes for teaching media, social and everyday skills are also offered. Particularly popular are language courses, basic education programmes, access to the media library of the FWU (Institute for Film and Image in Science and Education) or the offline version of Wikipedia, and recreational offers such as fitness training or news in easy language. Moreover, the platform is used as:

- ◆ Learning management system (use of didactic tools such as group management by tutors).
- ◆ Document management (files and exercises in cloud storage)
- ◆ Communication tool (protected emails and forums)

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<sup>21</sup> <https://www.ibi.tu-berlin.de/projekte/259-e-learning-im-strafvollzug>

- ◆ Infrastructure that makes studying at the Fern Universität in Hagen possible.

While many studies issue warnings related to the issues associated with ICT in correctional education, some authors propose mitigating the deficiencies of online education in prison through a mixed approach to teaching and learning. **BLENDED LEARNING** (or b-learning) proposes a combination of face-to-face teaching and computer-mediated teaching and learning methods to ensure the best educational outcomes for detainees. Authors discussing b-learning invoke using Moodle as an educational tool (Trinidad and Moreira 2020; Barros, Monteiro, Leite 2021) and comment on the positive effects of creating virtual learning communities. B-learning has the potential to develop competencies such as "collaboration, communication, creativity or critical thinking" (Trinidad and Moreira 2020). These articles are based on research done in prisons in Portugal (Trinidad and Moreira 2020; Barros, Monteiro, Leite 2021) and Cyprus (Vryonides 2020).

Telfi (Telelernen für HaftinsassInnen, see Hammerschick 2010) is a blended learning solution where teachers offer classes two or three times a week. During the rest of the week, participants work on their assigned tasks independently, accessing software and additional materials. The system is available in Austria, but there is limited evidence that shows Telfi is actually used. Rather, ECDL (European Computer Driving Licence), a standard ICT skills certificate, is more widely used throughout Austrian prisons.

The European Commission has been supporting different projects and initiatives that aim to promote digital learning in prisons. For example, there is the **BLEEP**<sup>22</sup> project on digital inclusion, seeking the creation and implementation of an innovative, Europe-focused, blended learning platform for inmates and former inmates; or the **TRIANGLE**<sup>23</sup> project, which aims to develop a digital platform where young people in closed institutions can develop formal and non-formal learning skills in a secure internet setting.

Other initiatives involve **ACCESS TO LAPTOPS IN CELLS**. A study by Kerr and Willis (2018) shows that some prisons in Canada, the United States, the United Kingdom, the Netherlands, and Australia allow inmates access to educational materials on shared computers but restrict internet access. One pilot by the Ministry of Justice in the U.K. started in 2017<sup>24</sup>. Viewed by inmates as an "incentive for good behaviour" (Prison Learning Alliance, 2020 3), the program allows access to buying phone credit, prison-related communication, mental health advice, and education materials. Albeit nascent, this initiative shows promise by balancing the somewhat mixed picture of initiatives across the prison estate (*idem*). Computers in Cells program is a similar program developed in Australia. The 2018 Prisoner Education Forum strongly suggests that "computers in cells should be provided to inmates as an educational tool" (Justice Action). The first stage of the project intends to hand out 600 Android tablets to women at Dillwynia and men at John Morony prisons in Sydney; the tablets operate through a closed Wi-Fi network giving inmates access to "literacy and numeracy sessions, cognitive behavioural therapy programs and enable them to manage their prison bank accounts online" (Maley 2020). In the United States, since 2017, nine state prisons have

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<sup>22</sup> <https://projectbleep.eu/>

<sup>23</sup> <https://prisonsystems.eu/projects/triangle/>

<sup>24</sup> The pilot is run in Berwyn and HMP Wayland.

adopted tablets for detainees, which were developed by Edovo and American Prison Data Systems with the purpose of offering educational, job training, and rehabilitative courses for imprisoned people (Mufarreh, Waitkus and Booker 2021).

The Ulmer Echo is a prisoner-written newsletter, also available online. Columnist Joe T urges the reader to see secure internet access in German prison as an opportunity rather than a risk. He underlines how internet access is desirable both in terms of reconnecting inmates with outside reintegration services and is part of the process of making equitable services available to citizens 'inside' and 'outside'. All new media takes time to process through the justice system, they note. Still, some Federal States (Mecklenburg-Vorpommern, Brandenburg, Berlin, and Lower Saxony, for example) have been quicker than others in translating the whitelisting of specific reintegration-related internet sites into practice and legislation.

*Figure 1: The different paces at which the German Federal States are taking up whitelisted internet access*

## Kiosks, Computers, Multimedia TV, and Tablets as self-service devices

Modern technologies such as videoconferencing capabilities, digital tablets, kiosks, and in-cell computers can be considered advancements over the traditional shared prison landline telephone and slow postal services. Personal digital gadgets help incarcerated persons participate in programs, study, and improve their digital literacy. They also provide new ways to preserve family relationships and possibilities to seek justice. The technologies discussed in this section may be used for change and rehabilitation and to assist inmates in transitioning to post-release life (McKay 2018c).

