GLOBAL INFORMATION SOCIETY WATCH 2021-2022

Digital futures for a post-pandemic world

Association for Progressive Communications (APC)
and Swedish International Development Cooperation Agency (Sida)

Global Information Society Watch 2021-2022
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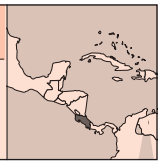
COSTA RICA

ROBOTICS AND AI DURING THE PANDEMIC: THE FUTURE OF AUTOMATED JOBS IN COSTA RICA



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Introduction

Many countries are turning into highly technology-driven and digitised societies due to the COVID-19 pandemic. While Costa Rica is no exception, it raises the issue of how robots and artificial intelligence (AI) are being used in a way that will impact on the future of work.

This shift to automated processes and autonomous systems is being experienced more and more in our daily lives. Intelligent systems are making decisions for us and shaping the way society interacts with and perceives technology.

Although there have been various debates recently on violations of digital rights, many in civil society are still concerned about the lack of recognition of certain fundamental rights nationally, and also in the regional human rights tribunal. Moreover, the shift to a future of automated and autonomous systems also affects how digital rights advocacy should act, and the issues that should be considered important. In this sense, these new challenges require collective action, including the development and revision of public policy and laws, and the strengthening of institutions.

From tourism and agriculture to a future built on automation and autonomous systems

Costa Rica is a country located in Central America that bases its economic activities mainly on tourism, agriculture (coffee, pineapples and bananas) and some industrial activity that includes the manufacturing of computer chips.[1] It is a country with just over five million people,[2] with one of the highest levels of internet coverage in Latin America.[3]

Costa Rica is still considered one of the most solid democracies in the Americas.[4] In the 1990s it was even recognised as one of the most just and equal countries, with one with the highest levels of human development globally.[5] Nevertheless, over the years, concerns have been raised over the country's steady increase in socioeconomic inequalities. By 2018 Costa Rica was considered the eighth most unequal country in the region – and by 2020, due to the COVID-19 pandemic, this inequality had worsened.[6]

The internet has played a fundamental role in activities such as remote work and education, but it is not the only technology used during these difficult times: the use of automation as well as AI has also been growing around the world.[7]

One definition of automation – written in the middle of the 20th century – defines it as the "mechanical combination of numerous operations while adding controls in order to automatically generate a product."[8] Since then the use of the term "output" has been preferred over "product", but it is nevertheless important to establish that unlike AI, automation does not imply "intelligence", but is about executing an operation automatically.[9]

Costa Rica's first signs of automation impacting on the kinds of work available for people could be seen in simple ways such as the progressive automation of the job of a security guard in a parking lot. Nowadays, in many shopping centres, machines and booms control the entry and exit of cars from parking lots and no human operator is required to do this.

1 Rodríguez, Ó. (2021, 22 July). Demanda global de 'chips' impulsa a Intel a doblar su apuesta por Costa Rica. *El Economista*. https://www.eleconomista.net/tendencias/Demanda-global-de-chips-impulsa-a-Intel-a-doblar-su-apuesta-por-Costa-Rica-20210722-0020.html

2 https://datos.bancomundial.org/indicator/SP.POP.TOTL?end=2020&locations=CR&start=2020

3 Rojas, E., Poveda, L., & Grimblatt, N. (2016). *Estado de la banda ancha en América Latina y el Caribe 2016*. CEPAL. https://www.cepal.org/es/publicaciones/40528-estado-la-banda-ancha-america-latina-caribe-2016

4 OEA. (2022, 8 February). *Misión de la OEA saluda al pueblo costarricense tras la exitosa jornada electoral del 6 de febrero*. https://www.oas.org/es/centro_noticias/comunicado_prensa.asp?sCodigo=C-005%2F22

5 Programa de las Naciones Unidas para el Desarrollo. (1991). *Desarrollo Humano Informe 1991*. https://hdr.undp.org/sites/default/files/hdr_1991_es_completo_nostats.pdf

