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Automation
for Good

Trends and Case Studies
2022 Report

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CONTENTS

Dear reader,

Thank you for your interest in building a more sustainable future with the help of technology. A future that puts peoples' well-being first without sacrificing the natural environment and our shared future on Earth. A more mature future in which we understand that we should care more about values such as kindness, responsibility, integrity, and ethics at the expense of consumerism and profit without purpose.

How can we get there with the resources available now? Our research and analysis detailed in this report have revealed that automation has the potential to transform industries, cities, and governments, provided that we design and deploy these technologies with a people-first mindset and ensure an inclusive and purpose-driven environment. In the following pages, you'll get more familiar with the concept of Automation for Good – its philosophy and impact on our homes and cities, food, health systems, education, work, and economy. You'll also see how Automation for Good can accelerate the transition to a circular economy, an approach that seems to be one of the best pathways to reach the UN Sustainable Development Goals (SDGs). The report contains a large variety of resources: from the most recent studies on automation and Artificial Intelligence (AI) to tens of case studies from companies, governments, and non-profit organizations that managed to achieve progress using automation.

We are thankful to our partners from UiPath, a leading enterprise automation software company, for their trust in supporting this report and the conversations it has spurred around the world.

This report was carried out by **Solutions.**, being a part of future-oriented initiatives under the umbrella of Social Innovation Solutions. From the international conversation platforms Future Summit and Climate Change Summit to our CEE incubators like Future Makers, and our foresight exercises, we aim to cultivate a world where we all work for sustainable solutions for the future.

Finally, because Automation for Good is a continuous process, we won't conclude the report here but rather provide a list of relevant trends for the upcoming period.

Enjoy your reading!

Ciprian Stănescu
CEO, **Solutions.**

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INTRODUCTION

An analysis of automation for good must start from two fundamental questions: "what constitutes 'good' and 'good for whom?'" Ever since the dawn of time, new technology was split between being used for "good" or "bad" purposes, albeit the distinction between the two was often controversial. Was dynamite an invention for good, as it was intended, or for evil? Its creator, Alfred Nobel, believed that the adverse effects outnumbered the benefits; however, the ability to destroy current patterns and processes is not necessarily a "bad" action. In the 1950s, Schumpeter coined creative destruction, which talks about replacing old, legacy, outdated production units (or processes, or infrastructure) with new ones[1]. This replacement, simultaneous with restructuring, drives forward the economy, although temporarily, the destruction may have a negative resonance and detractors. Luddites were against the steam engine, as they perceived it would deteriorate their livelihoods, but, overall, for society as a whole, that particular invention led to the first industrial revolution and, ultimately, to the world as we know it today.
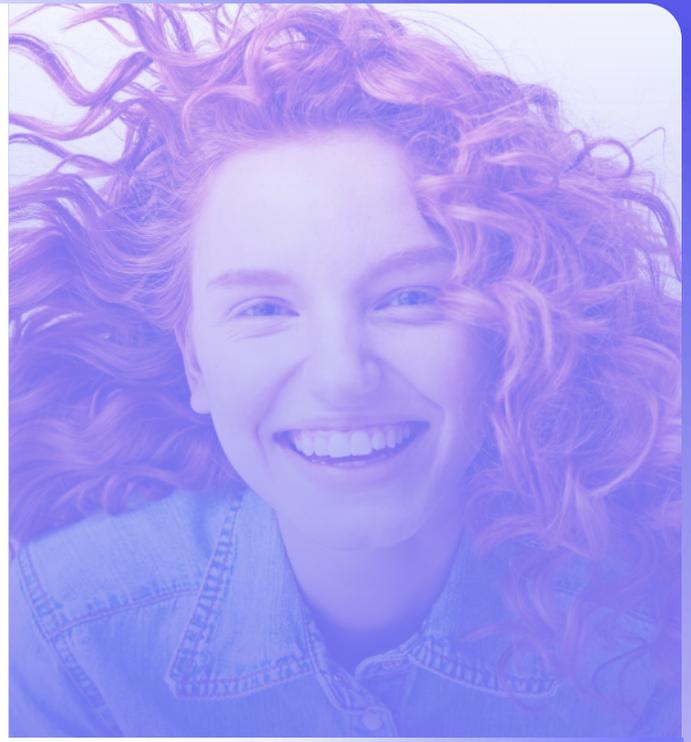
In this introduction, we shall address the scope of an analysis of automation for good by briefly touching upon the vastness of perspectives.

GOOD FOR… OR CUI BONO – A PHILOSOPHICAL ARGUMENT

There has been a constant philosophical quest in the past millennia searching for the fundamentals of "good." What is non-instrumentally suitable for a person is considered in philosophy as well-being[2], which, in the vision of utilitarians, must be maximized.

The task to talk about automation for good stems from the idea of "good for" – the individual or the community. Hedonistically, the individual may choose which solution provides more pleasure than pain or, if we refer to technologies, which brings more benefits or reduces the challenges, risks, or downsides. However, once we start looking at individuals as part of society (bound or not by formal or social contracts), we must look at well-being not as a subjective term[3], but as a utility function beyond the psychological aspects.

Specialists define five social dimensions for well-being: social acceptance, social actualization (defined as the "positive comfort level with society"), social contribution, social coherence, and social integration[4]. However, this taxonomy is less useful for

the transference to public policies or market signals than the concept of objective well-being defined by the Organization for Economic Co-operation and Development (OECD). The organization considers "eight dimensions of life"[5] (health, education and learning, employment and the quality of working life, time and leisure, command over goods and services, physical environment, social environment, and personal safety) to which the individual must have unobstructed access.

Good for the individual translates, thus, to good for society, although the opposite does not necessarily hold in the short term. However, this is the purpose of public policies designed to drive society forward and the topic of welfare economics. This economic branch relies on the linkage between individual and community (or aggregate, economy-wide) well-being. The measure in which public governmental actions increase social welfare is based on a social welfare function ranking resource allocations starting from their capacity to impact well-being.

1. More on this topic at https://www.econlib.org/library/Enc/CreativeDestruction.html
2. More on this topic in the Stanford Encyclopedia of Philosophy: https://plato.stanford.edu/entries/well-being/
3. Carruthers and Hood, 2004, https://www.researchgate.net/publication/317180687_The_power_of_the_positive_Leisure_and_wellbeing
4. Keyes (1998), Keyes & Lopez (2002)
5. OECD - How's Life? 2020: Measuring well-being
   | https://www.oecd.org/wise/how-s-life-23089679.htm#:~ :text=Beyond%20an%20overall%20analysis%20of,performance%20in%20dedicated%20country%20profiles

BUT WHAT IS
AUTOMATION FOR GOOD?

In the past decade, the concept of welfare technology has taken hold with policymakers, particularly in Scandinavian countries[6]. It refers to "a digital transformation and system-wide approach beyond a single assistive technology, and to ensure that the work within health and social care is carried out with a focus on the individual's needs." Using welfare technology encompasses both knowledge of digitalization and ethical guidance[7].

However, Automation for Good should move beyond welfare technology, as it aims to be a transformative force at all levels: organizational, individual, and societal (including environmental). As part of a comprehensive white paper[8] published in 2021 by IDC and sponsored by UiPath, IDC launched the Automation for Good Manifesto comprised of five fundamental principles:

- **People are at the heart of automation projects, as both enablers and beneficiaries.**

- **Automation creates new personal development opportunities and skills horizons.**

- **Automation is a multipurpose tool for transforming organizations.**

- **Automation dividends should be invested in furthering your purpose.**

- **Automation should be pursued in the light, not in the dark.**

Thus, we may define automation for good as the process that, by involving automated technologies, generates a "positive impact on society today and the potential it creates for future change." Automation on its own may have limited impact; however, in conjunction with artificial intelligence and robotization, the transformative capacity at a societal level is undeniable.

Automation can be a force of good if it is founded on global ideals and principles. The 17 Sustainable Development Goals (SDGs) included in the United Nations 2030 Agenda for Sustainable Development offer a strong foundation for Automation for Good principles. SDGs are urgent calls for actions from all countries, requiring global partnerships and offering a new paradigm for prosperity and sustainability.

Automation has had a transformative impact on economic growth and industry innovation and it can have a huge impact on society and the environment, addressing a broad range of SDG targets.

How can automation become a force for good and how can it be paired with the SDGs targets for a better world and a better future? First, any organization interested in exploring digital transformation needs to understand how automation has been used in the past, and how it is being used today in order to find the best solutions.

Lastly, the imperative of automation for good derives from a need to bridge the short-term inequalities generated by an economy with minimal human intervention. Enhancing operational efficiency with digital transformation requires
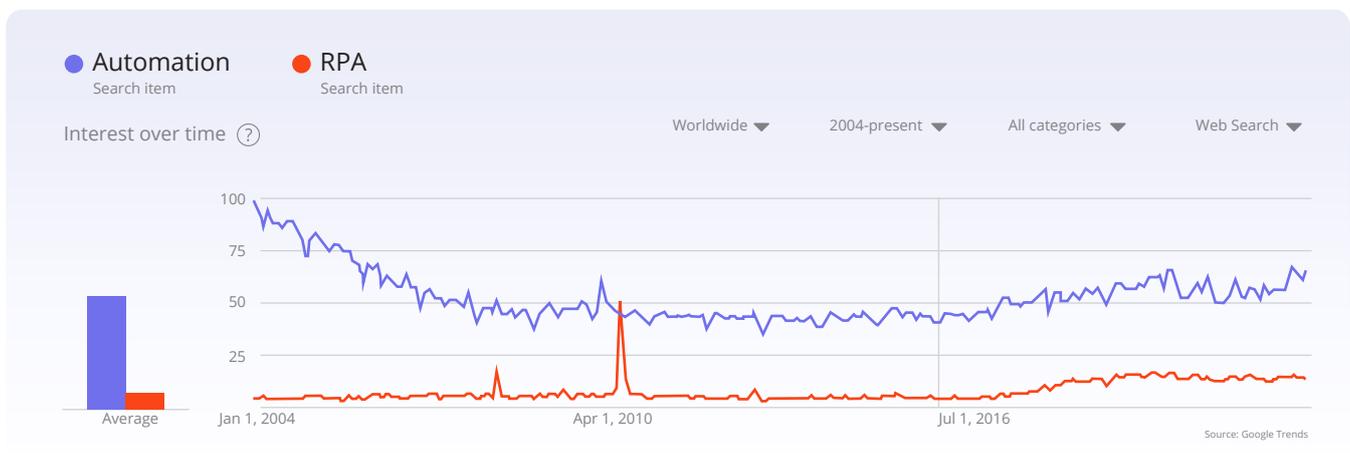
Source: Google Trends

6. Particularly relevant as Denmark and Finland have the highest shares of enterprises using AI technologies in the European Union – in 2021, as per Eurostat (https://europa.eu/!9qfgJP

7. Hofmann, 2012; (Ethical Challenges with Welfare Technology: A Review of the Literature | Request PDF); Zwijsen et al., 2011 (Ethics of using assistive technology in the care for community-dwelling elderly people: An overview of the literature | Request PDF)

8. IDC's Future of Work 2021 https://www.uipath.com/resources/automation-whitepapers/idc-future-of-work-automation-for-good

automated processes, which may lead to an increase in autonomous systems, dismissing the need for human workers. Hancock (2015) asked a crucial question: "what work remains?"[9]

The interest in automation (and RPA) is steadily growing (as noticeable from Google), while still remaining a topic for specialists. A Google Scholar search for automation yields some 5 million hits, with 10% of these since 2018 and some 12,000 hits for RPA – robotic process automation with 9,700 of those since 2018, highlighting that the latter is growing in interest for researchers.

To maximize its impact and deliver on its promise to help achieve the SDGs, this growing interest in the usage of new technology, in general, and automation, in particular, must prompt more and more real-life examples for how technology can help tackle such societal challenges. In other words, technology for good must prove its functionality, applicability, and scalability.