In terms of inmate technology use, some studies indicate that technology such as personal self-service kiosks or tablets for education and legal planning has aided in advancing rehabilitation goals and decreased recidivism (Kerr et al., 2018; McDougall et al., 2017). As Kerr and Willis (2018) describe, many prison systems worldwide (e.g., Canada, UK, U.S., Australia, Netherlands) allow incarcerated persons to access educational and legal materials via shared computers. Still, many prison systems prohibit or severely restrict internet access. In order to enable communication with allowed contacts, email service can be accessed in some jurisdictions frequently with a cost supported by imprisoned individuals (Kerr et al., 2018).

Tablets are currently the most common in-cell technology because of their inexpensive per-unit cost, low overhead, and simplicity of distribution.

National jurisdictions, States or individual prisons or jails collaborate with companies such as **Core**<sup>25</sup>, **eBO**<sup>26</sup>, **Telio**<sup>27</sup>, **Gerdes**<sup>28</sup>, **Unilink**<sup>29</sup>, **Tyler**<sup>30</sup>, **Edovo**<sup>31</sup>, **Aventiv**<sup>32</sup> (includes **Securus** and **JPay**), **ViaPath**<sup>33</sup> (formerly known as Global Tel-Link or GTL) or **Socrates**<sup>34</sup>, among others, to supply inmates with corrections-grade tablets preloaded with various services and content, including games, music, educational content, mental health and legal tools, commissary and online shopping, video-on-demand and secure messaging services. In most situations, tablets are pre-configured with a limited operating system that restricts access to the facility's secure local area network. Inmates are not permitted to access the public internet. The same services can be provided in any other technological device, such as a hall or mounted wall in-cell kiosk, a secure computer, or a secure multimedia tv.

King et al. (2017) demonstrated that psychometric evaluations, such as the Risk Need Perception Survey, might be successfully delivered using a tablet. In a randomised controlled trial, the authors examined the difference between incarcerated persons completing psychological exams on tablets and those using paper and pencil. Although the two methods were identical in content, King et al. (2017) discovered that inmates preferred to use the tablet and, as a result, developed a more constructive attitude toward the correctional institution after using the technology, as opposed to those who used the paper and pencil method. Continuing in the same line, we may state that a comparable response might be shown when technology is used to manage their own fundamental needs while incarcerated. This would be a helpful signal of how we might encourage incarcerated persons to learn new rehabilitation skills.

As a result, many governments recognise the rehabilitative benefits of limited internet connectivity for incarcerated people (Van De Steene and Knight 2017). Personal devices can be a good strategy in delivering programs related to violence, substance abuse, vocational training and facilitating connection to post-release housing, health, financial support, and employment services (Kerr et al., 2018). According to Reisdorf and Rikard (2018), successful rehabilitation models must incorporate reentry and digital inclusion strategies and include online and offline experiences. With this perspective, smart prisons can be viewed as less about incapacitating inmates and more about enabling them to acquire self-direction and responsibility in preparation for reentry into society.

For example, Lindstrom and Puolakka (2020) evaluated the Smart Prison Project in Finland, which included digital self-service gadgets. They asserted that these devices could be cost-effective for encouraging rehabilitation and lowering recidivism by increasing inmates' autonomy, agency, self-esteem, and life management skills. They found that the more self-

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<sup>25</sup> For more information, please visit [www.coresystems.biz](http://www.coresystems.biz)

<sup>26</sup> For more information, please visit [www.ebo-enterprises.com](http://www.ebo-enterprises.com)

<sup>27</sup> For more information, please visit [www.tel.io](http://www.tel.io)

<sup>28</sup> For more information, please visit [www.gerdes-ag.de](http://www.gerdes-ag.de)

<sup>29</sup> For more information, please visit [www.unilink.com](http://www.unilink.com)

<sup>30</sup> For more information, please visit [www.tylertech.com](http://www.tylertech.com)

<sup>31</sup> For more information, please visit [www.edovo.com](http://www.edovo.com)

<sup>32</sup> For more information, please visit [www.aventiv.com](http://www.aventiv.com)

<sup>33</sup> For more information, please visit [www.viapath.com](http://www.viapath.com)

<sup>34</sup> For more information, please visit [www.socrates-software.com](http://www.socrates-software.com)

sufficient and engaging digital self-services are, the more "invisible" prison walls can be made without compromising security (Lindstrom et al., 2020:18).