6 Muñoz, D. (2022, 23 February). Costa Rica avanza sin freno hacia una sociedad cada vez más desigual. *Semanario Universidad*. https://semanariouniversidad.com/pais/costa-rica-avanza-sin-freno-hacia-una-sociedad-cada-vez-mas-desigual

7 Chamola, V., Hassija, V., Gupta, V., & Guizani, M. (2020). A Comprehensive Review of the COVID-19 Pandemic and the Role of IoT, Drones, AI, Blockchain, and 5G in Managing Its Impact. *IEEE Access, 8*, 90225-90265. https://ieeexplore.ieee.org/stamp/stamp.jsp?tp=&arnumber=9086010

8 Harrington, D. F. (1958). Automation's Impact on Industrial Safety. *Cleveland State Law Review, 7*(2).

9 Defense Science Board. (2016). *Summer Study on Autonomy.* Office of the Under Secretary of Defense for Acquisition, Technology and Logistics. https://www.hsdl.org/?view&did=794641

Automation eventually expanded into our notion of "autonomous systems". Different to the phenomenon of automation, an autonomous system does not just work with minimum or no human intervention, but also possess what we might call cognitive capacities, such as "intelligence" through the use of AI, and an "orientation" towards a goal, that are essential to the autonomy of the system.[10]

But what makes AI-driven technology different from other technologies that could put human rights at risk? AI has some features that more traditional technologies do not. There is, for example, its level of autonomy, requiring less and less human intervention. It can be unpredictable, because it is uncertain what action a machine collecting and processing data will take. Finally, there is a lack of transparency, as a person cannot clearly know why a specific decision or action was taken.

During the COVID-19 pandemic, countries such as China used autonomous systems extensively in the form of AI to detect possible new infections, and robots for medical care and for disinfection.[11] As discussed below, similar developments have been seen in Costa Rica.

According to the Inter-American Development Bank, 68% of jobs in Costa Rica could be replaced by robots.[12] Robotics is considered the most important trend within the life science and manufacturing sectors in Costa Rica, and 64% of companies in the country say that they will adopt robotics processes in their enterprises.[13] The country has the potential to grow this field even more. By 2019, the number of graduated professionals on mechanical and electrical engineering rose to 700.[14]

The rise of autonomous systems during the pandemic

Different to highly automated countries such as Japan, Germany and China,[15] Costa Rica does not have a solid foundation of using robots or AI as workers. However, Costa Rica is deploying the technologies rapidly, mainly motivated by the critical necessities brought on by the coronavirus. Therefore, the ways Costa Rica has been introducing automation and autonomous systems in the context of COVID-19, how this has impacted current employment opportunities and will impact the future of work, how this will introduce inequalities, and the role of digital rights and civil society advocacy in this context are critical questions.

In light of the many deaths of health care personnel due to COVID-19 and their huge risk of exposure to the virus on a daily basis,[16] one of the first measures implemented in Costa Rica was telemedicine in various forms.[17] For instance, it was used in the country for several applications: advising on medical procedures, collecting medical data, and even remote medical examinations.[18] Robots were also used for disinfecting hospitals,[19] as well as for security.[20]

Robots play increasingly more decisive roles in society, including when the cognitive capacities of autonomous systems are put to work in critical moments of health care in which lives are at stake. Last year, Costa Rica became the first Central American country using a robot to guide doctors in a knee-replacement operation.[21] The doctors said that in highly complex surgeries such as this, the robot was able to work with more precision, resulting in a quicker recovery for the patient.[22] The use of AI in health care, as suggested, is already taking place. There are algorithms that interpret data through sensors and produce health diaries for patients in Costa Rica,[23] with doctors notified about changes in the data.[24] There is also a robot that prepares

10 Roff, H. M. (2019). Artificial Intelligence: Power to the People. *Ethics & International Affairs, 33*(2), 127-140. https://doi.org/10.1017/S0892679419000121

11 Toh, M., & Wang, S. (2020, 24 February). Drones. Disinfecting robots. Supercomputers. The coronavirus outbreak is a test for China's tech industry. *CNN*. https://edition.cnn.com/2020/02/23/tech/china-tech-coronavirus-outbreak/index.html.