When discussing the possible influence of automation on people and communities, a human-and societal-centric perspective is required. In this research, we focus on the relationship between automation and humans at multiple stages of interaction: (i) at home and school; (ii) at work; and (iii) in the community, to investigate and comprehend how automation can positively influence and contribute value to all of these stages. The role of automation in the private and public sectors is examined furthermore.
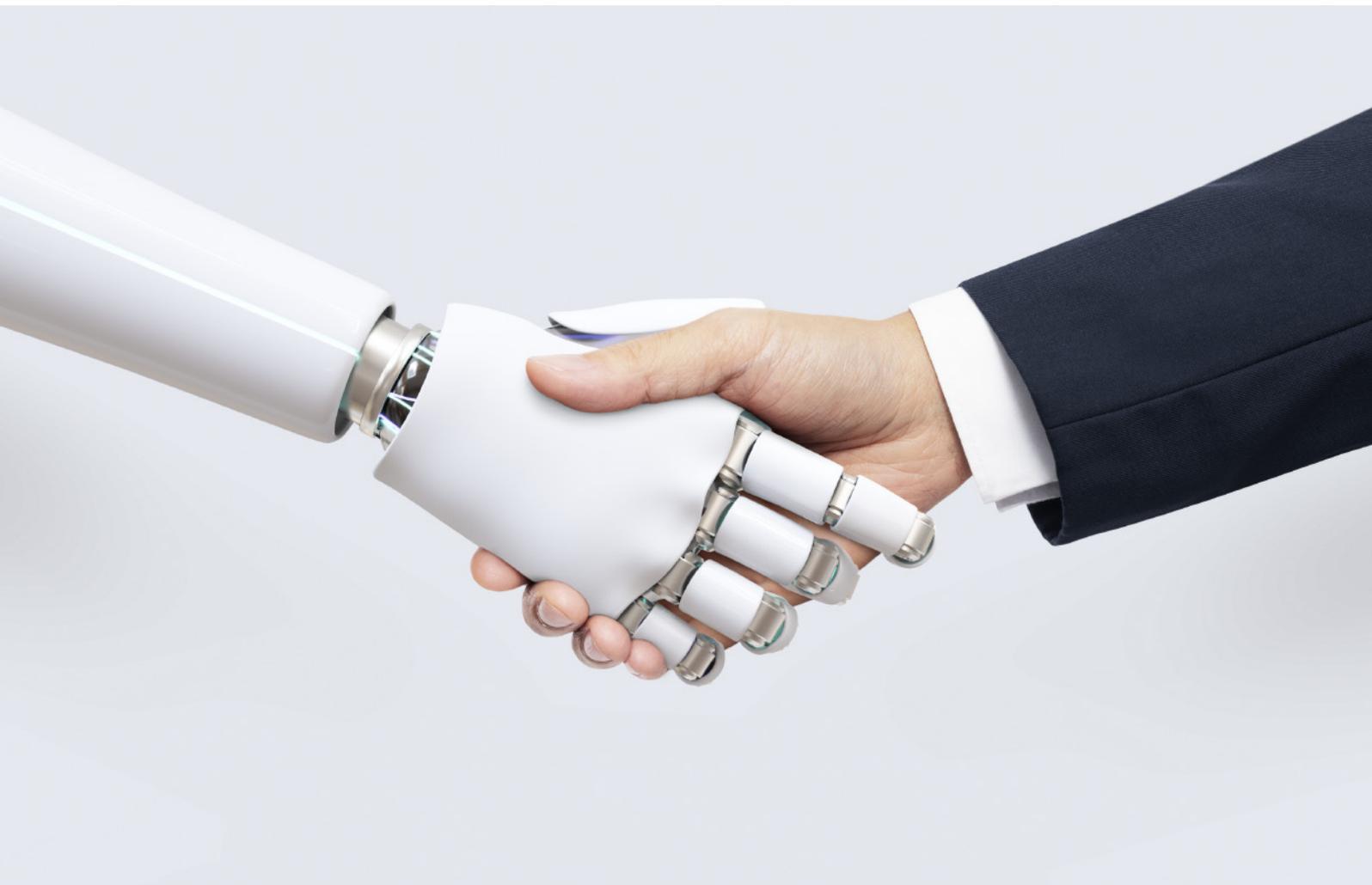

9. P.A. Hancock (2014) Automation: how much is too much?, Ergonomics, 57:3, 449-454, DOI: 10.1080/00140139.2013.816375
| https://www.tandfonline.com/doi/abs/10.1080/00140139.2013.816375

AUTOMATION FOR GOOD - COMMUNITIES

The impact of automation for good on communities for living – humans at home and at school

The Sustainable Development Goals (SDGs) are a call to end poverty, safeguard the environment, and ensure human peace and prosperity. Although 2030 was set as the targeted year, these goals may appear impossible in the context of the pandemic and the emergence of war in Europe. Nonetheless, the guidelines are an encompassing framework for actions that technology should support.

We refer in this first stage to Communities for Living – zooming in on the interaction of the individuals with technology in their day-to-day lives, from their homes to healthcare and education. Individual well-being means that person (regardless of age, gender – Goal 5, or abilities) has decent housing (Goal 11), access to clean water and sanitation (Goal 6), access to quality education (Goal 4), good health (Goal 3), affords clean energy (Goal 7), does not suffer from hunger (Goal 2) or poverty (Goal 1) and can interact in a non-damaging way to the environment (Goals 14 and 15).
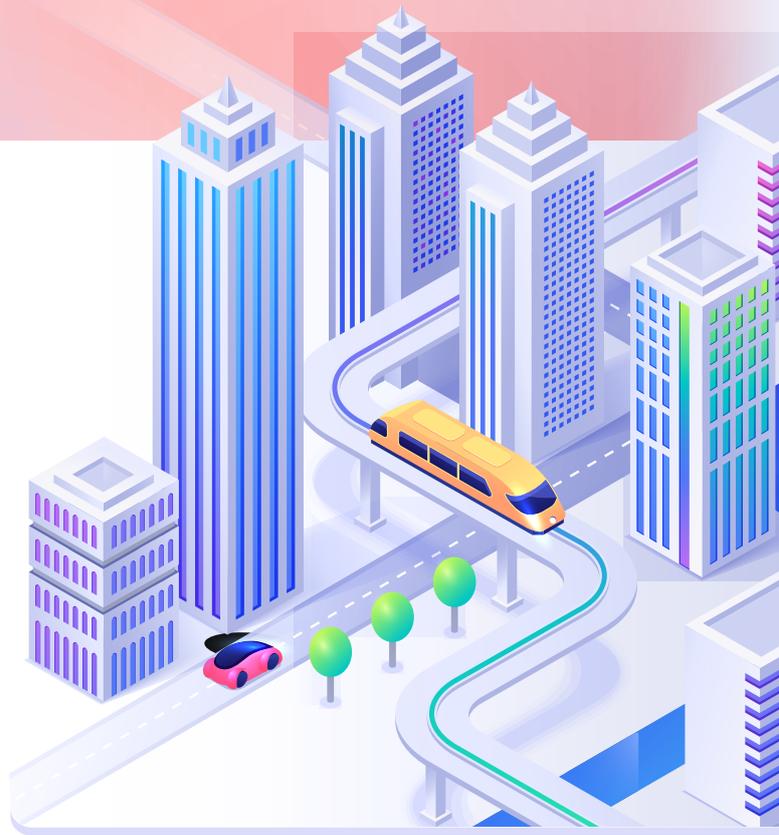
Automation supports humans in better designing interactions for increased affordability and accessibility. We split the analysis in this section into the impact of automation on creating better homes, better food, better energy, better healthcare, and education, identifying examples of automation usage in all these cases at either public or private levels.

Better homes and cities

Housing is an intrinsic part of the individual perception of well-being, and policies dealing with affordable housing are often perceived as means to tackle poverty and inequality. Housing is fundamental to achieving the SDGs, directly linked to the life dimensions referring to the physical environment, personal safety, command over goods and services, and indirectly to time and leisure. Goal 11 (Sustainable Cities and Communities) focuses on it directly; however, one may argue that Goal 6 (Clean Water and Sanitation) and Goal 15 (Life on Land) are linked as well.

Living in an affordable city with sustainable homes, allowing for optimal integration of people with disabilities, children, and the elderly, is essential to community well-being. All these elements may be impacted positively by automation, from city planning (traffic management, for instance) to the design and construction of sustainable buildings to the

interaction of the individual with the city. The market for building automation and "smart building" hardware and software are expanding, indicating that automated control systems for buildings are becoming more popular among consumers. Furthermore, the cost of stationary batteries and distributed renewables such as residential photovoltaic (PV) systems has dropped dramatically over the last two decades, encouraging increased deployment.

Smart City Technology is making cities more sustainable and pleasant places to live. Smart utility meters, for example, operate with a smart grid to help utility companies monitor the flow of electricity more efficiently. Smart meters allow users to track their energy consumption, and Insider Intelligence estimates that utility companies will save $157 billion as a result of their adoption by 2035[10].

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10. Zoldan, A (2022) | How Smart City Technology is Making Cities Around the World More Livable
https://www.nasdaq.com/articles/how-smart-city-technology-is-making-cities-around-the-world-more-livable

What can smart city technology accomplish and how can it help achieve a more sustainable city? Smart grids may one day make home energy storage and solar panels commonplace (Goal 7: Affordable and Clean Energy). Even more, operations directors can compare data over time, investigate patterns, conduct data-driven investigations, monitor service performance, and analyze behavior, therefore supporting decision-makers in integrating all of the system's data into a single dashboard.

Creating better cities also refers to **actively transforming local public administration** in a way that it delivers to its citizens. Automation offers more flexibility, efficiency, and general happiness for governments with ever-changing objectives.

Nonetheless, three significant challenges exist: controlling costs, providing effective and efficient services to citizens, and scaling to meet changing needs. As with the private sector, technology adoption and digital transformation can save costs and improve outcomes.

The public sector approach must involve automation as a crucial component while also guaranteeing the preservation of individuals' privacy rights. The significant benefits of scale, productivity, and improved employee and citizen outcomes will only rise as the underlying technology evolves. The European Commission wants to give police more facial recognition powers and has presented a proposal for a new regulation last year. The original Prüm was passed in 2005, while a preliminary version of Prüm II was introduced in December 2021. According to this, millions of images of people's faces would be included in a vast international database system, allowing facial recognition to be exploited on an unprecedented scale. Prüm II data-sharing[11] ideas are part of a larger strategy to "modernize" policing across the continent. Police will have more "automatic" access to shared information, and they will be able to work together closely and identify suspects and criminals across Europe. This endeavor, albeit leading to safer cities, may also prove intrusive to citizens, and privacy must be respected.

For achieving better homes, automation enables the **construction industry** by allowing for an optimal, more efficient, cheaper, and environmentally friendly building. Add to this status quo, the construction industry is hard-labor intensive, and specialists are scarce, leading to a clear need for automated support. Automation of construction processes can help the construction industry reach its challenges of high demand for buildings and infrastructure and the need for sustainability. It can be used at many project stages, from software-based design through automated off-site and on-site construction to sharing collected data on the systems and energy use of finished buildings—all documented in cloud-based living models.

Automation for better homes and cities as a force for good addresses the skilled-labor gap, allows for more safety for workers at construction sites, permits better data collection and analysis, and thus, leads to a higher personalization of buildings for inhabitants' needs and for sustainability (by using alongside automation technologies, other technology-based solutions such as off-site modular construction or robotics) and lastly, increases predictability and scalability, as well as efficiency and productivity which can assist better management to ensure sustainable consumption and production patterns (Goal 12). The latter brings lower costs and may ultimately lead to an increase in homes' affordability.

11. Proposal for REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL on automated data exchange for police cooperation ("Prüm II"), amending Council Decisions 2008/615/JHA and 2008/616/JHA and Regulations (EU) 2018/1726, 2019/817 and 2019/818 of the European Parliament and of the Council - https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52021PC0784

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Examples of using automation for better homes and cities – the private sector perspective:

Automation speeds up green initiatives and software robots can help in reaching sustainability goals and with the assistance of software robots[12], new, innovative green solutions can be created.

2. Unicontrol3D[13] is a software-centric system that simplifies the usage of excavators, wheel loaders, and backhoes, placing technology in the hands of even the smallest contractor and perhaps making rental equipment easier to use. Unicontrol focuses on boosting operator effectiveness and efficiency, removing the need for site surveyors, and providing relevant tools to the operator: the project plan can be seen instantly thanks to the projected screen in the cab. Unicontrol does not automate manufacturing, but it does automate data collection for reports and as-builts.

3. Sønderborg in Southern Denmark[14]**:**

a). 576 flats were equipped with model predictive control (MPC) systems, which collect data on various parameters (weather, showering habits, expensive peak hours). Sensors were installed in the apartments to allow artificial intelligence software to manage the HVAC system properly. The technique saves occupants money on their energy bills and will enable buildings to act as energy batteries, shifting usage to affordable hours of the day.

b). Turning supermarkets and data centers into heat providers: People can now harness the heat from supermarkets to heat local populations using existing cooling and heat recovery systems, converting supermarkets to prosumers. As a result, self-sustaining energy solutions that have a low environmental impact while also saving money are developed.

12. AiThority Interview with Dhruv Asher, SVP of Business Development and Product Alliances | 2021 | https://aithority.com/robots/automation/aithority-interview-with-dhruv-asher-uipath/
13. Automated Excavator Innovations from Upstart Companies | For Construction Pros
14. A heat recovery system installed in a local supermarket recycles 95 percent of the excess heat from the cooling system. Since installing the heat recovery system, the supermarket has saved approximately 70% on district heating costs and 37% on electricity. The excess heat heats the store as well as approximately 15 nearby households. | World Economic Forum | The energy we don't use: How to realize the benefits of the greenest, most affordable energy

Examples of using automation for better homes and cities – the public sector perspective:

Many divisions that deliver city services are becoming more automated due to technology.

1. Bogota, Colombia's capital, has a population of 7.8 million people and 1.2 million cars. [Bogota](#) is an example of a smart city with one of the world's most comprehensive mobility management solutions. Smart city technology merged the city's systems into a single central control center. The integrated system includes an accident reporting tool, 1,600 agents, towing trucks, a Twitter feed, traffic signals, bicycle lanes, bus stops, and street works with hundreds of sensors. Results: a) Emergency response times improved by 40%, and b) Lowered traffic congestion reduced the time people spent driving through and helped reduce air pollution, saving the city money.

2. Drover AI's technology combines [machine learning and computer vision](#) to accurately detect when an e-scooter enters restricted riding zones, such as sidewalks. The vehicle's speed can be automatically reduced to help prevent pavement riding. Furthermore, the technology can determine whether an e-scooter is adequately parked, aiding [Voi](#) (shared electric scooters and e-bikes app) and the Oslo City Council in regulating how scooters are parked. Using innovation to ensure safety for e-scooter rides also benefits micro-mobility inside crowded cities.

3. Robotic Process Automation (RPA) can automate many [Smart City tasks](#)[15], including operations, reporting, and monitoring. Many emerging technologies, including artificial intelligence and machine learning, are combining to fuel innovation and agility in today's transformation. The main goal is to establish a digital workforce in which humans are helped by software robots to increase the workforce's full potential and reduce handling time. In India, the ICCC (Integrated Control and Command Center) teams are discovering RPA relevance to support them in running and navigating various Smart City applications such as video surveillance, intelligent traffic management systems, vehicle tracking systems, environmental monitoring applications, to name a few.