The deployment of PSS kiosks primarily in private prisons in England and Wales has similarly reduced inmate violations (McDougall et al., 2017). These kiosks (provided by Unilink) assist incarcerated persons in staying updated with technological advancements and enable them to perform various tasks, including ordering from the prison commissary, scheduling visits with those on the outside, and applying for education, rehabilitation programming, and healthcare appointments (McDougall et al., 2017). For example, a prisoner can order toiletries and minor things from the prison shop by simply selecting from a list on a kiosk. The cost of the purchases is then automatically deducted from the prisoner's private account, and a receipt is sent before the products are delivered.

McDougall et al. (2017) also notice a statistically significant reduction in recidivism for individuals who use technology within the first year of release, demonstrating the benefits of adopting PSS kiosks. The authors hypothesise that PSS kiosks in prison will aid in rehabilitating imprisoned individuals by allowing them to gain familiarity with digital technology, function independently of correction officers, and choose how to spend their time (McDougall et al., 2017).

Donned as a "world-leading [solution] in terms of providing a single and consolidated platform for delivering bespoke prison services to inmates" (Van de Steene and Knight 2017, 2), **PRISONCLOUD** was implemented by Belgian prison authorities in 2016. Through this project, inmates at the Beveren Prison in Antwerp had limited and controlled access to online services and Internet (Gilna 2017, 18). PrisonCloud gives inmates access to games, books, legal materials, and their criminal case files without having to involve the staff. This solved the problem of prison staff organising inmates' movements (Robberechts and Beyens 2020, 286; 2017). According to an article published by Prison Legal News, "each prisoner receives a USB drive plus a username and password; their cells contain a monitor, keyboard, mouse, headset and equipment to connect them to a server" (Gilna 2017). Through PrisonCloud, inmates can have access, in exchange for money, to secure email, phone calls, and adult movies.

After its success at Beveren Prison in Antwerp, PrisonCloud has been implemented into two newly built prison facilities in Belgium. Despite its merits, in 2022, a new self-service multimedia solution has been selected to be implemented in the remaining prisons in Belgium.

*Figure 4 Example of existing practice in digitalisation of prisons*

In Germany, it was recently decided to grant all 4024 detainees in Berlin's penal system internet access via tablets. This decision was based on the successful completion of the field phase of a unique project conducted in the Berlin correctional system, titled "Resocialisation through Digitalisation" (Bode 2019). Seventy-two inmates of the prison in Heidering were specially selected as test persons in this project. They were, starting in June 2018, furnished with internet-enabled tablet computers that they were allowed to use on an everyday basis. The decision made by Berlin's Justice Senator, who, as the minister of justice, is in charge of the prison system, to broaden the project to include all inmates in the federal state's

penitentiaries is a far-reaching consequence of the digital modernisation of the German prison landscape.

However, the decision was not only met with approval. Its critics observe that backwardness in digital matters is by no means a problem specific to the prison population but that a lagging digital development can also be found in other segments of society. Another objection is that internet usage by inmates makes special precautions necessary, which leads to considerable expenses for the penal facilities, so economic considerations come to bear on this issue. Notwithstanding these objections, it is, already on constitutional grounds, undeniable that the digital transformation and its concomitant use of digital media must be given room, and even have to be promoted, in the correctional system as well. Bode's study (2019) specifies the legal implications of the thought that penitentiary law has to comply with constitutional principles to advocate for more courageous decisions to overcome the very restrictive status quo of internet usage in prisons. Finally, the solution adopted will include using in-cell secure multimedia TVs that allow inmates to access the same services as they would on a tablet device.

In conclusion, some technologies have the potential to benefit incarcerated persons by connecting them to the outside world in a safer and more rehabilitative environment. These technologies may provide positive opportunities to access justice, maintain family relationships, and participate in programs that optimise their post-release circumstances, thereby facilitating rehabilitation and reducing recidivism. Introducing personal digital devices in prisons may normalise technology and ensure that inmates are not digitally excluded upon release.

## Virtual Reality

The benefits of using **VIRTUAL REALITY** for learning and behavioural change are well studied and show encouraging results. In Europe, several research initiatives have been developed to explore the use of V.R. in educational and therapeutical contexts in prison.

A recent study by Smith et al. (2022) reports on the feasibility and initial effectiveness of Virtual Reality Job Interview Training within two prisons. VR-JIT was deemed by detainees as highly acceptable and usable and had significant improvements in interview skills, interview training motivation, interview anxiety, as well as greater employment by 6-month follow-up. This was the only study to mention virtual reality technologies in prison. Another use of virtual reality in prison is reported in New Zealand. It is aimed at assisting inmates with dyslexia and other learning difficulties to improve their basic literacy and numeracy skills (Prison Learning Alliance 2020, 8).