12 Ripani, L., Kugler, A., Kugler, M., Soler, N., & Rodrigo, R. (2020). *El Futuro del Trabajo en América Latina y el Caribe: ¿ Cuál es el impacto de la automatización en el empleo y los salarios?, p. 13*. Banco Interamericano de Desarrollo. https://doi.org/10.18235/0002960

13 https://www.cinde.org/es/tecnologias/robotica#hero

14 Ibid.

15 International Federation of Robotics. (2021, 27 January). Robot Race: The World's Top 10 automated countries. https://ifr.org/ifr-press-releases/news/robot-race-the-worlds-top-10-automated-countries

16 ElPais.cr. (2020, 23 October). Costa Rica reporta 13 fallecimientos por Covid-19 entre personal médico de la CCSS. *ElPais.cr*. https://www.elpais.cr/2020/10/23/costa-rica-reporta-13-fallecimientos-por-covid-19-entre-personal-medico-de-la-ccss

17 CAF et al. (2020). *Las oportunidades de la digitalización en América Latina frente al COVID-19*. CAF & United Nations. https://repositorio.cepal.org/bitstream/handle/11362/45360/4/OportDigitalizaCovid-19_es.pdf

18 PAHO. (2020). *Asegurando la continuidad del tratamiento de pacientes crónicos en tiempos de pandemia: Telesalud en Costa Rica*. https://www.paho.org/es/historias/asegurando-continuidad-tratamiento-pacientes-cronicos-tiempos-pandemia-telesalud-costa

19 Rodríguez, I. (2021, 12 February). Llega a Costa Rica robot que promete 'destruir' virus causante de covid-19. *La Nación*. https://www.nacion.com/ciencia/salud/llega-a-costa-rica-robot-que-promete-destruir/N2ECJVF67NADTN46TVGVXF42QQ/story

20 Ibid.

21 de la Cruz, A. (2021, 18 June). Robot asiste a ortopedistas en cirugía de reemplazo de rodilla. *CCSS Noticias*. https://www.ccss.sa.cr/noticias/salud_noticia?robot-asiste-a-ortopedistas-en-cirugia-de-reemplazo-de-rodilla

22 Jerez, M. (2021, 18 June). Robot guía a médicos en cirugía de rodilla: CCSS es pionera en Centroamérica. *AM Prensa*. https://amprensa.com/2021/06/video-robot-guia-a-medicos-en-cirugia-de-rodilla-ccss-es-pionera-en-centroamerica

23 https://www.cinde.org/es/tecnologias/ia-machine-learning

24 Ibid.

your medical prescriptions in less than one minute, including how and when the medicine should be taken, increasing efficiency, reducing costs, and avoiding human flaws. These are just examples of the current, emerging narrative about automated and autonomous systems working in health care in the country.[25]

Rising inequalities and human rights at stake

Automation has also been introduced into tourism, one of the most important economic activities in Costa Rica. Some of the most tangible cases can be seen in the Chorotega region, where many of the most visited beaches and resorts are located.[26] This region suffered hugely due to the pandemic, going from the second most prosperous region in 2019 to the second poorest by 2020, which means that poverty increased by 52%.[27] Nowadays, lots of hotels do not need personnel at reception, because there is an automated machine process that registers guests.[28]

While automation and autonomous systems provide advantages such as not getting infected by diseases nor needing social security, three of four jobs in Latin America could be replaced by robots.[29] Nonetheless, since human personnel in the region is cheap, it could still be better for some to stick with cheap human labour than to buy expensive robots.[30] People under poverty have been the most affected, as they cannot work from home nor do they have the necessary education to work on new technological innovations.[31]

However, technological advancements cannot and should not be stopped. The negative impacts of the pandemic could also be more serious if we did not have access to the internet and other technologies that have helped us in numerous ways. Nevertheless, risks to human rights are latent, meaning responsible innovation research is necessary. The most significant question for an already unequal country is how to advance technological development while leaving no one behind.