4. In the Czech Republic[16], in the [Moravian-Silesian Region](#), the Department of Regional Development and Tourism received an overwhelming number of boiler replacement grant applications in 2018, and this would have been a time-consuming and repetitive process. The Regional Authority used RPA to validate applicant information, send emails, and perform other tasks to help speed up the process. The Regional Authority was able to increase the delivery of green boiler grants to 1.2 million people by using automation. This improved the air quality in surrounding areas. Therefore, using Robotic Software Automation [helps achieve Sustainability Goals](#) and also increases the quality level of provided public services.

15. Leveraging Gen-Next Cities with Robotic Process Automation http://bwsmartcities.businessworld.in/article/Leveraging-Gen-Next-Cities-with-Robotic-Process-Automation/25-03-2020-187232/
16. The Regional Authority of the Moravian-Silesian Region saves 8,000 hours per year thanks to the introduction of RPA | https://techstra.tech/?p=659

Better food

With a Sustainable Development Goal dedicated to eradicating world hunger (Goal 2), the quest for better food is fundamentally a quest for survival of the species, even more so than simply well-being. Therefore, we can consider that another branch of Automation for Good is its capacity to influence farms to be more productive, become cost-efficient[17] and decrease their impact on the environment.

Crop diseases, a lack of storage management, pesticide control, weed management, a lack of irrigation, and a lack of water management are some issues causing problems in the agricultural field. These issues can be solved using automation, IoT, robotics, machine learning, AI, deep learning, or wireless communications. Today, there is an urgent need to decipher issues such as harmful pesticides, controlled irrigation, pollution control, and environmental effects in agricultural practice. Automation of farming practices has proven to increase soil gain while also strengthening soil fertility[18].

SDG Target 12.3 aims to cut global food waste in half at the retail and consumer levels, as well as reduce food loss during production and distribution. AI and automation can bring several opportunities at the stages of cultivation, processing, logistics, and consumption, including image recognition to detect when the fruit is ripe to pick, better matching food supply and demand, and boosting the value of food by-products.

The global food system produces enough food to feed the whole world's population, but around a third of it is lost or discarded. By 2050, estimates require a 60-70% increase in food needs. Farms can be managed more efficiently with robotic process automation and AI solutions, saving both the farmer and the customer money.

Precision farming can help the agriculture industry reduce its environmental impact and provide increased amounts of food to feed the growing global population by applying irrigation, fertilizers, and pesticides at variable rates adapted to the needs of crops. Farm automation transforms the current agriculture business by utilizing drones, robotics, and software, particularly Smart Farming Apps.

An increasing number of agriculture enterprises are turning to robotics to construct autonomous tractors, harvesters, seeders, and waterers. According to Bank of America Merrill Lynch Global

Research1[9], the agricultural drone industry will produce 100,000 jobs[20] and $82 billion in economic activity in the United States over the next decade. Imagery, product application, and transportation of supplies are all part of the enormous potential use of on-farm drones by 2050, including jobs that have yet to be envisaged. Farmers can use Smart Farming Apps to monitor the progress of their farms or livestock and solve problems such as the need for more water or enhanced pest control measures.

Robotic process automation (RPA) provides a more efficient and less resource consuming method to satisfy consumers expectations and the ever-increasing demand for quality food and logistics that humanity is challenged with. RPA can assist agriculture in a variety of ways, including

- crop seeding using an identification process that analyzes soil quality and density;

- the precise amount of herbicides to be applied using sensor vision technology and image recognition that detects weeds; and

- identifying and plucking the right moment of harvest for each ripe fruit using a computer-vision robotic attachment (when crops are gathered quickly, and there is no loss of the valuable harvest, customers will not be affected by high food prices and rising labor costs).

17. "Creators AeroFarm say the vertical farm is 390 times more productive per square foot than a field farm." | https://www.forbes.com/sites/bernardmarr/2022/01/28/the-big-gest-future-trends-in-agriculture-and-food-production/
18. Jha, K., Doshi, A., Patel, P., & Shah, M. (2019). A comprehensive review on automation in agriculture using artificial intelligence. Artificial Intelligence in Agriculture, 2, 1-12.
19. Trending 2050: The Future of Farming
https://www.syngenta-us.com/thrive/research/future-of-farming.html
20. Demand for Drone Pilots Soars
https://www.vaughn.edu/blog/demand-for-drone-pilots-soars-uav-jobs-that-pay-over-100k/

Examples of using automation for better food – the private sector perspective:

Automation can deliver the solutions that agriculture and logistics need for the [twenty-first century and beyond](#)[21].

1. Beewise has created an autonomous beehive that allows beekeepers to treat their hives remotely. It uses computer vision, artificial intelligence to automate climate and humidity control, pest control, swarm prevention, and harvesting and harvesting. In the face of modern obstacles such as diseases and climate change, the wooden box created 150 years ago does not allow beekeepers to retain healthy bees, especially when bumblebees are expected to pollinate 75% of global crops (vegetables, fruits and seeds) for a population of 7 billion people. [Beewise](#)[22] created the [Beehome](#) platform, a commercial AI-powered apiary that fully automates beekeeping while improving pollination and honey output. The technique is not just for honeybees; it can also help other bee species on the verge of extinction.

2. By-the-Plant Crop Management - Blue River Technology created a precision-smart implementation: monitoring lettuce plants in the field using cameras, processors, computers, and quarter-inch sprayers. [This technique uses fewer chemicals](#) and has a reduced environmental impact that directly promotes sustainable agriculture, an important concern to reach Goal 2 - Zero Hunger.

3. Kepak[23] is a family-business and one of Europe's leading meat producers in Ireland and UK In 2018, the company had six employees processing invoices in a laborious, time-consuming process. The implementation of RPA in the activity of the accounts payable team in the finance department allowed four members of the team to move onto more interesting roles and focus on high-value activities, removing 2,388 hours of repetitive tasks a year. [Kepak](#) currently operates ten automations, saving 15,000 hours of work each year.

4. Felleskjøpet Agri[24], the biggest supplier of technology and equipment to Norwegian agriculture, teamed up with RPA specialists TietoEVRY to create automated and efficient business processes. [Since the implementation of RPA in 2018](#)[23], the company has reduced the workloads for their staff and, consequently, got rid of the backlogs that build up when busy and, most importantly, reduced price discrepancies by more than 50%.

21. Mitrais | Robotic Process Automation in Agriculture and Logistics: the 21st Century Necessity | https://www.mitrais.com/news-updates/robotic-process-automation-in-agriculture-and-logistics-the-21st-century-necessity/
22. CORDIS EU Research Results | https://cordis.europa.eu/project/id/953381
23. Kepak offers a wide range of goods and services to supermarkets and the hospitality industry
https://www.uipath.com/resources/automation-case-studies/kepak-welcomes-software-robots-to-the-family
24. RPA Use Cases in Agriculture - Felleskjøpet Agri | UiPath https://www.uipath.com/resources/automation-case-studies/felleskjopet-agri-agriculture-rpa

Better energy

Throughout the Millenium Development Goals (MDGs)' operating phase and the negotiations for the 2030 Agenda, it became increasingly clear that energy is the bedrock of economic and social progress, without which the elimination of precarity and poverty is elusive. Intelligent automation (IA) and artificial intelligence (AI) are two technologies destined to revolutionize **the electricity industry**. Large enterprises are using automation platforms to drive meaningful change. A global industry is forming and it will use IA and AI in practically every facet of sustainable electricity production and delivery. If scaled across industries, digital technologies could provide up to 20% of the 2050 reduction required to achieve the International Energy Agency's net-zero trajectory in the energy, materials, and mobility industries, according to a study conducted by Accenture in collaboration with the World Economic Forum[25].

Automation, robotics, and IoT are are among the digital technologies that have the potential to enable decarbonization in the energy and mobility sectors. Digital use cases, according to the study, can reduce greenhouse gas emissions by up to 8% by 2050. This would be accomplished through enhancing the

efficiency of carbon-intensive activities and building energy efficiency, as well as installing and controlling renewable energy with artificial intelligence-powered by cloud computing and highly networked facilities powered by 5G.

Governments all over the globe have made initiatives to improve renewable energy output as the demand for renewable energy continues to rise, contributing significantly to the expansion of the global market for wind power automation. Stringent low-carbon regulations, a better return on investment, and increased awareness of green energy are key factors influencing this demand. Renewable energy's contribution to global electricity demand was anticipated to be around 27% in 2019. It rose to 29% in 2020.

Wind turbine manufacturers are installing automated controls that help improve efficiency while generating electricity with the help of smart, automated devices. Several new players have entered the worldwide wind automation market due to the growing demand for global wind automation solutions. Many of these market players[26] have adopted various measures to keep the industry competitive and evolving.

Benefits of using automation in the energy sector:

Customer experience: Utilities can avoid leaving customer service employees with complex systems and many data sources by combining CRM and billing systems. Digital workers can handle the heavy lifting of integrating data into a single consumer perspective.

Grid Transformation: Artificial intelligence (AI) and other technologies that improve grid operations expertise can help better balance variable supply and demand, energy efficiency, and outage response.

Legacy infrastructure: Because the digital landscape for many organizations is a mix of old and new, and the ability to take data from decades-old customer IT systems and blend it into modern workforce management systems is still done by humans cutting and pasting from one system to the next, automation and AI would benefit operational response teams and provide efficiencies. Humans will also spend more time in empathic conversations with consumers who are usually under stress, as most clients' calls deal with an issue.

Environmental reporting: includes indicators such as reporting on performance concerning regulation pollution and energy generation targets.

25. Digital technologies can cut global emissions by 20%. Here's how | World Economic Forum | https://www.weforum.org/agenda/2022/05/how-digital-solutions-can-reduce-global-emissions/
26. Key companies in the Global Wind Automation Market: Siemens AG, Rockwell Automation, Inc., Bachmann Electronic GmbH, ABB, Schneider Electric, Emerson Electric Co., Bonfiglioli Riduttori S.P.A., Mitsubishi Electric Corporation and Yokogawa Electric Corporation. Global Wind Automation Market Report 2022-2027 - Growing Digital Transformation Trend and Rising R&D Spending
| https://www.prnewswire.com/news-releases/global-wind-automation-market-report-2022-2027---growing-digital-transformation-trend-and-rising-rd-spending-301556531.html

Sustainability is one of the top priorities for CEOs in the years to come, according to McKinsey[27], and automation and AI can do more than just accelerating digital transformation and boosting operational efficiencies. Data availability and quality are the biggest challenges with respect to reporting on environmental, social, and governance (ESG), according to Deloitte's survey[28]. As an example, RPA could be used by energy companies to automate the process of reading and extracting usage data from various applications and systems, as well as support data management. Similarly, businesses can use automation to extract data from utility bills to aid in reporting, monitor energy usage, and calculate their carbon impact. These automated processes can help with achieving UN Sustainable Development Goals (Goal 12: Responsible Consumption and Production; Goal 13: Climate Action). Automation and AI can equally offer solutions for good and enable sustainability and social impact as part of the company's ESG strategy.

Examples of using automation for better energy – the private sector perspective:

1. NRGi is a Danish consumer-owned energy company headquartered in Jutland. The group is owned by 225,000 shareholders and consists of 1,500 committed employees focused on delivering a greener and well-functioning society. When the Danish energy market opened in 2016, NGRi adopted a new billing system as a crucial component of its strategy. Speed was a key element that NRGi looked to achieve through automation, and the perfect path to minimize risk was through robotic process automation. RPA brought accuracy to data moving between multiple systems, and also, with the use of automation the company was able to dramatically reduce errors. According to Kim Damsgaard, Head of Service Delivery at NGRi, deploying robots saves up to 2,500 hours of work each month but without removing jobs and staff work. Rather, automation transforms work into activities that people want to do.

2. Schneider Electric is a multinational company providing energy and automation digital solutions for efficiency and sustainability. In 2017, the TSC 4.0 strategy (Tailored Sustainable Connected Supply Chain) was implemented. Schneider Electric's industrial site manufactures electrical switchboards and other office equipment. Producing paperwork for operators responsible for installing electrical switchboards was always time-consuming, but by introducing a robot capable of opening and printing documents, two employees who previously performed this task were able to free up time to support teams. The latest digitalisation technologies, including RPA, is perfect to improve team abilities and skills which are assessed by Schneider Electric's Global Chain Academy.

3. KAEFER Energy is a leading Norwegian insulation, scaffolding and surface treatment (ISO) company aimed primarily at the oil and gas industry. KAEFER Energy established its digitalization strategy to select the best digital tools that would contribute to streamlining and simplifying work processes. KAEFER Energy worked with Atea's RPA Developer to provide a range of robotic process automation (RPA) services and this allowed the company to accelerate its RPA program and digitalize its operations. The amount of time spent by humans gathering documents for invoicing was lowered from four hours to ten minutes and automations that go from concept to production in less than two months.

27. Five priorities for CEOs in the next normal. What matters most?
| McKinsey Live https://www.mckinsey.com/featured-insights/mckinsey-live/webinars/five-priorities-for-ceos-in-the-next-normal-what-matters-most
28. ESG executive survey: Preparing for high-quality disclosures https://www2.deloitte.com/content/dam/Deloitte/us/Documents/audit/us-esg-preparedness-disclosures-reporting-requirements.pdf

Examples of using automation for better energy – the public sector perspective:

Reducing costs and saving working hours are not the only benefits that automation can provide to a business. Software robots can play an important role in cutting carbon emissions, improving efficiency and reducing consumption on multiple levels, from paper to utilities.

1. Process mining is the initial step in an automation journey that identifies bottlenecks and inefficiencies, and how to improve them. And this can also be helpful for public services operators. It helps reduce wastefulness, which contributes to resource overuse that can also lead to **responsible consumption (Goal 12).** How to reduce paper usage in institutions[29]? Instead of using paper, ink and energy to print, sign and scan documents, all these actions can be managed digitally and much faster, registering accounting documents for administrative reporting and taxation.