For example, it is important to refer to some E.U.-funded projects, such as the **VR4DrugRehab**<sup>35</sup> project, aiming to develop and test an innovative drug treatment programme using advanced Virtual Reality (VR technology in a young offender population

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<sup>35</sup> <http://www.vr4drugrehab.org/>

under probation supervision; the **VIRTI**<sup>36</sup> project, aiming to use virtual reality technologies by creating virtual environments, compensating for the scarcity of resources (such as training laboratories, materials and tools) in prison facilities; the **VISION**<sup>37</sup> project, seeking to develop the inmates' competencies through VR based Vocational Education and Training programmes; or the **TRAIVR**<sup>38</sup> project, aiming to provide rehabilitation through a VR training programme based for refugee probationers with drug addiction problems.

## Videoconferencing in/with courts

In recent years, videoconferencing technology has become increasingly common in justice systems used to carry out administrative and civil procedures and pre-trial release hearings and sentences (virtual court hearings). In pre-trial hearings (custody hearings) or ongoing cases involving persons deprived of their liberty, virtual court hearings have the potential to reduce the security risks associated with prisoner transfer, reduce the costs associated with transporting from prison to the criminal court and return; allow greater access to justice through a hearing, helping to alleviate overcrowding and the number of pre-trial prisoners who do not pose a threat to public safety; and provide a useful tool for rural jurisdictions that would otherwise have difficulty meeting legal deadlines for holding custody hearings (Davies and Matelevich-Hoang, 2015).

**VIDEOCONFERENCING IN COURTS** (VC is one of the measures proposed by the 2019-2023 action plan European e-Justice.<sup>39</sup> VC facilitates distance hearings, reduces the costs associated with criminal proceedings (Graur 2020), enhances security, and speeds up proceedings (Devaux 2017; 2018) and is used in many jurisdictions for cross-border proceedings.<sup>40</sup> VC allows children to testify without seeing the offender (Ali and Al-Junaid 2019). In a comparison of penology in Jordan, the United Arab Emirates, and France, Shiyaba *et al.* (2020) don VC as one of the most effective and advanced means for conducting remote trials and protecting defendants, witnesses, and victims.

For these purposes, courts instituted different types of VC throughout time. **AUDIO-VISUAL LINKS** for select court participants have been a customary court practice for decades (Rossner 2021). However, this form of technologically mediated proceedings has been criticised for isolating the prisoner, thus resulting in the "literal expulsion from the courtroom, with an appearance from the courtroom, with an appearance from behind prison walls" (McKay 2018). VC systems were introduced in the late 1990s, with the U.K. being one of the first countries to use VC for pre-trial court hearings (Devaux 2017). For courts to conduct hearings remotely, courts and prisons should be equipped with cameras, screens, microphones, and loudspeakers (*idem*).

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<sup>36</sup> <https://prisonsystems.eu/projects/virti/>

<sup>37</sup> <https://prisonsystems.eu/projects/vision/>

<sup>38</sup> <https://prisonsystems.eu/projects/traivr/>

<sup>39</sup> The plan can be found at [https://eurlex.europa.eu/legalcontent/EN/TXT/PDF/?uri=CELEX:52019XG0313\(02\)&rid=6](https://eurlex.europa.eu/legalcontent/EN/TXT/PDF/?uri=CELEX:52019XG0313(02)&rid=6).

<sup>40</sup> Braun, Davitti, and Dicerto (2018) discuss the results of the European project AVIDICUS 3 and state that VC for cross-border proceedings is used in the 12 jurisdictions involved in project (Belgium, Croatia, England and Wales, Finland, France, Hungary, Italy, the Netherlands, Poland, Scotland, Spain, and Sweden). Except for Croatia and Hungary, all countries in the project use VC for national proceedings as well.

Videoconferencing is recommended in the literature as an exercise of the right to be present in court and the exercise of the right to be heard. Gori and Pahladsingh (2021) discuss videoconferencing in court proceedings in the context of the Covid-19-related suspension of all pending ordinary proceedings from March until May 2020. In this context, videoconferencing is proposed as an effective part of the ordinary activity of courts. The article departs from Italian case studies but considers other vignettes, especially from the Netherlands. In the wake of Covid-19-imposed restrictions, the Dutch judiciary urgently implemented VC in criminal courts (Vanderveen 2022). Vanderveen (2022) reports on the findings of a survey of Dutch lawyers conducted in September 2020 and argues that respondents were concerned about technical issues and malfunctioning equipment. Moreover, the study expresses concern in relation to the rights of suspects, citing a study commissioned by the Research and Documentation Centre: "in order to guarantee the rights of a suspect, improvements need to be made with respect to technology, equipment, connection, the layout of the suspect's location (in prison), protocols, and training of personnel" (*idem*, p.1).

Some studies discuss the feasibility of VC in court settings but only concerning monolingual court settings (Devaux 2017; 2018; Braun, Davitti and Dicerto 2018). They argue that in multilingual court settings, where an interpreter is needed, videoconference system interpreting raises issues related to its legality, as it infringes on the defendant's right to due process. Other issues revolve around participants' perceptions of the court hearing, interaction, and technological issues (Devaux 2018). Reporting on the European AVIDICUS 3<sup>41</sup> project findings, Braun, Davitti and Dicerto (2018) discuss the role of interpreters in VC-mediated court proceedings, arguing that interpreters have a lesser role as technology is not designed to consider all stakeholders (especially interpreters).