The role of civil society

In terms of legislation, the country presents several challenges that need to be tackled in order to manage science and technology responsibly. AI, robotics and other autonomous systems use large amounts of data in order to work.[32] Given all the recent developments, civil society priorities in Costa Rica should shift to address the new challenges and in a way that addresses the shifting relationship between technology and society. The country still lacks the policy, legal and practical mechanisms that are required in order to tackle the challenges that these new technologies introduce.

There is a need to advocate for an AI strategy in the country. The AI strategy recently approved in Brazil[33] provides a good model that might be suitable for Costa Rica. Brazil's strategy is principle-based and risk-based regulation. Applying a similar one in Costa Rica would help the country contextualise the implementation of the technologies in a concrete way, establishing directly responsibilities, including who will coordinate their implementation, what goals need to be meet, and how long it should take to accomplish a goal, with details such as how implementation will happen, and the financial costs.

Further, in a datafied society, other policies should be taken into consideration. Even though access to public information is contemplated under articles 11, 27 and 30 of the Costa Rican constitution,[34] civil society has revealed that institutions do not comply with information requested.[35] The lack of a specific law on access to information has made it very hard for transparency and accountability, because there was not a legitimate procedure to follow when asking for relevant public information, nor a body that ensured it. Therefore, civil society has demanded a law for accessing public information, not just creating the legal framework for institutions to do this as the constitution already establishes, but actually making it mandatory, with sanctions to those public officials who deny information requests.[36] It was not until May 2022 that the first law

25 La Republica. (2020, 17 November). Meditek pone a disposición robots para potenciar las farmacias inteligentes en Costa Rica. *La Republica*. https://www.larepublica.net/noticia/meditek-pone-a-disposicion-robots-para-potenciar-las-farmacias-inteligentes-en-costa-rica

26 Fernández Aráuz, A. (2021). *Desempleo, pobreza y desigualdad en Costa Rica durante la pandemia por el COVID-19: Consideraciones para una recuperación resiliente*. Konrad-Adenauer-Stiftung. https://www.kas.de/es/web/costa-rica/einzeltitel/-/content/desempleo-pobreza-y-desigualdad-en-costa-rica-durante-la-pandemia-por-el-covid-19

27 Ibid.

28 Ibid.

29 Ibid.

30 Ibid.

31 Lustig, N., & Tommasi, M. (2020). El COVID-19 y la protección social de los grupos pobres y vulnerables en América Latina: un marco conceptual. *Revista CEPAL, 132*, 283-295.

32 https://www.sas.com/es_cl/insights/analytics/what-is-artificial-intelligence.html

33 Ministério da Ciência, Tecnologia, Inovações e Comunicações. (2021). *Estrategia Brasileira de Inteligencia Artificial*. https://www.gov.br/mcti/pt-br/acompanhe-o-mcti/transformacaodigital/arquivosinteligenciaartificial/ebia-diagramacao_4-979_2021.pdf

34 http://www.pgrweb.go.cr/scij/Busqueda/Normativa/Normas/nrm_texto_completo.aspx?nValor1=1&nValor2=871

35 Abriendo Datos, et al. (2021, 28 September). Bicentenario sin derecho pleno de acceso a la información. *Delfino*. https://delfino.cr/2021/09/bicentenario-sin-derecho-pleno-de-acceso-a-la-informacion

36 Ibid.

of this kind was approved in Costa Rica.[37] Nevertheless, the law is still the subject of discussion within civil society, as it still does not establish an explicit obligation for the exercise of the right to access information, beside others. From now on, the role of civil society will be to keep on demanding this, as well as becoming very vigilant about the law's application, because it is fundamental for a transparent and accountable deployment of robotics and AI.