2. Since 1846, **Bristol Water**[30] has provided important public water service to the communities within and around the city of Bristol. It employs 500 people and was one of the first water businesses to implement a Social Contract, a governance framework for engaging with and improving the well-being of local communities. Bristol Water has leveraged its 175-year experience of innovation, from reservoirs to robotic process automation. By way of example, with regards to invoicing alone, software robots are expected to handle close to 80 percent of the invoices received by the firm every year.

29. Can software robots help businesses to achieve their sustainability goals? | The Evolving Enterprise https://www.theee.ai/2021/08/19/12528-can-software-ro-bots-help-businesses-to-achieve-their-sustainability-goals/
30. Bristol Water Transforms Experiments into Enterprise Fit Automation | UiPath https://www.uipath.com/resources/automation-case-studies/bris-tol-water-transforms-experiments-into-enterprise-fit-automation

Better health

Welfare technology and automation may be used in healthcare for allowing diminished capacity people to enjoy life fully, for increasing value creation and enhancing organizational performance[31].

The use cases for better health are at the crossroads of public and private (depending on the type of healthcare system), with some more under the umbrella of public control than others.

According to the Centers for Disease Control and Prevention (CDC) WISQARS Leading Causes of Death Reports, in 2019, suicide was the second leading cause of death among individuals between the ages of 10 and 34, and the fourth leading cause of death among individuals between the ages of 35 and 44. According to Vibrant Emotional Health, a nonprofit organization administering the Lifeline number (US), the annual inbound call volume in 2020 was 3.5 million to Lifeline number (US) and 12.1 million to crisis center networks[32].

Intelligent automation can help automate various contact center processes to transform the caller experience as well as help achieve operational efficiencies. Self-service options for callers are important, some may prefer to chat online or text (sometimes referred to as "digital suicide prevention"), especially younger callers. The transfer from self-service to counselors can be achieved through hybrid automation, as required. Collaboration between crisis centers and IT departments can create a 'one office' by streamlining processes and extending the value of the existing technology stack. Using automation-powered integration protects data consistency across systems as well as improves data integrity and compliance with full audit trails.

It also contributes to monitoring the mental health issues and the overall well-being of the population (Goal 3: Good Health and Well-being).

31. Ratia, M., Myllärniemi, J., & Helander, N. (2018, October). Robotic process automation-creating value by digitizing work in the private healthcare?. In Proceedings of the 22nd International Academic Mindtrek Conference (pp. 222-227).
32. Using Automation To Help Suicide Prevention Hotlines With New 988 Calls https://www.uipath.com/blog/industry-solutions/automation-aids-988-suicide-prevention-hotline-call-surges

Examples of using automation for better health – the public sector perspective:

1. Automated reporting of HAI:
[Healthcare-associated infection (HAI) prevention programs](#)[33] rely on infection rate surveillance and feedback to clinicians and other stakeholders. Furthermore, HAIs are increasingly being mandated for public reporting. Manual surveillance methods are inefficient and lack standardization. Information technology advancements have accelerated the use of standardized and semiautomated methods. Several strategies can be used when developing automated surveillance systems regarding the degree of automation, standardization, and definitions used. However, the benefits of highly standardized surveillance may be offset by reduced clinical relevance and limited preventability. Thus, the choice of (automated) surveillance approaches should be guided by the intended goal and scale of surveillance (e.g., research, in-hospital quality improvement, national surveillance, or pay-for-performance mandates). The reason is that this choice dictates subsequent methods, essential performance characteristics, and the suitability of the data generated for the various applications.

3. Automation is used by the [California Department of Corrections and Rehabilitation](#) to streamline the administration of patient contacts. For example, a doctor orders a colonoscopy prep for drugs and the 48-hour liquid diet instructions are instantly forwarded to prison pharmacy staff and food service employees. Additionally, through coboting, visually impaired employees can "hear" information on the screen via speech reading interfaces and input information on the screen using voice-to-text technologies. Coboting utility defines more than working with bots, it already provides solutions for achieving Goal 10: Reduce Inequality, as well as Goal 3: Good Health and Well-being.
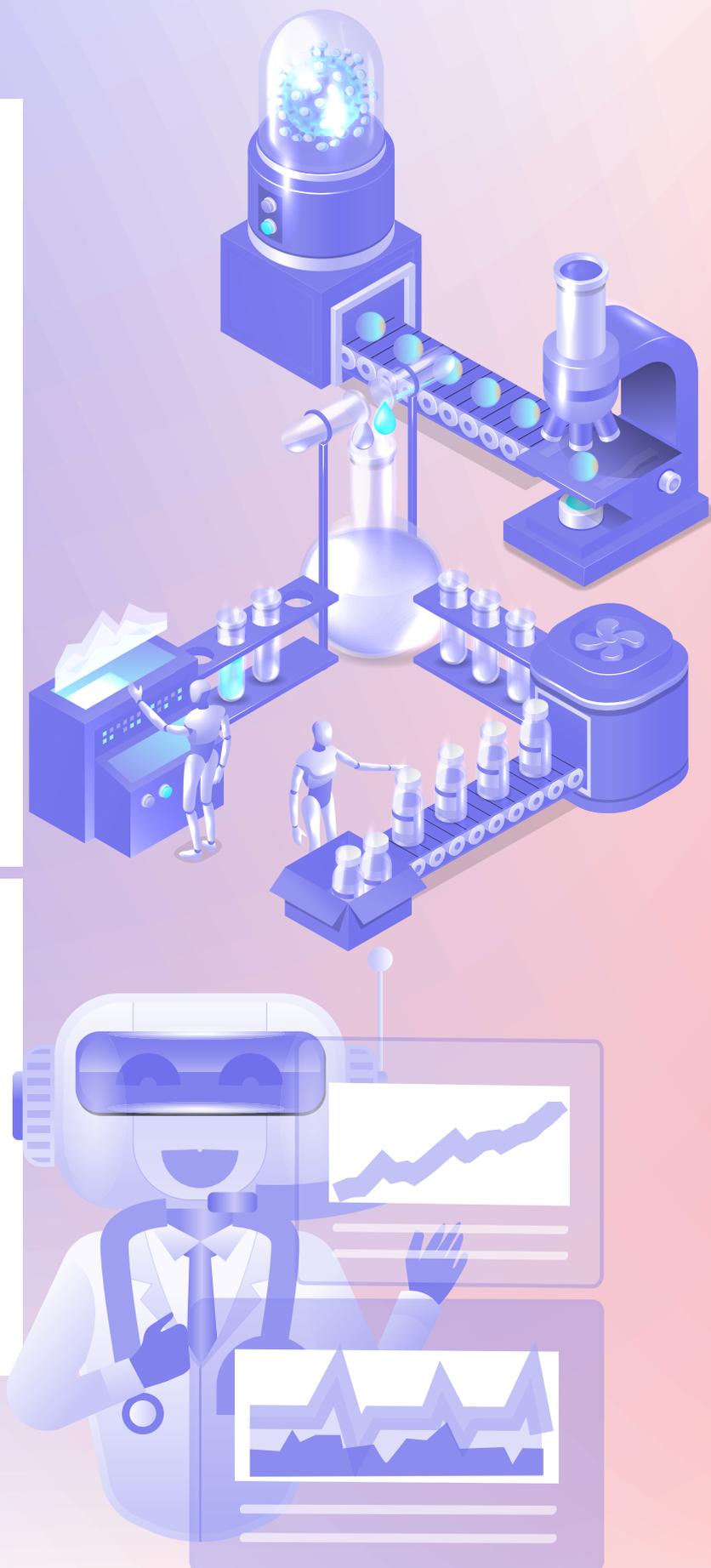
33. Maaike S M van Mourik, Eli N Perencevich, Petra Gastmeier, Marc J M Bonten, Designing Surveillance of Healthcare-Associated Infections in the Era of Automation and Reporting Mandates, Clinical Infectious Diseases, Volume 66, Issue 6, 15 March 2018, Pages 970–976, https://doi.org/10.1093/cid/cix835

Examples of using automation for better health – the private sector perspective:

1. Because of the pandemic, call numbers increased dramatically in contact centers. Many businesses turned to automation to deal with the huge fluctuations in demand. Contact center agents[34] must access different systems to find information to respond to a caller's request and using the right technology, the identity of the caller can be determined prior to the start of the call. This way the agent can have relevant information about the caller that can be retrieved and organized. Call center automation allows human agents to work more quickly and efficiently and also contact center automation can handle low-complexity calls entirely without the intervention of a human agent. Kearney, a global management consulting firm, conducted independent research that found AI and RPA solutions can reduce the total amount of time call center agents spend on processes by 25% by 2022 and 40% by 2027.

2. According to Amazon and Gallup's 2021 study[35], 56% of healthcare employees are highly interested in upskilling, but only 27% are interested in strengthening digital and technological abilities despite what Elsevier Health's Clinician of the Future survey found: healthcare professionals know current work practices must change. There is a gap between the training healthcare professionals believe they need and the training that interests them. **Robotic process automation (RPA)** using artificial intelligence (AI) and machine learning can make digitalization easier and more intuitive. This could better support healthcare professionals which, according to the American Association of Critical-Care Nurses, the COVID-19 pandemic caused almost 66% of nurses to consider leaving the profession.

3. McKinsey research says 97% of large U.S. hospitals are facing a nursing shortage[36]. The World Health Organization (WHO) reported a shortage of seven million nurses in 2016 and by 2030 the WHO predicts the shortage will expand to 18 million. When Covid-19 arose in March 2020, Mater Misericordiae University Hospital[37] was part of an automation pilot project aimed at reducing the administrative burden placed on staff. Software robots disseminated patient test results in minutes allowing nurse specialists to spend more time preparing for and dealing with Covid-19. The target of this project was to save the Infection Control Department three hours per day, 18 hours per week and 936 hours a year.

2. Artificial intelligence (AI) is increasingly being used in various sectors of society, particularly in the pharmaceutical industry[38], including drug discovery and development, drug repurposing, improving pharmaceutical productivity, and clinical trials, among others; Using the latest AI-based technologies will shorten the time required for products to reach the market. It will also improve product quality and overall safety of the manufacturing process and provide better utilization of available resources while remaining cost-effective. AI can help with drug design, decision making, determining the right therapy for a patient, including personalized medicines, and managing clinical data for future drug development. E-VAI is an analytical and decision-making AI platform developed by Eularis that uses ML algorithms and an easy-to-use user interface to create analytical roadmaps based on competitors, key stakeholders, and currently held market share to predict key drivers in pharmaceutical sales. It allows marketing executives to allocate resources for maximum market share gain, reversing poor sales and anticipating where to make investments.

34. The Power of Automation in a Post-Pandemic Contact Center
https://www.uipath.com/blog/industry-solutions/contact-center-automation
35. The American Upskilling Study: Empowering Workers for the Jobs of Tomorrow https://www.gallup.com/analytics/354374/the-american-upskilling-study.aspx
36. Better Nursing Employment Benefits Aren't Enough to Create True Workforce Resilience https://www.uipath.com/blog/industry-solutions/healthcare-automation-addressing-nursing-shortage
37. Project with the Mater Hospital to Free up Nurses https://www.uipath.com/newsroom/uipath-launches-a-pro-bono-automation-project-with-the-mater-hospital
38. Debleena Paul, Gaurav Sanap, Snehal Shenoy, Dnyaneshwar Kalyane, Kiran Kalia, and Rakesh K. Tekade (2021) | https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7577280/#bib0005

Better education

Automation for Good also leads to the bidirectional perspective of education for automation. As was the case with healthcare, it impacts both private and public, depending on the type of system.

Suppose the first relates to the ability of technology to allow for more substantive interactions between teachers and students. In that case, the latter implies that the future labour market will require an evergrowing development of new skills. The educational system requires comprehensive action plans for restructuring to be able to start serving Industry x.0. It should start to integrate formal and informal training, should offer education for all (Goal 4: Quality Education and Goal 10: Reduced Inequalities) and lifelong learning.

Automation for educational services refers to streamlining administrative processes, from scheduling to tracking attendance or grading. However, a Brookings study from 2019[39] claimed that 27% of current tasks are suited for automation.

Automations help improve the core business operations (IT, finance, HR) of the institution. Human resources, payroll, accountants payable/receivable and information technology are some of the most common uses of RPA for university back-office. RPA can remove up to 86% of manual hours from employee onboarding, process purchase-order invoices, review to identify expired employee credit card accounts, and reconcile employee IDs across multiple HR systems.