Resources and user stories compiled by Professor Richard Susskind on the use of videoconferencing in courts worldwide can be accessed at the website "Remote Courts Worldwide" ([www.remotecourts.org](http://www.remotecourts.org)).

Videoconference is the measure proposed by the EU e-Justice plan regarding e-communication in the field of justice. In order to **secure communication between citizens, practitioners and judicial authorities**, in order to more immediately involve citizens in electronic judicial proceedings, tools for direct communication between citizens, practitioners and judicial authorities need to be developed.

European  
Union  
e-Justice

## Telemedicine

Telemedicine, also known as telehealth, has been used for over four decades in different specialities, such as radiology, psychiatry, and emergency medicine. In the correctional setting, where many inmates have complex medical needs and accessing an external

<sup>41</sup> The project examines video-mediated interpreting in 12 European jurisdictions (Belgium, Croatia, England and Wales, Finland, France, Hungary, Italy, the Netherlands, Poland, Scotland, Spain, and Sweden).

physician can be time-consuming, many prison administrations started to think outside the box about providing specialised health care more quickly, even when technology is not at the forefront of innovation. Thus, telemedicine in the correctional setting greatly simplifies the medical care provided for the inmates. Also, rather than dealing with long periods of travel and extensive safety measures to care for patients, doctors may now offer specialised health care by videoconferencing or reviewing high-quality x-ray images and photos (Tenforde et al. 2017).

Because telemedicine is well established in countries where a significant distance separates the patients from doctors, most evidence-based results are from countries such as the United States (Alverson et al., 2019) or Australia (Tian et al., 2021). In Europe, telemedicine is still used on a small scale without being integrated into the general health systems (Gualano et al., 2017, Edge et al., 2020). However, the coronavirus lockdown meant healthcare services have suddenly increased their use of video communications through various platforms (Zoom, Skype, FaceTime, WhatsApp) to enable access to healthcare services.

In a recent systematic review, Edge et al. (2019) investigated the factors influencing the successful implementation of prison telemedicine, identifying the importance of a comprehensive implementation strategy that includes stakeholder buy-in, recognition of contextual enablers and barriers, and balancing anticipated benefits with adequate resourcing.

According to the literature, telemedicine in prisons is most frequently used in mental health (Senanayake et al., 2018). The acceptance of telepsychiatry may vary according to different patients' needs and underlying mental conditions. One analysis discovered minimal indication of difficulty conducting telehealth consultations with patients who have psychosis, citing two clinical trials demonstrating the effectiveness and acceptability of such assessments in this population (Kruse et al., 2018). Additionally, those with intellectual disabilities and educational deficits may require special consideration (Kruse et al., 2017).

The type of telehealth services chosen in a correctional setting is determined by: population demands, provider availability, and service feasibility (Tian et al. (2021). Following service selection, criminal justice officials must consider the impact of telehealth on their institutions. Roles and duties, scheduling and workflow, assessment methodologies, technical infrastructure, and physical space and security are all reviewed items. Finding a sufficiently private and secured area with connectivity within a facility may be challenging, and this must be factored into deployment planning.

Additionally, coordination and information exchange between the location of the patient and the location of the provider must be considered. Legal and regulatory factors, such as changing legislation governing electronic consent, security, and provider types permitted to supply services, must also be watched (Kruse et al., 2018).

Staff duties and responsibilities will change due to telehealth implementation, and these changes may differ depending on the facility's security. Thus, executives must take an active, hands-on role in telehealth deployment to infuse support and engagement across the enterprise (Kruse et al., 2018). As with any change, addressing staff members' viewpoints

before, during, and after telehealth adoption can help ensure its success. Identifying advocates and boosting education and awareness are two factors that will increase the likelihood of effective implementation (Sales et al., 2018).

Numerous individuals may be scared by technology or may be unfamiliar with dealing with providers via technology. It is critical to evaluate the population's experience with technology and access to devices like tablets (both within facilities and upon reentry) to determine their suitability for telehealth (Kruse et al., 2018).

People who are more knowledgeable about health care are more likely to embrace telehealth (Kruse et al., 2017; 2018) than those with a lesser level of health literacy (Paige et al., 2017). Additionally, it is critical to prepare individuals and identify post-release telehealth needs, such as the need for a private location, a device, and internet or cellular access. When people understand the benefits of telehealth and how it might assist them, they will be more encouraged to use it and experience improved outcomes even after they are released from prison (Tian et al., 2021).

