1 Introduction

The principal aim of this dissertation research is to investigate how advancing automation is affecting human work and to consider the ethical impact of this. Although, to date, the effect of automation has mainly been felt with regard to low-skilled manual jobs in the industrial sector, the advent of digitalization and digital transformation has led to the development of new technologies that offer increased potential for automation, even for high-skilled jobs. This inevitably means that a larger proportion of individuals participating in the labor market may be affected by automation, which in turn raises considerable uncertainty over workers' employment futures and how they might be able to maintain a stable income given their levels of education and skills. They could face increasing pressure in jobs in which technology is able to completely substitute them, while cost optimization opportunities for employers and capital holders simultaneously expand.

Advances in automation may lead to a generally lower demand for paid labor, which has the potential to result in reduced access to jobs for increasing numbers of individuals. This, consecutively, could lead to higher levels of unemployment. Moreover, if more individuals are excluded from the labor market, then both economic and social inequality will also increase. This effect could be exacerbated as higher productivity will no longer translate to wage increases in light of an oversupply of workers eager to perform the remaining jobs. In such contexts, a redistribution from labor to capital would occur. The consequences of the advancing automation of human labor give rise to certain ethical issues with regard to paid work, including in relation to potential violations of human dignity (e.g., having a lack of financial resources to lead a life with human dignity) or social justice (e.g., increasing levels of economic inequality). Furthermore, the use of automation technologies may lead to a decrease in the numbers of humans working in public services or communication, and this lack of a human presence in certain critical functions of society and democracy could affect individuals' political rights, when for example information on political processes are growingly biased. Moreover, it is becoming increasingly common for automation technologies to harvest the private data of humans, which contributes to highly profitable business models based on

an unremunerated work on selfhood, as in the case of individuals posting information about themselves on social media.

The need to assess these implications from an ethical perspective led to the development of the primary research question for this project: *What is the ethical evaluation of the change of human labor caused by advancing automation?* This project therefore seeks to investigate both the ethical challenges and the opportunities presented by the automation of labor. Correspondingly, certain policy instruments such as a universal basic income must also be evaluated with regard to the impacts of automation technologies. The thesis is structured as follows. First, the key terms are critically reviewed and defined, which is essential for conceptual clarity from an ethical perspective. Second, the ethical point of reference, namely the ability to live a life with human dignity, will be introduced, explained, and justified on the basis of the capabilities approach framework. Third, an ethical evaluation of human labor automation will be conducted, highlighting the opportunities and risks of human labor automation. This includes an assessment of policy instruments from an ethical perspective. The final section applies the insights gained from the research to Swiss public policy, providing a general outlook, as well as an ethical guidance for policy- and decision-makers.

1.1 Research structure

From a structural perspective, each chapter is defined by one or more specific guiding questions and objectives that reflect the chapters' respective focal topics. In this first, introductory chapter, the research topics and question are detailed, and the research methodology is introduced. The second chapter defines and examines this research's most salient terms from an ethical perspective: human labor will be defined in accordance with the current state of research along with the automation of human labor, encompassing the role and definition of digital transformation. Chapter Three identifies, explains, and justifies the selected ethical point of reference—namely, human dignity. In adopting the capabilities approach, it may claim universality from an ethical perspective (i.e., it is independent from any specific religion, culture, or worldview) by justifying the principle of human dignity as a moral value and presenting the central human capabilities required to live a dignified life as well as the role that human work plays in this pursuit. Furthermore, the relevant subcategories of a life with

human dignity in the context of the capabilities approach—for instance, social justice, identity, or meaningfulness of work—will be elaborated and will contribute to defining and revising the existing capabilities approach as necessary. Based on the ethical point of reference, Chapter Four will offer an ethical assessment of how human labor has changed as a result of developments in automation, evaluating relevant opportunities and challenges from an ethical perspective that is aligned with the capabilities approach. Policy instruments will also be analyzed from an ethical perspective. The final chapter, Chapter Five, offers an outlook for the future, as well as ethical guidance for Swiss public policy based on the preceding assessment. It will demonstrate how the findings of this research project can inform Swiss public policy from an ethical perspective in the context of ethical issues arising in relation to the increased automation of human labor.