For hybrid education models, RPA implementations are not directly student-facing, but target student-facing functions, allowing employees to spend more time interacting directly with students and handling special cases.
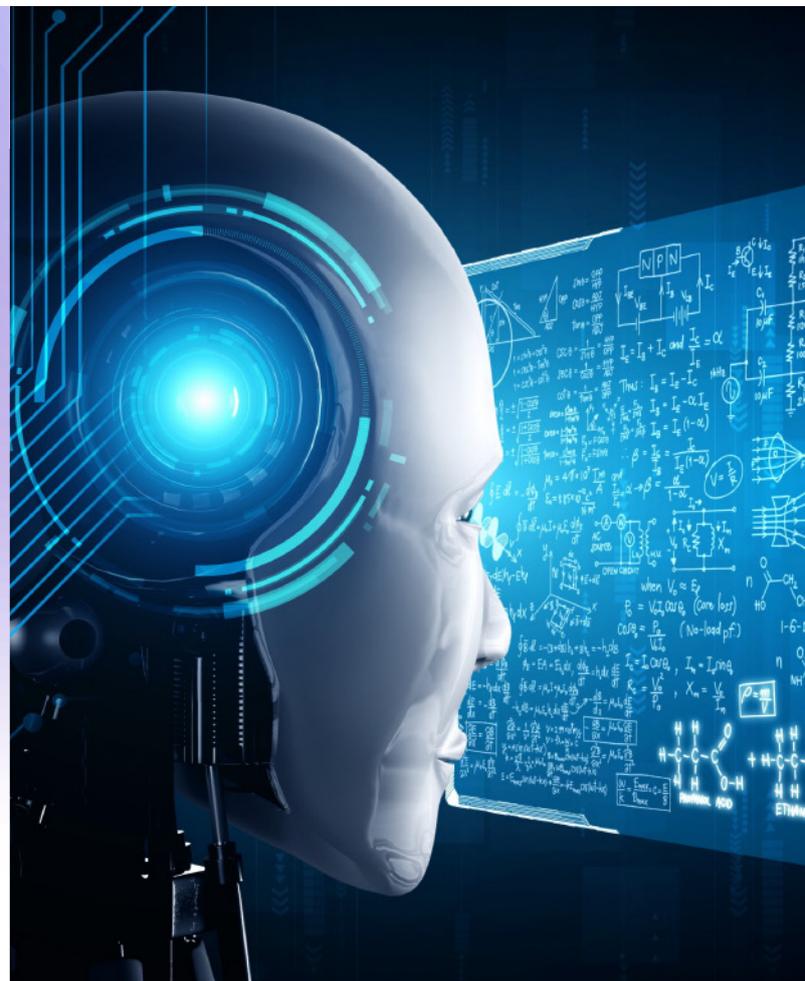
For student-facing education models, RPA implementations interact directly with data that is inputted or used by students; today the most common student-facing use cases for RPA are in the admissions office. Course or exam scheduling, facilities usage, student services, career services, and especially admissions are most commonly accessed through RPA applications,

Some examples of how automation can help streamline educational services:

1. The School of Automation has been launched in Ireland and the United Kingdom, and the initiative received support from the Limerick and Clare Education and Training Board[40]. At the School of Automation apprentices can master the skills needed to construct software robots.

2. Another example of how automation can help streamline educational services is **ICT Academy,** which has taught automation skills to over 500 academic institutions in India. In 2021, almost 70,000 students took part in the RPA Skill- A-Thon.

3. South Africa is the first country in the world to formally recognize "RPA Developer" as a job title[41] and has incorporated it in its national qualification system as of September 2021. This will most likely result in countless professional opportunities for South Africa's unemployed youth and contribute to the Goal 8: Decent Work and Economic Growth).

39. brookings.edu: Automation and Artificial Intelligence - How machines are affecting people and places (2019) | https://www.brookings.edu/wp-content/up-loads/2019/01/2019.01_BrookingsMetro_Automation-AI_Report_Muro-Maxim-Whiton-FINAL-version.pdf
40.   First Automation School in Ireland provides training in Software Robot Technology - Rockingrobots https://www.rockingrobots.com/first-automation-school-in-ire-land-provides-training-in-software-robot-technology/
41. Software automation is becoming a value driver for South African businesses | ITWeb https://www.itweb.co.za/content/KzQenMjVOOeMZd2r

Solutions.
Sustainability | Foresight | Innovation

AUTOMATION FOR GOOD - BUSINESS COMMUNITIES

The impact of automation on business communities – humans at work

The second layer we refer to in our mapping is business communities, people's interactions in their work, and how automation impacts them. These elements are directly related to Sustainable Development Goals 8 (Decent Work and Economic Growth), 9 (Industry, Innovation, and Infrastructure), and 12 (Responsible Consumption and Production). We tackle elements related to the phenomenon of the Great Resignation, a redrawing of work relations after the lockdown of 2020, and the global shift to remote work. We also refer to the impact of automation in creating more sustainable manufacturing supply chains, plugging into the circular economy, or linking to inclusive and sustainable finance.

Leveraging the power of automation technologies to advance companies' ESG commitments should include a minimum four-step process[42]. First, teams working with automation technologies should become familiar with the organization's sustainability goals and metrics. As a next step, they should start identifying processes and data flows related to such priorities and assess opportunities for automation. While undergoing this analysis, teams should see how processes can be redesigned to minimize environmental impacts, increase governance and transparency, and help data become more accessible. Last but not least, companies should deploy automation to help the collection and tracking of ESG-related data.

The combination of process mining and RPA[43] can be extremely beneficial in transforming a company into a leaner, greener corporation and taking direct action against climate change (Goal 13: Climate Action). There are four interrelated objectives that have to be at the center of process mining and RPA[43] approach for a business: "determine current challenges" in order to enable more informed business decisions, enhance efficiency and create new, sustainable and more environmental-friendly practices to reduce waste anywhere in the organization (Goal 12: Responsible Consumption and Production), 'humanize' work, and make it permanent by passing it on."[44]
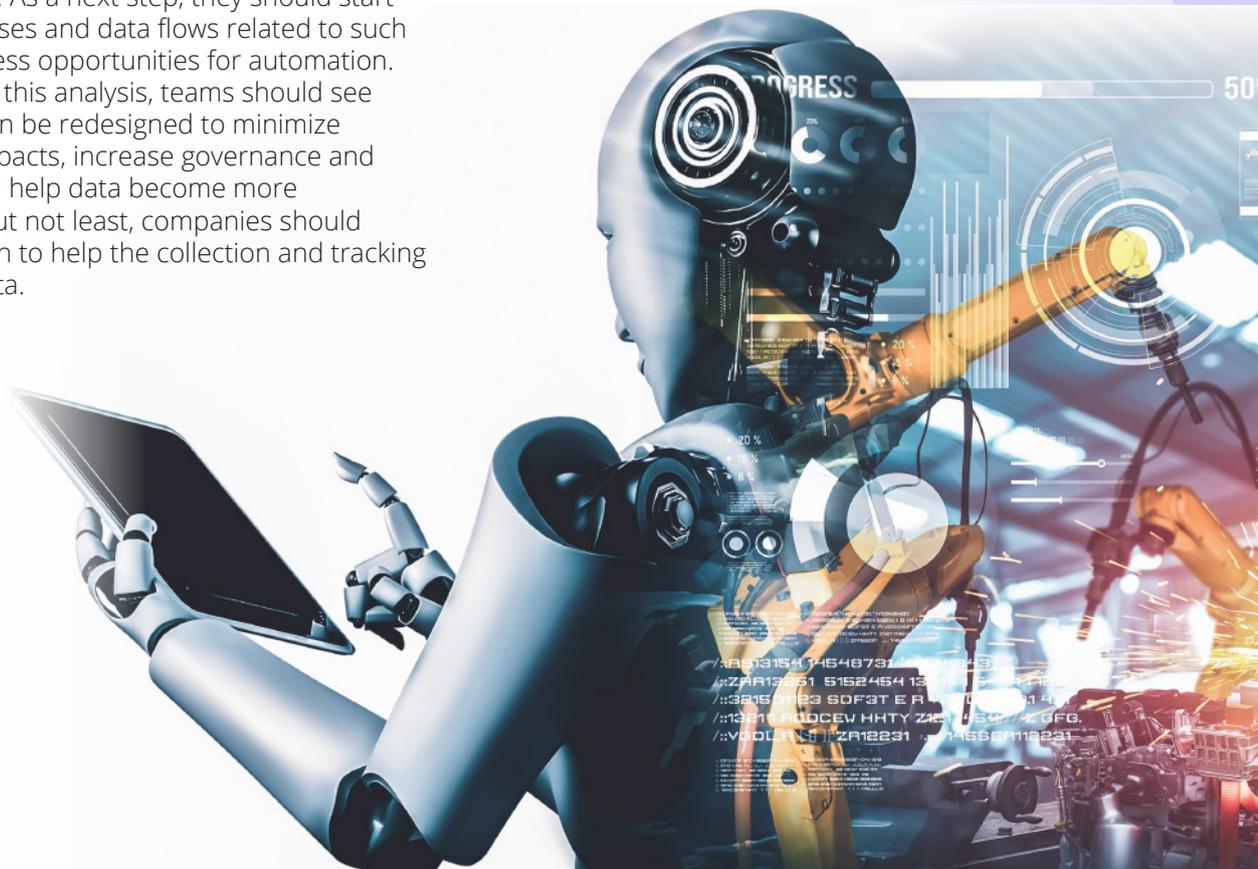
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42. Tackle Workforce Challenges in 2022 by Leveraging Automation for Good | UiPath https://www.uipath.com/blog/automation/tackle-workforce-challenges-leveraging-automation-for-good
43. Using Process Mining and Robotic Process Automation to Green Your Business | Jorim Theuns https://www.uipath.com/blog/digital-transformation/how-to-green-your-business-with-process-mining-and-rpa
44. Jorim Theuns, founder Dembrane - democratic intelligence| https://dembrane.com/

Better work

Tackling the Great Resignation

The World Economic Forum estimates that technology will create at least 12 million more jobs than it eliminates by 2025, indicating that automation will be positive for society in the long run.

Organizations should take use of all solutions that automation has to offer in order to drive the social impact component of ESG. According to the IDC Future of Work Global Survey (2022), 37% of employees are transferring to higher-value tasks as a result of automation, while over 30% are reskilling to advance their careers (Intelligent CIO Europe article)[45].

To accelerate these outcomes, companies must continue to target automation training and allow their workers to harness the full potential of the technology. Organizations should leverage automation to facilitate improved work-life integration, which is a crucial component of employee engagement and well-being (Goal 3: Good Health and Well-being).

In february 2019, McKinsey Global Institute released a study (Driving impact at scale from automation and AI Paper released in February 2019) which informed that "30% of tasks in the majority of occupations can be automated"[46]. Data entry, as well as other repetitive, low-judgment, high-error-prone, or compliance-required operations, could be automated.

Nowadays, companies are implementing more machine-learning processes, as well as spending more efficiently on AI and utilizing cloud technology, according to The State of AI in 2021, by McKinsey. According to the study, AI use continues to rise: 56% of all respondents report AI usage in at least one function, up from 50% in 2020. Companies headquartered in emerging economies, such as China, the Middle East, and North Africa, have seen the greatest increase in AI use (57% of respondents report adoption, up from 45% in 2020). Across regions, Indian enterprises have the highest adoption rate, followed closely by those in Asia-Pacific.

According to IDC, by 2023, one-quarter of Global 2000 companies will have acquired at least one AI software start-up to ensure ownership of differentiated skills and IP (intellectual property)[47]. Furthermore, by 2025, 30% of cities will be using automation from the combination of IoT, AI, and digital twins to blend the physical and digital and improve remote management of critical infrastructure and digital services, according to AI and Digital Twins in Smart Cities eBook[48].

The next generation of digital technology, defined by Allison Fine and Beth Kanter as "smart tech"[49] will allow people to focus on aspects of work that humans excel at, such as relationship building and intuitive decision making, and has a great potential to rehumanize work. Humanity should not question if humans will be competing with "smart tech" because they are complimentary, but organizational leaders will need to make informed, cautious, strategic decisions about how to use it. To automate large volumes of workload, organizations will need to undergo a global shift in how they structure their technological initiatives and train their employees. As complicated as it seems, as beneficial as it will be.

Companies that have already implemented these changes are accomplishing their automation goals while also enhancing customer and employee satisfaction. The latest McKinsey report of 2022[50] explains "how has the adoption of automation changed over the past two years" and "how will automation change what skills employees need": 77% of companies that are at least piloting automation believe their organization will require more advanced cognitive skills within the next two years. Respondents anticipate an increase in demand for new talent as more transactional jobs are automated.

Automation for Good strategy based on active multi-stakeholder cooperation is needed to create dynamic and agile learning programs that equip vulnerable workers with automation and AI skills (Goal 4: Quality Education; Goal 8: Decent Work and Economic Growth; Goal 10: Reducing Inequality; Goal 17: Partnerships for the Goals). "Ecosystems of Excellence" are the only solution to deliver the UN's SDG goals, according to IDC's Future Of Work whitepaper released in 2021[51] because it can bridge the digital divide and help meet the challenges of the future.

Consider this status quo in conjunction with the statistical fact that, in the US alone, over the next 30 years, more than 76 million baby boomers will retire, while only 46 million new workers will be able to take their place. With fewer people around to fulfill all jobs, automation can take over mundane tasks, making other work areas more populated and functional.

-73% of IT leaders (as surveyed by Productivity Inc.) say employees save 10 to 50% of the time they previously spent doing manual tasks.

-57% of IT leaders say that automation technology saves departments between 10 to 50% on costs previously associated with manual processing.

45. How automation and AI enable companies to meet sustainability objectives | Intelligent CIO Europe https://www.intelligentcio.com/eu/2022/06/29/how-automa-tion-and-ai-enable-companies-to-meet-sustainability-objectives/
46. Driving impact at scale from automation and AI |McKinsey, february 2019 https://www.mckinsey.com/~/media/McKinsey/Business%20Func-tions/McKinsey%20Digital/Our%20Insights/Driving%20impact%20at%20scale%20from%20automation%20and%20AI/Driving-impact-at-scale-from-automation-and-AI.ashx
47. The Four Most Important Digital Automation Trends 2021 | Forbes https://www.forbes.com/sites/sap/2021/02/16/the-four-most-important-digital-automation-trends-circa-2021/
48. https://www.idc.com/prodserv/insights?utm_source=eBook&utm_medium=Marketing+Social&utm_campaign=Smart+Cities#government-ebooks
49. Using Technology to Make Work More Human | Allison Fine and Beth Kanter, authors of The Smart Nonprofit: Staying Human-Centered in An Automated World (2022)
50. Your questions about automation, answered | McKinsey 2022 https://www.mckinsey.com/capabilities/operations/our-insights/your-questions-about-automation-answered
51. IDC's Future of Work - Automation as a Force for Good White Paper

Automation can help fight the Great Resignation

73% percent of global respondents (and 85% of business leaders) surveyed in the UiPath [2022 Executive Survey][52] agree that incorporating automation may support their organization to attract new and retain existing talent.