Telehealth costs and benefits vary according to the type of service picked or the institution and can potentially impact the physical infrastructure, the technical infrastructure, and the workflow (Kruse et al., 2018). Regardless of the financing source, it is critical to quantify the costs and advantages of telehealth (e.g. improved outcomes, cost savings, and cost avoidance). In a study comparing the cost of face-to-face treatment and telehealth treatment of hepatitis C in a Spanish prison, Cuadrado et al. (2021) concluded that telemedicine reduces the cost by 30.3% per patient, primarily because transfer costs may be reduced while maintaining efficacy and satisfaction.

The COVID-19 pandemic has shown the significance of telemedicine in the fight against diseases by providing critical assistance to those incarcerated and reentering society. Another benefit of telemedicine is combating infectious diseases in prisons (Morey et al., 2019). Telehealth can be used in various ways, including assisting with peer counselling, increasing access to speciality treatments, and assisting with transitions upon reentry.

In conclusion, many studies have demonstrated that inmates' access to telemedicine generally improves their care, whether for the diagnosis of diseases that require specialised intervention or for problems common to prison populations, such as HIV (Young et al., 2014 and 2017) and hepatitis (Cuadrado et al., 2021, Halder et al., 2021). Along with expanding access to health care, telemedicine lowers travel costs and custody costs in an outpatient hospital setting (Cuadrado et al., 2021) and the safety risks associated with it (Edge et al., 2019).

## Electronic monitoring and telephone supervision

Electronic monitoring uses radio-frequency technology (low-risk to moderate-risk offenders), GPS technology (high-risk offenders) and biometric technologies (remote alcohol monitoring, for example). According to Bartels and Martinovic (2017), more than 30 countries adopted one form of electronic monitoring as an alternative to pre-trial detention, community sentence, condition to bail or early release from prison, and different types of offences. More

recently, as a replacement for GPS bracelets, several jurisdictions (USA and Turkey, as examples) have adopted smartphones with GPS to monitor low-risk offenders<sup>42</sup>.

Recent studies indicate that EM may successfully reduce recidivism rates (Wolff et al., 2017). A 2017 update to the meta-analysis confirms some of these findings; overall, using EM did not result in statistically significant decreases in reoffending rates. Nonetheless, specific categories of criminals, such as sex offenders, benefited from the program as an alternative to prison and as part of certain conditions of release (Belur et al., 2017). The authors of the meta-analysis make an excellent point about the difficulty of assessing the performance of EM programs because jurisdictions have various definitions of successful utilisation of the technology (Belur et al., 2017).

In a randomised control study in Germany (Schwedler et al., 2017), the authors compared incarcerated persons' psychosocial and psychological characteristics that received early release preparation electronically monitored and those who did not. The results indicated that those subjected to electronic monitoring upon release were more likely to report a rehabilitative experience. They were more likely to exhibit law-abiding characteristics, make lifestyle changes, and benefit from enhanced feelings of emotional stability, independence, and autonomy. They gained from better rehabilitation, but they were also less likely to engage in deviant behaviour and more likely to internalise law-abiding behaviour.

Remote supervision is frequently used to supervise low-risk offenders who do not require rigorous supervision (Phillips, 2017). Typically, remote supervision entails using a fixed or mobile device that enables service users to access information, get updates, and communicate with their designated officer. In the United States of America, examples include kiosk machines that enable service users to check in with probation officials by scanning their hands or finger. These computers can generate appointment dates, perform other activities such as reporting and uploading data and participate in traditional face-to-face meetings (McGreevy, 2017).

According to evidence, adapting rehabilitative support to an individual's requirements has the potential to improve supervision practice by facilitating interaction and discussion (Morris et al., 2018). Displaying information interactively and animatedly may be beneficial when attempting to build rapport and elicit positive responses, particularly from those with learning disabilities or impaired understanding abilities (Morris et al., 2018).

## The "smart prisons" programmes

The term "smart prison" is used more frequently in prisons that incorporate **ARTIFICIAL INTELLIGENCE** technologies (AI and information and communication technologies (ICT) into their infrastructure. Through these types of technologies, the work of prison officers and administrators can be better organised; AI can help to have smart surveillance, facial recognition, and analytics, can assist incarcerated people with their reintegration into society and, according to Knight and Van De Steene (2017), providing a humane environment for

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<sup>42</sup> The EM system generates a random videocall to a probationer who needs to reply to the call or take a photo that is sent back to the system. Video, photo or voice authentication and compliance with supervision rules are automatically confirmed by the system.

inmates. Some elements of smart prisons have been implemented in different countries, such as Australia (Goedbloed, 2019), China (Chen, 2019), Finland (Lindstrom et al., 2020), Hong Kong (Leung, 2019), Singapore (Paulo et al., 2019). For example, Malaysia increasingly relies on artificial intelligence (AI analyses CCTV footage to anticipate fights or flight attempts (Goedbloed, 2019). Australia is currently conducting pilot programmes of various artificial intelligence technologies that combine CCTV analysis and smart sensors in the probation and home detention contexts (Goedbloed, 2019). Hong Kong, for example, is a leader in smart prisons, providing FitBits to inmates to track their activities and pulse to prevent overdoses or fights (Leung, 2019). The National Institute of Justice in the U.S. has Commissioned several research projects on the extensive use of AI in corrections, including on the use of algorithms that may predict criminal recidivism<sup>43</sup>.