1.2 Scientific relevance

Various publications have highlighted the need for additional and targeted research in the field of ethics that addresses advancing automation to fill a gap in ethical research. The field stands to gain from this research by virtue of its contemporary relevance in terms of expanded applicability to the latest technological developments by incorporating a normative ethical approach as a proven methodological framework. Specifically, the ethical assessment of the increased automation of human labor, guided by an ethically justified ethical point of reference that can claim universality and generalizability, represents an evolutionary next step that highlights the perennial importance of ethics, irrespective of the era in question.

Ethically relevant issues such as economic inequality or impaired labor market access, also warrant further exploration as potential byproducts of digital transformation and should be included in the wider scientific agenda. Moreover, automation technologies affect how humans exercise their political rights by means of their influence on the ways in which humans can communicate with one another. From an interdisciplinarity perspective, the project encompasses topics that are of direct relevance to other fields by offering new ethical insights pertaining to advancing automation—for instance, by providing ethical guidance for researchers in informatics or robotics so that they may design automation technologies that best serve society's needs. Moreover, given that ethics may be applied to critically examine legal obligations, this research will support the opti-

mization of legal frameworks that are relevant to the impact of human labor automation.

1.3 Societal and practical relevance

Ethical issues arising from the automation of human labor are increasingly posing social, commercial, political, and economic challenges. For instance, there is an increasing obligation to confront the possible outcomes for individuals who have been made redundant as a result of automation (e.g., by automated checkout systems in supermarkets or artificial intelligence (AI) chat bots) as well as the wider implications for society and the economy if individuals are increasingly deprived of the human dignity associated with employment. Moreover, automation technologies may affect the operation of the rule of law as robots increasingly take over the work typically performed by human public servants, whereby the biases of those who create such technologies may be played out by these robots, thereby violating individuals' dignity. This research project's findings will be of value to different institutions, including businesses, international organizations, and governments, as they shape their own values, which they cannot define themselves owing to potential conflicts of interest associated with their role as employers seeking primarily to minimize the costs of human labor (including the public sector's objective of reducing government spending). This research project thus has the potential to help bridge the gaps between science and society, between theory and practice.

In the context of human labor, in particular, ethical issues can negatively affect social peace and cohesion. Therefore, the results of the present study may help to prevent societal instability. In particular, the ethical guidance outlined for public policy could help policymakers to employ adequate instruments in the context of human labor automation.

1.4 Overview of the current state of research

Several academic disciplines are concerned with the ethical considerations arising from the increased automation of human labor owing to the advent of digital transformation: in the field of computer science, for instance,

Research Priorities for Robust and Beneficial Artificial Intelligence[1] have highlighted the requirement for both computer scientists and ethicists to develop sufficient expertise to ensure that these technologies are ethically beneficial for society. While automation technologies such as AI might increase humanity's wealth overall[2], they may also lead to further economic inequality in ways that are ethically problematic[3]. Similar research results have highlighted potential adverse effects, such as unemployment, and have called for labor market reforms (e.g., educational reforms, apprenticeship programs, social safety nets, minimum wage) in anticipation of further developments in labor automation[4]. Moreover, findings suggest that approximately 47 percent of employment in the United States is at risk, indicating that paid jobs may become increasingly scarce in the future[5]. Despite the dwindling availability of paid employment opportunities, however, automation may also positively benefit humans from an ethical standpoint by relieving them of the need to perform repetitive tasks[6], thereby reducing working hours for those who are employed[7], and boosting work satisfaction[8] by freeing up human workers to engage in more meaningful work[9]. In addition, it may reduce government spending, thereby alleviating the taxpayer's financial burden.