In December 2021, over 4.3 million workers were estimated to leave their jobs in the U.S., bringing the year's total to 47.4 million. According to a recent Federal Reserve study of chief financial officers, "33 percent of businesses are using or exploring automation as a result of their hiring issues". Employees who are burned out are more likely to leave their company. The adoption of automation services should foresee improvements in operational performance, with supportive leadership and a consistent automation deployment inside a company. Covid-19 has changed employees' perceptions of work and corporate leadership, looking for more flexibility: over 11 million jobs remain unfilled, and over 74% of businesses have trouble filling open positions.

Office workers believe automation is core to improving their job performance and satisfaction: consistent with UiPath Office Worker Surveys in 2021 and 2020, employees feel like much of their workday is eaten up by tasks that can be automated (57% of global respondents and 67% of the Americans feel this way). In addition, 91% of global respondents believe that automation can improve their job performance, namely by saving time (52%), increasing productivity (46%), and creating opportunities to focus on more important work (45%). Seventy-one percent agree they can focus on more creative work with the help of automation.

Artificial intelligence provides economic opportunities thanks to productivity gains (lower costs due to operations automation, improvement of coordination processes, production flow optimization, etc.) and the new markets it may create. Also, AI is a societal opportunity: processing enormous data generated by connected devices could lead to new professions as data scientists, AI programmers, and others, as well as better working conditions when eliminating repetitive tasks by replacing them with automation.

Several scholars have proposed that artificial intelligence-based technologies will massively automate existing jobs, potentially up to 47% of all jobs. However, this high proportion may be partly explained by the fact that the researchers in question reasoned by profession instead by task. All the tasks that make up a job, their nature, and their integration into the way labor is organized should be considered when assessing the risk of a job becoming automated. Automating a few jobs is insufficient to determine the likelihood of an entire profession becoming mechanized. Other academics have estimated the probability of automation to be between 10% and 15% when looking at tasks rather than professions. These analyses conducted in the past (2016-2018) solely considered the potential for job loss, ignoring that technology is only one of the forces driving transformation and that it will also result in the creation of new jobs.

Automation moves the task content of production towards labor, but introducing new jobs in which work has a comparative advantage increases via the reinstatement effect. Automation reduces the labor share of output and may minimize labor demand, whereas additional workloads always increase labor share. Daron Acemoglu and Pascual Restrepo discovered that workers affected by automation are frequently pressed to compete with other workers for the few remaining jobs. Workers who lost their jobs due to automation will probably seek employment in industries that have not been automated.

Another scenario sees AI as a threat to employment and a vector for aggravation of inequalities and social polarization, with the almost inevitable disappearance of whole realms of activity in many sectors (industry, banking, finance, trade, etc.) and various professions such as lawyers, auditors, physicians, etc.

Although there are studies[53] positing that integrating technology in a particular profession leads to an increase in salaries, there are no analyses on the overall societal effects of automation on wages, with granular wage detailing. Therefore, a new perspective must be added: the preference for automation, as a cost-optimizer, to the detriment of labor or new task creation. However, poverty reduction is directly linked to wage growth and productivity growth. Companies must integrate their innovative capabilities (as per the usage of new techs, such as AI or automation) with the context of demographic changes and the supply of new skills, competitive forces, and governmental policies for innovation and R&D.

52. Robotic Process Automation vs The Great Resignation – 1:0 https://www.enterpriserpa.co.uk/post/robotic-process-automation-vs-the-great-resignation-1-0
53. According to economic historian James Bessen, technical advancement has resulted in a 10-fold increase in wages over the last two centuries. New technology, according to Bessen, is to blame for many regular workers' salary increases.

Lastly, when talking about automation and the shifts in the labor market, one must refer to the direct usage of technology in HR departments of companies. As the Great Resignation shows no signs of slowing down, recruiters are searching for all the support they can get to replenish their headcounts with qualified personnel. The HR market values $20 billion, including talent acquisition software and services. On the strength of growing digitization and automation of recruiting and HR activities, the HRM industry is predicted to develop at over 12% annually until 2028. Applicant sourcing, screening, diversity, and other HR activities can benefit from AI-based solutions that collect and process candidate data.

Recruiting automation is technology delivered as software-as-a-service (SaaS) apps and increasingly powered by AI. It aims to automate recruiting tasks and workflows, reduce cost per hire, increase the productivity of HR personnel and recruiters, accelerate filling vacant posts, and bias-free hiring, improving the company's overall talent profile.

According to an Entelo survey, 4 of 5 recruiters believe automating applicant sourcing would enhance efficiency. More data, they agreed, would help them screen prospects, evaluate candidate pools, improve outreach, and perfect hiring operations. AI-based intelligent solutions can gather essential data about applicants, make it available to recruiters, and then accurately analyze it to speed up and streamline several sub-processes, such as candidate sourcing, screening, diversity and inclusion, interviews, and applicant tracking.
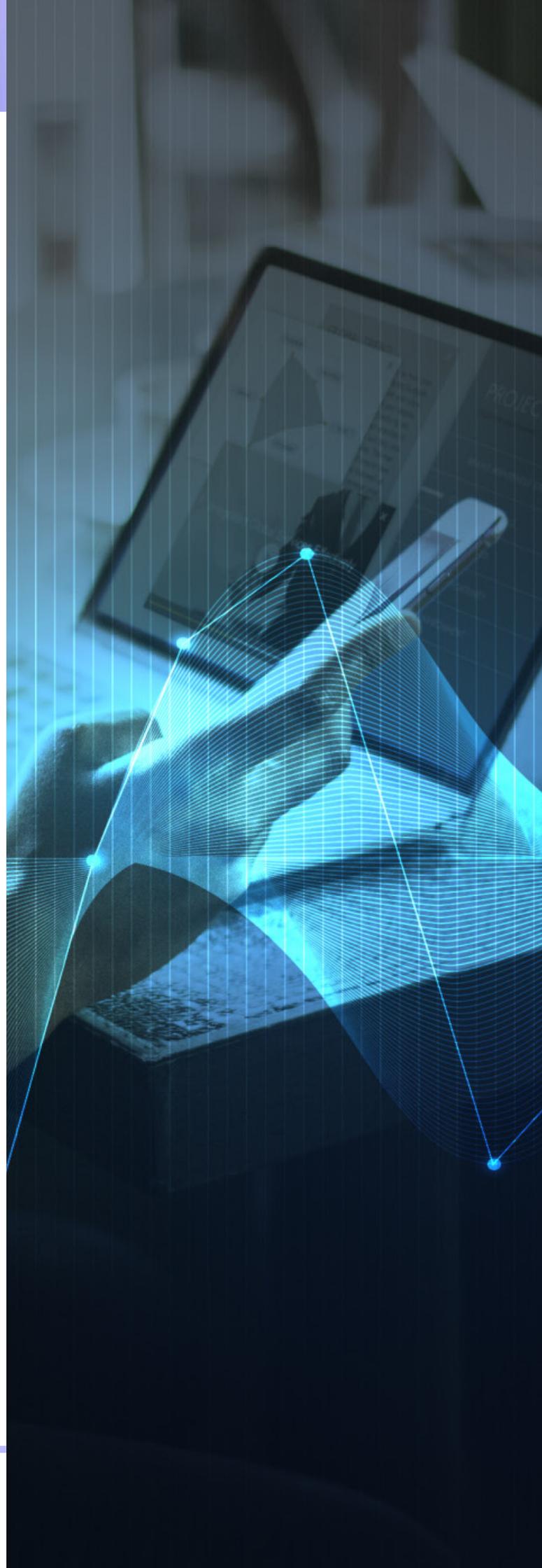
Better manufacturing and the circular economy

A better supply chain, encompassing ethical principles and circular economy mechanisms, is necessary to tackle waste and mitigate the environmental impact of current production. The software will undoubtedly play a large part in the development of process automation and will be the main factor over the next decade. Implementing cutting-edge software should be a goal for all businesses, from SMEs to major companies. Manufacturers should concentrate on carefully adopting RPA, focusing on scalable platforms that are simple to comprehend and use.

Technology takes part in multiple facets of a business. Intelligent automation is the newest trend for a reason, and companies who incorporate it into their systems can only expect to succeed because the possibilities are unlimited. By integrating hyper automation[54] with new operational processes, companies will reduce operational expenses by 30% by 2024 according to Gartner's IT Automation Trends for 2022[55]. Many industries are implementing Augmented Reality and Virtual Reality solutions to bring more automation into the production cycle: AR/VR solutions have successfully raised workflow efficiencies on production floors, in equipment design rooms, in employee training, and virtual customer visits. Vertical integration trends demonstrate that data is a key tool for manufacturers. According to a 2017 IBM research, 90% of the data available at the time was created within the previous two years. Manufacturing processes are extracting an increasing amount of data, which provides essential information on quality, maintenance, and process improvement.

The manufacturing processes generate a lot of waste: In 2016, the global production of electronic garbage (e-waste) reached 45 million tonnes, where the raw material was worth EUR 55 billion. Only 20% of waste is collected and recycled correctly, which means that a large percentage of its value is never recovered. This situation creates a stringent need for the circular economy, remanufacturing, and waste management to reduce environmental impact.

AI can facilitate and accelerate the transition to a circular economy and contribute to all the SDGs, especially Goal 12: Responsible consumption and production and Goal 12: Climate Action. Because it enables treatability and management throughout the product lifecycle, AI has emerged as an essential tool in assuring product and process-based circularity. Interventions can be carried out using data from the purchase of materials to resource disposal or introduction into a new lifecycle. AI appears to have

much potential for facilitating the adoption of most circular manufacturing solutions at various scale levels.

AI technologies can be applied to three critical aspects of a circular economy: design circular products, components, and materials; operate circular business models (and reduce remanufacturing costs), and optimize infrastructure to ensure circular flows of products and materials (such as tackling technical issues of recycling). Access to relevant, high-quality data will be essential in developing AI applications for the circular economy, both to train algorithms and to use as input data.

54. The term "hyper automation" was coined by the research firm Gartner, which called it the number-one trend in strategic business technology in 2020.
55. Gartner's IT Automation Trends for 2022
| https://www.advsyscon.com/blog/gartner-it-automation/

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Examples for better manufacturing and the circular economy – the private sector perspective:

1. Caterpillar, MG Motor, and Meritor are working on an AI-driven robot system that inspects and disassembles returning equipment independently or semi-autonomously. Remanufacturing solutions could become a good business case in consumer electronics as AI, and robotic systems grow more technologically mature.

2. Humai, as explained in Artificial Intelligence and The Circular Economy (ElLen Macarthur Foundation) has made a tool called xRec that uses AI and computer vision to identify components or parts for machine maintenance automatically. This makes time-consuming tasks like reordering spare parts and accessing documentation much more manageable.

3. Refind Technologies (Sweden) develops systems for intelligent sorting and classifying e-waste: safer, faster, and higher quality sorting of e-waste. Increased capture rate and sorting quality generate additional cash from selling parts and materials.

*Refind allows businesses to recover the full value from (mixed) e-waste streams in two ways: 1. Improve overall recycling and refurbishment rates to reduce e-waste. 2. improved resale value by categorizing the product as suitable for refurbishing or recycling..

Examples for better manufacturing and the circular economy – the public sector perspective:

1. Helse Vest, a health authority in Norway has cut the number of letters it sends to patients with confirmed appointments. Instead, software robots intercepted each letter, preventing them from being printed and mailed. Helse Vest[56] was able to minimize its environmental footprint by using less paper with an expected savings of £400,000.

2. Automated Waste Collection Systems (AWCS) is a municipal solid waste management system transporting waste at high speed through underground pipes from the generation point (buildings) to sealed containers. Examples of providers of such technology: include MetroTaifun[57], which delivered the solution to more than 40 cities worldwide, such as Sluisbuurt - a new neighborhood in Amsterdam, the Netherlands, or Stockholm's Haga Norra.

3. Preventing Plastic Pollution program in Plymouth (UK): using remote-operated vehicles (ROVs) to "gobble up" plastic garbage in the sea. The Waste Shark technology could act autonomously, using Artificial Intelligence, and move around the water to identify where the plastic waste is accumulating. All Waste Shark project partners are working to reduce plastic pollution and contribute positively to Plymouth City Council's Climate Emergency Action Plan.

56. Helse Vest deployed robotic process automation (RPA) to reduce the administrative burden on its doctors and nurses, allowing them to spend more time with patients. https://www.uipath.com/resources/automation-case-studies/helse-vest-healthcare-rpa
57. Selected References - MetroTaifun https://metrotaifun.com/automatic_solid_waste_collection_system/en/references/selected-references.html

Sustainable and Inclusive Finance

The financial system is one of the most suitable for automation, with its high degree of digitization. Its reliance on technology, from using it for high-speed trading to generating new financial instruments, leads to "born-in-tech" financial companies with already integrated automated processes. The linkage to the "for good" aspect of our analysis comes from the concepts of inclusive finance (allowing for universal access at a reasonable cost to financial services), social finance (issuance of social bonds[58]), or green finance (financial activity created to ensure a better environmental outcome).

Many insurance companies still rely on legacy systems and manual processes. Lack of digitization due to the manual nature of the insurance industry and its underlying processes, data complexity, third-party involvement, and understanding of the context/nuances of a given request are some of the challenges experienced by insurance companies while adopting automation. Intelligent Automation could answer all of the industry's difficulties in adopting a digital-first mindset. The usage of automation will save time and effort while drastically lowering the risk of error. Benefits of adopting automation: advanced business quote intake, medical/physical assessment, payment processing, auto claims, real-time damage assessment & repair estimate, disaster analysis appraisal, data insights, predictions, & evaluations, and optimized contact center support.