In order to create a safer prison environment and mitigate the risk of violence, particularly between correctional personnel and the inmates, smart prisons are equipped with automated, artificial intelligence-based or robotic monitoring and surveillance that reduce the need for prison staff to interact physically with incarcerated persons. An example of how it can be applied in practice is the trial programme developed in Hong Kong (Leung 2019), where **ROBOT GUARDS** equipped with three-dimensional cameras, sensors, and recognition algorithms patrol the prison autonomously under the supervision of a remote correctional officer. The aim is to have an intelligent hyper-security and surveillance system by adding to the robot guards increased closed-circuit television cameras, facial recognition technology, video analytics, and tracking bracelets (Leung 2019). China's smart prison (Yancheng Prison) enables the surveillance of inmates via a network of sensors and cameras coupled with an artificial intelligence technology that can follow and monitor each inmate in real-time (Chen, 2019).

In Singapore, the Singapore Prison Service (SPS) is developing a model of prison without guards to generate operational efficiency by using fewer prison staff (Yusof, 2018; Ganesan, 2018). In this programme, some critical technologies have been piloted or implemented (Khair, 2018; Ganesan, 2018). The first technology is **AVATAR**, a human behaviour detection system for aggressive behaviours and **VADAR** to detect and warn prison staff about irregular actions. They also have **FACIAL RECOGNITION** cameras installed in cells to facilitate automatic inspections and scannable wrist bracelets equipped with communication chips that enable the incarcerated people to make cashless purchases at vending machines. The bracelets are also connected to the digital rehabilitation records management system used to track and gather statistics on inmates' attendance at rehabilitation programs. The incarcerated people are offered tablets, and apps for study and communication, thereby eliminating the need for hardcopy materials and reducing contraband. In addition, kiosks are available so inmates can perform different self-service administrative activities.

During the pandemic, Turkey deployed integrated digital solutions to support educational programmes and inmates' contact with their families in the country's prisons. The 7.049 devices were implemented in 143 prisons, benefiting 145.967inmates and 235.776 relatives.

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<sup>43</sup> For more info see here <https://nij.ojp.gov/topics/articles/results-national-institute-justice-recidivism-forecasting-challenge#papers-from-the-winners>

More than 22 million transactions (phone calls and video calls) were realised during that period.

In the Netherlands, as part of an integrated security management system programme, **RADIO-FREQUENCY IDENTIFICATION (RFID)** bracelets have been introduced. This system automates prison doors, monitors inmates' movements and locations, and has an automated emotion recognition software that monitors conversations and conflicts (Northfield, 2018). RFID technology identifies and tracks inmates and their compliance with their daily schedules via a chip inserted in a tamper-resistant bracelet or anklet, controls the perimeter and the exclusion zones and provides evidence of misconduct; that way, the prison staff can allow more time for high-level rehabilitation work (Yusof, 2018). According to Leighton (2014), this technology allowed inmates to move freely under intense observation and increased autonomy and self-discipline. However, in terms of avoiding violence, a study conducted in the United States by Halberstadt and La Vigne (2011) discovered that RFID was inefficient at deterring prisoner misconduct, particularly sexual violence.

Despite its advantages, the use of Artificial Intelligence technologies by Criminal Justice Systems is under scrutiny throughout the world. Civil Rights movements and criminal justice watchdogs such as Fair Trials International<sup>44</sup> have advocated for the ban of AA.I. in police, courts, and prisons,<sup>45</sup> alerting to the risks of discrimination and bias, the infringement of the presumption of innocence and the lack of transparency and routes for redress.

Since 2018, the Council of Europe<sup>46</sup>, the European Parliament<sup>47</sup>, the European Council and the European Commission<sup>48</sup> are taking serious steps toward regulating the use of AI algorithms in Criminal Justice.