Finally, the data protection agency in the country is also very weak. It only responded to one of 236 complaints received in 2020.[38] At the same time, there is not a law against discrimination in the country that could also tackle biases that technologies generate. In telemedicine, data security and confidentiality in information systems must also be widely improved.[39]

Conclusions

This report shows a country that once was really prosperous and that had really strong institutions that were guided by the rule of law and that protected the digital rights of its citizens extensively, despite the absence of the laws mentioned above. However, Costa Rica has been experiencing alarming levels of increasing inequality that should really worry its citizens.

In a country in which automation and autonomous systems are a new concept, but where their use is growing in many fields of the working environment, it is fundamental that civil society organises to understand these new challenges and to advocate for possible solutions. It is also necessary that opportunities are created for all stakeholders to understand and prepare for this changing and dynamic field, including policy makers, business leaders and academics. Costa Rica still has to face many challenges in order to take advantage of the opportunities offered by telemedicine and other new technological processes. To advance in these areas it is necessary to strengthen training and administrative processes, and build capacity in the use of robotics and information technology. It should not just be about providing access to the internet and new technologies, nor creating education and training plans for professionals and users. Capacity building should instead be an integral process that unpacks the relationship between the deployment of technology and its impacts and consequences on society. A better understanding among stakeholders when addressing the needs of the country's AI-driven future would make debates and discussions more meaningful.

Building private-public alliances to deal with this future is also fundamental. Businesses, entrepreneurs and academics are advancing quickly in terms of developing innovations, but the public arena is staying behind, not seeming to understand what is going on.

At the same time, the development and review of laws, as well as the reform of institutions, such as the data protection agency that has not been efficient nor protective of citizen rights, needs to happen urgently. The future of work must be responsibly built.

Action steps

The following action steps are proposed:

- Organise meetings with different stakeholders for advocating the creation of a principles-based AI strategy.
- Monitor the needed reform of the data protection agency so that it is efficient and attends to every complaint effectively.
- Increase transparency and accountability through the new law on access to public information, explicitly including the obligation to do so, so that it is effective in practice.
- Approve a non-discrimination law that can also deal with biases produced by new technologies using AI, as well as those biases that affect the dynamics of workers and their recruitment.
- Provide training for people whose jobs are being automated or are likely to be in the future, so that they can build their capacity to be employable in the new market.

37 Madrigal, L. M. (2022, 27 April). Nueva ley de acceso a información pública reduce a la mitad plazo de respuesta de instituciones públicas. *Delfino*. https://delfino.cr/2022/04/nueva-ley-de-acceso-a-informacion-publica-reduce-a-la-mitad-plazo-de-respuesta-de-instituciones-publicas

38 Ruiz, G. (2021, 12 May). Prodhab tarda de diez meses a un año en resolver denuncias. *CRHoy.com*. https://www.crhoy.com/nacionales/miercoles-prodhab-tarda-de-diez-meses-a-un-ano-en-resolver-denuncias

39 Valerio, M. (2020, 14 September). Costarricenses podrán conocer más acerca de la telemedicina y sus beneficios. *SINART Costa Rica Medios*. https://costaricamedios.cr/2020/09/14/costarricenses-podran-conocer-mas-acerca-de-la-telemedicina-y-sus-beneficios

GLOBAL INFORMATION SOCIETY WATCH 2021-2022

DIGITAL FUTURES FOR A POST-PANDEMIC WORLD

Through the lens of the COVID-19 pandemic, this edition of Global Information Society Watch (GISWatch) highlights the different and complex ways in which democracy and human rights are at risk across the globe, and illustrates how fundamental meaningful internet access is to sustainable development.

It includes a series of thematic reports, dealing with, among others, emerging issues in advocacy for access, platformisation, tech colonisation and the dominance of the private sector, internet regulation and governance, privacy and data, new trends in funding internet advocacy, and building a post-pandemic feminist agenda. Alongside these, 36 country and regional reports, the majority from the global South, all offer some indication of how we can begin mapping a shifted terrain.

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