Using automated processes to increase affordability for financial services, reducing client on-boarding time (even for clients with limited alphabetization levels), to process requests for loan repayment for clients under duress are some of the usages of automation for finance. But perhaps the most critical aspect is the possibility of automated data analysis for companies that must comply with Sustainable Development Goals under an environmental, social, and governance (ESG) framework. Traceability of information and aggregation in reporting lead to better decision-making for reaching SDG goals.

Examples of using automation in banking and finance:

1. Keybank[59] implemented RPA to boost efficiency by automating account receivables, which included several steps of repetitive procedures like drafting invoices and POs. Even though the bank's primary focus is usually payments, accounts receivable automation makes the payment process simple and error-free from beginning to end.

2. Zurich Insurance is present in different countries across the globe. Their biggest challenge is geography-specific regulations. RPA implementation helped segregate the common and general policies generated through an automatic robotic process saving time better used to review more complex procedures. The result was unexpected: 50% of the processing cost and saved time.

3. Ikano Bank[60] delivers finance on fair terms to businesses and individuals across Sweden, Denmark, Finland, Norway, the UK, Poland, Germany, and Austria. Automation was initially explored by IT and finance for 18 months. It swiftly identified 15 low-hanging procedures and built and deployed all bots in less than six months. After automating over 150 processes in the last year and saving over one hundred thousand hours of work since its inception, Ikano Bank aims to implement automation to every corner of its operations.

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58. Social Bonds refer to bonds that are issued by companies, funds, governments, and other entities for funding social projects. (IIF)
59. How to Use RPA in Finance? Use Cases & Real World Examples | Keybank, Zurich Insurance https://appinventiv.com/blog/rpa-in-finance/
60. Putting people at the center of Ikano Bank with automation | UiPath https://www.uipath.com/resources/automation-case-studies/ikano-bank-puts-people-at-the-center-with-automation

AUTOMATION FOR GOOD - FORMAL COMMUNITIES

The impact of automation on formal communities – humans in society and the support brought by automation in the public sector

Linked to Sustainable Development Goals 10 (Reduced Inequality), 13 (Climate Action), and 16 (Peace and Justice Strong Institutions), we refer to the impact of automation on formal communities. These formal communities may be local or national, but they have a commonality – may that be citizenship, location, or preference. They are formalized, therefore, subject to centralized policies (even if democratically decided upon). Lastly, their essential goal is resilience by coexisting and limiting their impact on the environment. Therefore, in this section, we focus on the impact of automation on processes occurring between individuals and communities (for instance, governments and NGOs) to increase that resilience and, ultimately, reach the SDGs, which would translate to Automation for Good.

A concern in this respect: According to Nature Communication research, AI applications are currently biased towards SDG issues that are mainly relevant to those nations where most AI researchers live and work. For instance, many systems applying AI technologies to agriculture, e.g., to automate

harvesting or optimize its timing, are located within wealthy nations. The existing literature search resulted in only a handful of examples of AI technologies applied to SDG-related issues in nations without strong AI research. Moreover, if AI technologies are designed and developed for technologically advanced environments, they have the potential to exacerbate problems in less wealthy nations (e.g., when it comes to food production). This finding is a substantial concern that developments in AI technologies could increase inequalities between and within countries in ways that counteract the overall purpose of the SDGs.

Solution for this situation? Designing and developing automation solutions that respond to localized problems in less wealthy nations and regions. Projects undertaking such work should ensure that solutions are not simply transferred from technology-intensive countries. Instead, they should be developed based on a deep understanding of the respective region or culture to increase the likelihood of adoption and success.

Better governments – increasing public sector effectiveness

The governments are implementing automation processes to streamline interaction with citizens, from increasing accessibility and transparency of the services they provide to reducing costs or improving "customer satisfaction." An efficient interface of the local or national authority enhances trust and reputation and, ultimately, allows for the government to be in the service of citizens properly. Steps are being taken, as statistics show. In 2021, according to Gartner[61], 19% of government respondents were using robotic process automation (RPA). Another 33% said they plan to use RPA within the next two years. The adoption of RPA arises mostly from the operational efficiency it provides, its ability to give advantages fast, and its application in automating legacy system activities. According to Gartner, by 2024, 75% of governments will have launched or are in the process of launching at least three

hyper-automation programs, and RPA is an important component of the digitisation path.

Gartner predicts that by 2024: 75% of governments will have at least three hyper-automation initiatives launched or underway, and RPA is a critical part of the digitalisation journey. On a similar note, Forrester[62] predicts for the public sector in 2022 that "one-third of global civil servants will become permanent hybrid workers," and RPA will execute 10% of the government administrative workload. There are three ways to highlight the true potential of RPA in the government, as per Gartner[63]: 1. Adopt a structured approach to automation that reviews processes and identifies a roadmap. 2. Establish a shared automation Center of Excellence (CoE) that includes RPA. 3. Pilot RPA on straightforward tasks with a clear return of investment (ROI).

61. How Government CIOs Can Realize the True Potential of Robotic Process Automation
https://www.gartner.com/en/articles/3-ways-for-government-cios-to-realize-the-true-potential-of-robotic-process-automation
62. Predictions 2022: The Global Public Sector Will Transform Itself — And Society | Forester https://www.forrester.com/blogs/predictions-2022-global-public-sector-digital-transformation/
63. How Government CIOs Can Realize the True Potential of Robotic Process Automation | Robert Snow | Gartner (February 2022)

Effectiveness and responsiveness

To provide better and more inclusive public services, governments worldwide must guarantee that institutions, policies, processes, and services are accessible, responsible, and responsive to all parts of society.

Robotic process automation can provide the most immediate benefits in the public sector as it implies software robots that can complete jobs with the same tools as human workers. Automation eliminates errors and re-work, creating more impact with critical services. Chatbots can handle consumer interactions using natural language processing, improving with each session. Beyond the overarching goal of increasing productivity, public

administration may see benefits in the following areas: Next-generation workforce, Improved services offered to citizens, Key back-office processes, Migration to the cloud, and Scaling.

Automation can help public officials deal with vulnerable and at-risk citizens and quickly distinguish the level of risk associated with each reported incident. In addition to saving time, automation allows the relevant bodies to respond more quickly to the people most at risk, ultimately improving the quality of operations and contributing to the achievement of targets related to the goals 3 (Good Health and Well-being) and 10 (Reduced Inequality).

Increased transparency

There are two sections in which governments may improve by implementing automation: streamlining administrative procedures and optimizing governmental processes.

The former refers to the nuts and bolts of public administration institutions[64]. They have, like any organization, the need to operationalize payroll and finance services, HR and recruitment, procurement, or help desks. These aspects are no different from deployment to a private company, but increasing their efficiency and transparency, and most importantly, decreasing the costs associated with generating a lighter public burden to contributors. In this area, the government may use automation for data digitization[65] or migration between legacy systems to a more operationalized (even cloud-based) platform.

The latter refers to registration, grants management, compliance validation, and application processing, which may lead to better usage of governmental funding and, ultimately, to the more effective and impactful deployment of funds. In this area, automation may be used for communication with the public (i.e., via chatbots), public opinion analysis (see here the example of the DEFT - Deep Exploration and Filtering of Text project[66] by DARPA), calendaring and scheduling (including for institutions such as courts in the judicial system) or public security (which may also be a sensitive topic as previously mentioned).

Data transparency is increased as a digital record of applications, approvals, payments, and permits are automatically stored.

64. The Nuts and Bolts of Administrative Action in an Information Age | Request PDF | Klaus Lenk | Research Gate (2012)
65. According to McKinsey & Company, government digitization, using current technology could generate over $1 trillion annually worldwide | Digital by default: A guide to transforming government - McKinsey | https://www.mckinsey.com/~/media/mckinsey/industries/pub-lic%20and%20social%20sector/our%20insights/transforming%20government%20through%20digitization/digital-by-default-a-guide-to-transforming-government-final.pdf
66. https://www.darpa.mil/program/deep-exploration-and-filtering-of-text

Improved resilience

Automation is having a significant impact on the economic sector, and this should be in the focus of governments and the public sector all over the world. When it comes to fostering resilience, governments must embrace methods for providing citizen-centric services in a timely and effective manner. During COVID-19 crisis many public sector workforces were overburdened as a result, from hospitals to civil servants. Governments can secure critical infrastructure with security and data privacy that allows them to reliably provide automated services.

Automation can help governments achieve their targets related to Goal 3: Good Health and Well-being, Goal 8: Decent Work and Economic Growth, especially important in the post-pandemic recovery process and Goal 9: Industry, Innovation and Infrastructure.

In 2020, in the beginning of pandemic, a quarter of UK employees were covered by the wage subsidy programme[67] and each individual was accompanied by a lengthy application process managed and monitored by government employees. During a crisis, people rely on local governments not only for financial assistance, but also for human touch. Analyzing this today, the deployment of digital labor is what will always allow local governments to run more efficiently and help government employees focus on the well-being of their communities even more.

There are four key actions to amplify digital gains and resilience in Government, according to Gartner: operating workloads using hyperscalers, creating synergies between different experience disciplines, launching hyper automation initiatives, and using AI and data for real-time decision making.

Improved efficiency

In 2021, the White House requested $92.1 billion in IT investment from Congress to increase AI, automation, and robotic process automation. RPA bots[68] can help governments handle repetitive activities, reduce manual errors, and increase compliance.

67. https://www.bbc.com/news/business-52634759
68. Top 7 Uses & Challenges of RPA in the Government in 2022 https://research.aimultiple.com/rpa-government/

Examples of using automation for better governments – increasing public sector effectiveness:

1. Automation plan for child adoption processes: Adoption is the process of matching a child with a family and finalizing adoption can take years. Procedures, notably the adoption application process, take a substantial amount of time and can be reduced by automation[69], with less paperwork that can also be input into current legacy systems. In the United States of America, an agency has been recognized for reducing the cycle time for adoption agency authorization by more than a year. The team cut the procedure from 730 days to the current average of 255 days.

**2. The National Shared Service Center (NSSC) of the National Aeronautics and Space Administration (NASA)** launched the first RPA program in the public sector in April 2017. In The State of Federal RPA report[70], The General Services Administration (GSA) noted that technology saved government agencies around 850,000 hours in 2020 and that its approach to RPA is rapidly maturing. The U.S. Department of Agriculture's Office of the Chief Information Officer has created automated systems that are used throughout the government. The attention on unsupervised bots has enhanced efficiency and security, resulting in 2,500 hours saved per bot. Many public sector organizations can leverage RPA implementation to offset an aging and retiring workforce.

3. The Department of Work and Pensions (DWP), the largest government department in the United Kingdom, is using automation to streamline various processes within its organization. With automation, DWP was able to clear a backlog of 30,000 claims in less than two weeks.

4. The Health Service Executive (HSE) in Ireland has its own RPA Center of Excellence. The CoE is designed to identify opportunities for automation across thee public health sector in the country. Use cases range from HR, to finance and health protection.
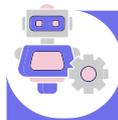
Robotic Process Automation can tackle societal issues[71] that have been difficult to address.

Intelligent Automation book provides 500 use cases and insights on how RPA combined with artificial intelligence and machine learning can improve society: managing immigration, promoting citizen safety and security, managing stakeholder services and expectations, improving education, addressing climate change and ecology, managing infrastructure, simplifying tax collection and improving organizational staff morale. The majority of the use cases provided by Pascal Bornet in his book show that RPA already brings solutions to deliver the UN's SDG goals, and to only name a few Goal 4: Quality Education, Goal 16: Peace, Justice and Strong Institutions to Goal 17: Partnerships for the Goals.

69. How Automation Could Be Used to Improve Child Adoption Processes | Don Horan (2021) https://www.uipath.com/blog/industry-solutions/how-automation-could-improve-foster-to-adoption-process
70. The State of Federal RPA Report | Digital.gov https://digital.gov/pdf/state-of-federal-rpa.pdf
71. The Promise of Robotic Process Automation for the Public Sector | SCHAR School of Policy and Government https://cbce.gmu.edu/wp-content/uploads/2021/06/The-Promise-of-RPA-For-The-Public-Sector.pdf

Better NGOs – increasing effectiveness in non-profit organizations

Before welfare was acknowledged as the responsibility of all stakeholders, not just governments, the conversation about the reduction of poverty (Goal 1), clean water (Goal 6), zero hunger (Goal 2), climate action (Goal 13), or injustice (Goal 16) relied almost solely on the shoulders of non-profit organizations. Regardless of their size, their "business model" was often focused on non-monetary impact and less on streamlining processes.