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<sup>44</sup> About Fair Trials International: [www.fairtrials.org](http://www.fairtrials.org)

<sup>45</sup> See here: <https://www.fairtrials.org/campaigns/ai-algorithms-data/>

<sup>46</sup> "European ethical Charter on the use of Artificial Intelligence in judicial systems and their Environment". Available here: <https://rm.coe.int/ethical-charter-en-for-publication-4-december-2018/16808f699c>

<sup>47</sup> "European Parliament resolution with recommendations to the Commission on a framework of ethical aspects of artificial intelligence, robotics and related technologies (2020/2012(INL))". Available here: [https://www.europarl.europa.eu/doceo/document/TA-9-2020-0275\\_EN.html](https://www.europarl.europa.eu/doceo/document/TA-9-2020-0275_EN.html)

"European Parliament resolution of 20 October 2020 with recommendations to the Commission on a civil liability regime for artificial intelligence (2020/2014(INL))". Available here [https://www.europarl.europa.eu/doceo/document/TA-9-2020-0276\\_EN.html](https://www.europarl.europa.eu/doceo/document/TA-9-2020-0276_EN.html)

and the "European Parliament resolution of 20 January 2021 on artificial intelligence: questions of interpretation and application of international law in so far as the EU is affected in the areas of civil and military uses and of state authority outside the scope of criminal justice (2020/2013(INI))". Available here: [https://www.europarl.europa.eu/doceo/document/TA-9-2021-0009\\_EN.html](https://www.europarl.europa.eu/doceo/document/TA-9-2021-0009_EN.html)

<sup>48</sup> "Coordinated Plan on Artificial Intelligence, 2021 Review - AI act": <https://digital-strategy.ec.europa.eu/en/library/coordinated-plan-artificial-intelligence-2021-review>

## Conclusion

"A digital revolution is upon our penal system," an article by Van de Steene and Knight (2017) prophetically announces. Although digital technologies have profoundly impacted the justice field, it has experienced less visible technological developments. The restrictions imposed by the Covid-19 outbreak have expedited the digitalisation process, especially in prisoner telecommunication technologies. Moreover, most jurisdictions across Europe have implemented videoconferencing with courts as an exercise of the rights of being present and being heard. This review considers the availability and uptake of technological advancements, primarily digital, in corrections.

In the field of prisoner telecommunication technologies, wing-based telephones have started to be replaced by in-cell phones for the purposes of securing intimacy for inmates. Telephones, along with email and online visitation, have emerged in the wake of Covid-19 as necessary developments for people in prison. Many authors included in this review take into consideration the high costs these types of communication invite for inmates and their families but recommend a mode of widespread implementation of digital communication as a way of reducing the incidence of contraband and illicit goods smuggled into the prison. Videoconferencing with courts is one of the measures proposed by the 2019-2023 European e-Justice action plan and is seen as a way of facilitating distance hearings, speeding up proceedings, and reducing the costs of criminal trials.

The Covid-19 lockdown has interrupted the flow of face-to-face education in prisons as well, articulating the need for ICT in correctional education as a necessity. Using ICT in correctional education is part of a larger framework of "digital rehabilitation" aimed at using technology as part of the reentry process by supporting communication with family, learning, and entertainment. Virtual Campus, blended learning and access to laptops in cells are a few of the forms of e-learning developed in prison. Virtual reality appears as a positive development in the field of job training and assisting inmates with cognitive impairments.

Most studies in this review regard telemedicine as democratising inmates' access to healthcare services, lowering the costs and safety risks associated with travel and custody in outpatient hospital settings. As mentioned throughout this paper, Covid-19 popularised telehealth, including for people with lower levels of health literacy, and authors argue that the implementation of telehealth post-Covid is one of the changes that will remain in the aftermath of the virus.

In terms of inmate technology use, some studies indicate that technology such as self-service kiosks or tablets for education and legal planning has aided in advancing rehabilitation goals and decreased recidivism. Tablets are the most common in-cell technology because of their inexpensive per-unit cost, low overhead, and simplicity of distribution. Moreover, many of the studies included in this review argue that recidivism is statistically significantly reduced for individuals who use technology within the first year of release, demonstrating the benefits of adopting PSS kiosks.

Electronic monitoring uses radio-frequency technology, GPS technology and biometric technologies. More than 30 countries adopted one form of electronic monitoring as an

alternative to pre-trial detention, community sentence, condition to bail or early release from prison, and different types of offences. The implementation of EM has mixed reviews. Some authors do not see statistically significant decreases in reoffending rates. In contrast, others contend that those subjected to electronic monitoring upon release were more likely to report a rehabilitative experience.

And finally, "smart prison" programmes, that is, prisons that have implemented artificial intelligence technologies and ICT into their infrastructure, are described as having the potential to be more humane and better-organised approaches to corrections (Knight and Van De Steene, 2017). Nevertheless, the task of digitising and smartizing prisons is a moving target – that is, a promising yet challenging process which aims to bring about positive social and psychological effects for both prisoners and staff, raising, at the same time, serious ethical issues on the use of artificial intelligence in corrections. Despite its advantages, the use of Artificial Intelligence technologies by Criminal Justice Systems is under heavy scrutiny throughout the world. Civil Rights movements and criminal justice watchdogs are alert to the risks of discrimination and bias, the infringement of the presumption of innocence and the lack of transparency and routes for redress. Since 2018, the Council of Europe, the European Parliament, the European Council, and the European Commission have been taking serious steps toward regulating the use of AI algorithms in Criminal Justice.

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# DIGICOR

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