However, NGOs may benefit from automation in various forms:

for their financial management: increasing application processing capacity and funding deployment, improving transparency and financial visibility, consolidating financial statements, managing multiple currencies flows[72]

for their interaction with the public and with beneficiaries in donation and grant[73] management, pledge, or marketing campaigns

for their interaction with volunteers in "recruitment" (with a similar process as for-profit organizations)

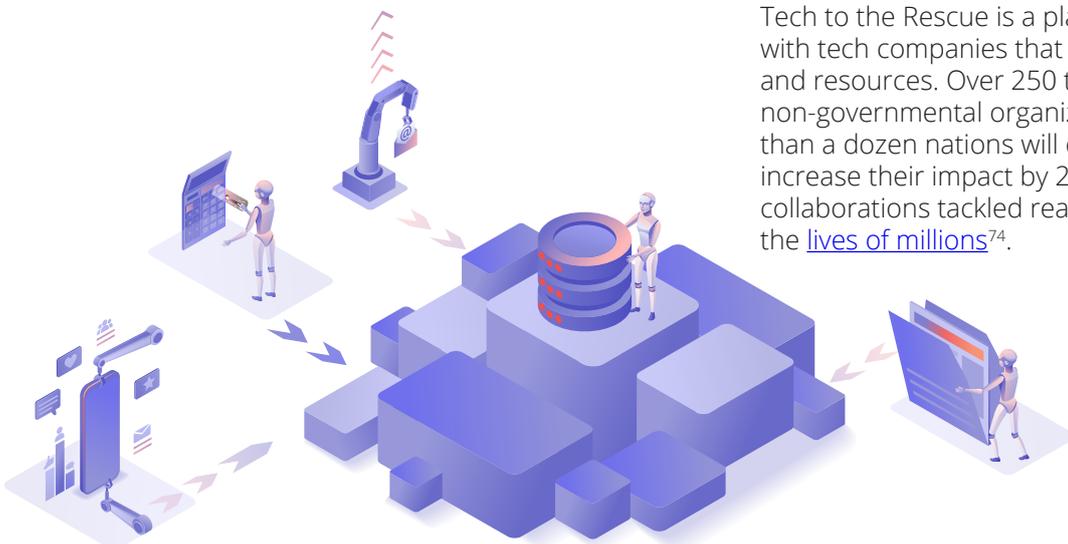for regulatory and/or mandatory reporting.

The non profit sector can greatly benefit from leveraging automation to optimize internal procedures, expanding capacity and improving operations to speed reaching their goals.

Typically, NGOs lack the necessary human resources and technological capabilities to commit to projects such as automation. And they also do not have the funding to approach the new digital technologies. But, around the world, corporations with thousands of people engaging in digital transformation and teams of 100 or 200 RPA developers within their IT department would occasionally have employees willing to donate their time and use their technological knowledge to help NGOs automate themselves.

Employees' willingness to volunteer their time and skills to support nonprofits can be very valuable for communities, and as several studies revealed, promoting a culture of employee volunteering improves employee morale and helps attract and retain top talent. This type of volunteering is known as "skills-based volunteering" and it can be done remotely.

Moreover, companies with employees participating in such volunteering activities (for example, Orange) acknowledged that not only their ESG mission was achieved, but also, that the volunteering contributed to the evolution of an entire organization - the partner NGO. Therefore, a successful CSR program that includes skills-based volunteering does not only result in the well-being of the company's employees, but also has benefits for the NGO's employees and its overall succes.

Tech to the Rescue is a platform that connects NGOs with tech companies that are able to volunteer time and resources. Over 250 tech companies and 300 non-governmental organizations (NGOs) in more than a dozen nations will employ technology to increase their impact by 2022. Over 50 pro bono collaborations tackled real-world issues to improve the lives of millions[74].

72. How 3 NGOs Automated Global Consolidations for Greater Efficiency and Insight - Humentum | Examples such as Vitamin Angels, Room to Read and the White Ribbon Alliance as mentioned as best practice in Humentum's blog post on the topic https://humentum.org/blog-media/how-3-ngos-automated-global-consolidations-for-greater-efficiency-and-insight/
73. Of particular relevance the grant management optimization by using RPA of the National Trust – the largest charity in UK: https://1spatial.com/media/hhzlsq4m/1spatial_national-trust_casestudy.pdf
74. Case studies | https://techtotherescue-org.webflow.io/case-studies

Examples of using automation to help accelerate the mission of NGOs:

1. Tricity Food Bank[75]**,** for example, which delivers emergency food to needy citizens, was searching for assistance in handling supplier and beneficiary data and building a CRM system. Tech To The Rescue teamed up with Objectivity, whose staff swiftly got to work on developing a solution.

2. Sensing Clues Foundation[76] is a Dutch NGO supporting nature conservation professions with automated, data-driven solutions to protect nature. Their automated image recognition of wildlife (including via sensors) may be used for alerting rangers of possible risks and enhancing report capacity.

3. Takecarebnb[77] - The first "digital volunteer" deployed in March 2022[78]: Tacstone Technology and Takecarebnb used free UiPath software licenses and added automation value to the organization that managed to handle applications fast and error-free. When the war started, Takecarebnb, in cooperation with the Red Cross, took care of hosting thousands of Ukrainian refugees in the Netherlands.

4. The Good Food Institute (GFI)[79] is a nonprofit working internationally to accelerate alternative protein innovation. Its ultimate goal is to mitigate the environmental impact of our food system. GFI also aims to reduce risks to public health and ultimately feed a greater number of people with fewer resources. These objectives are aligned with Goal 2 (Zero Hunger), Goal 3 (Good Health and Well-being) and Goal 12 (Responsible Consumption and Production) and the help received provides tools to reach its purpose. GFI is still in the start-up stage in Europe and is trying to scale quickly, so the website is crucial in attracting much-needed new talent. One of the most powerful features of the website is the ability to host job offers.

5. ProVeg International[80] is a food awareness organization that helps companies and links them with global partners in order to promote plant-based and cultured-food innovation. The organization had a large amount of data that it was using to compute impact, but it wasn't displayed in a user-friendly format, being difficult to incorporate data into external projects, share it with partners, and ultimately use it to create engagement and awareness. Silevis has helped ProVeg create a calculator that would immediately indicate the impact of replacing meat-based meals with plant-based food.

75. Tri-City Volunteers | https://www.tri-cityvolunteers.org/
76. Wildlife Intelligence | Turn wild spaces into safe havens | https://sensingclues.org/
77. Takecarebnb gets help from a 'digital volunteer' | Tacstone RPA https://www.technology.tacstone.nl/takecarebnb-gets-help-from-a-digital-volunteer/
78. Free Software Licenses to Launch a Digital Volunteer Helping in Hosting Ukrainian Refugees in The Netherlands
| RPA Master https://rpamaster.com/uipath-has-provided-free-software-licenses-to-launch-a-digital-volunteer-helping-in-hosting-ukrainian-refugees-in-the-netherlands/
79. Good Food Institute | https://gfi.org/
80. ProVeg International https://techtotherescue-org.webflow.io/case-studies/proveg-a-calculator-to-show-the-impact-of-plant-based-innovation

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AUTOMATION FOR GOOD IN 2030 – TRENDS INSTEAD OF CONCLUSION

When talking about Automation for Good, there cannot be a conclusion, which, as the name says, refers to an ending, but rather an overview of potential trends, as we are in the first steps of an arduous journey.

The evolution of RPA in the following years is expected to be even more exponential than prior, boosted by the upward digitalization trend.

The pace of automation is accelerating, with more organizations creating fully automated value chains. By 2023, voice, mobile app, and/or other user-experience-driven automation will have replaced the attended form of RPA.

From the extensive literature review conducted in this analysis, we have identified a series of technology trends that may align with the automation for good desideration.

1. Traceability in interactions between individuals and products, services, organizations, and governments. Allowing for proper traceability of resources permits fair trade, empowers local communities, and reduces the probability of inequalities in profit distribution in the value chain (Goal 8 - Decent Work and Economic Growth and Goal 10 - Reduced Inequalities). Also, the traceability of interactions between a person and local or central government limits the risks of fraud, identity theft, and money laundering, provided the monitoring respects human and privacy rights. Worldwide, more than 1 billion people[81] without proof of identity are excluded from decent living. Credentialing in an automated process may prove to be impossible for a person without an identity[82].

2. Creating standards for Validating trusted entities (including non-person entities) is a crucial step toward automation becoming mainstream. Although not directly related to the "for good" aspect, this element is essential for further implementing "for good" initiatives.

3. The growing concern for cybersecurity is brought to everyone's discussion, especially in IT circles, and IT budgets. But "automation security" is different from "security automation" and is going to be in focus more and more in the near future. Automation security refers to ensuring the security of the automation itself. Organizations should explore automation and automated reactions to cyberattacks: defense capabilities, such as security operations center (SOC), countermeasures, labor-intensive processes, such as identity and access management (IAM) will be important in the adoption of automation.

4. More robots (hardware and software) will be used in business and government. Provided this trend is adjusted with the ethical concerns previously mentioned and keeping in mind the ultimate goal of the SGDs, the pitfalls of such a deployment may be mitigated.

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81. Helping the 1 Billion People Without Proof of Identity | Veriff https://www.veriff.com/blog/digital-citizenship-identity
82. Exclusion and identity: life without ID | Privacy International https://privacyinternational.org/long-read/2544/exclusion-and-identity-life-without-id

34

5. Considering non-monetary impacts in the [utility functions](#)[83] of multi-agent systems. A more theoretical and niche approach talks about the algorithms used in automation.

6. Increase in interfacing between legacy systems and new (even cloud-based) systems- building upon digitalization trends and decreasing costs.

7. The "[woke](#)"[84] [corporate](#)[85] - A movement in firms toward automation-centric cultures that emphasize the individual's benefits and proposed risk-mitigation strategies. Well-being of the individual (employee and client) should be central to the company's strategy. As a result, automation is viewed as a blessing rather than a curse. Software like [CultureX8](#)[6] software can measure and change workplace culture to make it less toxic and more positive for employees' health and well-being.

8. The need for an integration of fragmented initiatives towards [providing real value](#)[87]. Automation generates value directly (through profit – with increased efficiency; through volume – with an increased number of tasks performed; through safeguard – with a better service level) and indirectly (through development, innovation, and scouting for alternative / external resources). These separate branches must converge in a frame that looks at and addresses societal complexity.

9. Automation as a career booster, not a destroyer. People with the right mix of skills are needed to implement and manage the various tools and technologies that underpin modern software development.

10. Cobotting addressing inclusion, an important workplace stressor. A strong and proactive approach to diversity and inclusion promotes employee performance and job satisfaction. Automation and machine learning can benefit employees of all ages and backgrounds.

Ultimately, Automation for Good is automation for the people. Although it can help with many aspects of the data analytics stack, human intelligence is still indispensable. Several activities cannot or should not be transferred to machines: asking questions, evaluating data or statistical models, and converting figures and graphs into actionable knowledge.

Automation for good is no different than science for good. As Vannevar Bush ended his famous 1945 op-ed in the Atlantic Monthly, "[As We May Think](#)"[88]:

The applications of science have built man a well-supplied house, and are teaching him to live healthily therein. They have enabled him to throw masses of people against one another with cruel weapons. [..] Yet, in the application of science to the needs and desires of man, it would seem to be a singularly unfortunate stage at which to terminate the process, or to lose hope as to the outcome."

83. Full length article Utility and mechanism design in multi-agent systems: An overview | 2022 https://www.sciencedirect.com/science/article/pii/S1367578822000062
84. Woke Corporate Capitalism | The Heritage Foundation https://www.heritage.org/progressivism/heritage-explains/woke-corporate-capitalism
85. "Woke" Corporations and the Stigmatization of Corporate Social Initiatives | Business Ethics Quarterly | Cambridge Core | 2022 https://www.cambridge.org/core/journals/business-ethics-quarterly/article/abs/woke-corporations-and-the-stigmatization-of-corporate-social-initiatives/155E98E5D7AAE62D67BFCDACF151666C
86. CultureX uses data and cutting-edge insights to improve employee engagement and business results https://www.culturex.com/
87. Ratia, M., Myllärniemi, J., & Helander, N. (2018, October). Robotic process automation-creating value by digitalizing work in the private healthcare?. In Proceedings of the 22nd International Academic Mindtrek Conference (pp. 222-227).
88. As We May Think - The Atlantic | Archive 1995 https://www.theatlantic.com/magazine/archive/1945/07/as-we-may-think/303881/

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For automation for good, **hope is just springing.**

Methods

Contributors A.M. and R.V.D conceptualized and composed the paper, as well as examined and studied the SDGs correlation with automation and RPA, in order to understand how automation may become a force for good and how it can be linked with the SDGs aims for a better world and a better future. In this study, we investigated and comprehended the relationship between automation and humans at different stages of interaction: (i) at home and school; (ii) at work; and (iii) in the community, to investigate and comprehend how automation can positively influence and contribute value to all of these stages. The role of automation in the private and public sectors is further examined.

E.D. reviewed sections of the paper; she also assessed and reviewed SDG correlation. A.P.S. supported the design.

Limitations

Based on the use cases and examples researched, this paper provides the authors' analyses on the subject. Around 200 materials and use cases were analyzed. Some studies on how automation might impact various SDGs may have been overlooked by the writers, or there may not yet be published evidence on such interaction and connection. The approaches and methods utilized aimed to reduce the subjectivity of the judgment.

Also, it must be remembered that fulfilling the SDG targets need a collaborative effort, and that automation may have only a minor impact on its own even when the transformational potential at the social level is evident.

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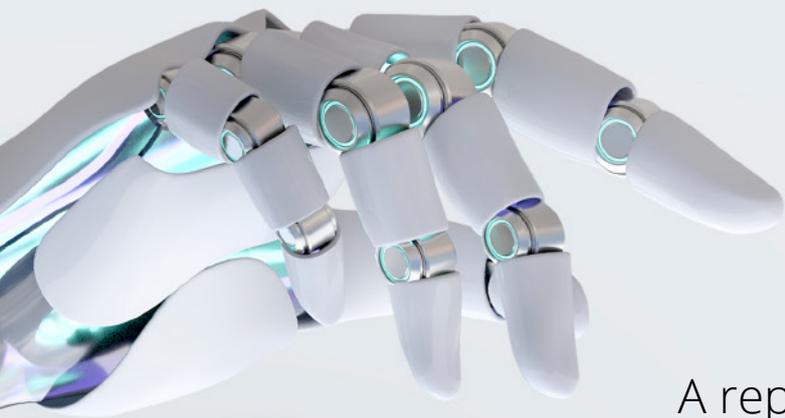
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