The capitalization effects of automation[10] can also promote the creation of new jobs or even completely new industry sectors, as newly gained capital from automated work increases the demand for new goods and services. Similarly, lack of automation and the availability of human providers could become a selling point in burgeoning labor-intensive service sectors[11]. To adapt to the future labor market and prevent unemployment, companies are called on to honor their social responsibility and take steps to upskill their employees, a call that has been widely supported in interdisciplinary

1 Russel et al. 2015: 106-109
2 Brynjolfsson/McAfee 2016
3 Brynjolfsson et al. 2014
4 Glaeser 2014: 75-80
5 Frey/Osborne 2017
6 Grace et al. 2018: 742; Makridakis 2017
7 Vermeulen et al. 2018
8 Ramamurthy 2021
9 Jajal 2018; Chui et al. 2015
10 Schwab 2016: 37-46
11 Lee 2016; Avent 2016

discourse[12] and by international organizations[13] and international actors[14]. Automation consistently heightens educational and on-the-job skill requirements, particularly for middle-class workers[15]. Were human labor to be rendered superfluous by automation, the potential for conflicts regarding the distribution of wealth in society is tremendous and highly relevant from an ethical standpoint. Further findings support the expectation that automation will lead to a rise in productivity and output accompanied by a fall in demand for labor, resulting in lower wages[16]. This would anticipate income redistribution from labor to capital, dividing automation "winners" (capital) and automation "losers" (workers). Workers who are unable to obtain the requisite extra education or skills to improve their chances of securing new, higher-paying jobs would be left behind and pressured to accept lower salaries—another ethical question that must be addressed. Firms might further drive labor automation by "fissuring", a practice whereby companies outsource full-time employment to independent outside contractors[17], circumventing workers' protection and weakening labor standards[18]. These ethical implications warrant detailed and dedicated analysis.

In terms of inequality, higher unemployment would likely widen the gap between the rich and poor in society, and scarcity of income tends to negatively impact human dignity[19]. To avoid such negative outcomes, the adoption of a human rights-based approach[20] to designing, developing, producing, and using automation technologies such as AI could help to address the ethical risks associated with digital transformation—particularly its core consequences of digital transformation and its associated ethical implications: ever fewer humans will directly participate in a more efficient and effective value chain[21]. Correspondingly, neither upskilling nor "downskilling" effects (whereby humans would simply do the remaining jobs

12 Kotsantonis/Serafeim 2020; Jesuthasan/Boudreau 2021; Panth/Maclean 2020
13 Soldi et al. 2016; OECD 2016; ILO 2020
14 WEF 2020
15 Autor 2015
16 Sachs 2019
17 Weil/Goldman 2016
18 Estlund 2017
19 Kirchschlaeger 2021
20 Kirchschlaeger 2021
21 Kirchschlaeger 2017

that have not been automated) should be considered as job creational[22], and the additional value derived from robotic labor benefits only a few, posing an issue regarding social justice. Similarly, skills and education do not necessarily need to serve as effective protection against job automation, given the rapid pace at which technology is advancing[23]. The negative social effects of unemployment have been thoroughly investigated[24], showcasing how an "unemployed identity" is often fraught with suffering caused by unhappiness, self-doubt, and isolation. In this context, conventional economic indicators, such as gross domestic product (GDP) per capita, might no longer be suitable for analyzing automation-based economies, as they fail to fully capture the benefits and costs of deploying these technologies[25]. Consequently, new metrics of societal well-being that consider social justice-related factors, such as inequality and insecurity, would be required[26]. Transparency regarding how the technology is used is also necessary[27] in terms of reducing biases which would be ethically beneficial. Another social justice issue concerns the power balance between capital holders and employees, as automation substantially diminishes the potency of strikes as a negotiation tool[28].

Several calls for legislative action[29] have aimed to determine where mandatory human decisions must be taken rather than allowing algorithms to decide, which would have a substantial impact on human labor. Moreover, one of the outlined "Three Pro-Human Laws of Robotics" states that "robots may replace human labor only to the extent that this is compatible with humans leading a meaningful life of dignity, culture and creative self-realization"[30].

Alternatively, the focus may be shifted to the technical governance of automation technologies, emphasizing the importance of human dignity as part of a conceptual governance solution for robots when human work is automated[31]. Similarly, robots could perhaps be equipped with moral deci-

22 Manzeschke 2019; Manzeschke/Brink 2020
23 Ford 2016
24 Hetschko et al. 2014
25 Mokyr 2014
26 Stiglitz 2020
27 Cath et al. 2018
28 Cimadamore et al. 2016
29 Krupiy 2020; Risse 2018
30 Thun-Hohenstein 2017: 29
31 Zardiashvili/Fosch-Villaronga 2020: 13

sion-making abilities[32]. This idea also relates to human work replacement in the healthcare sector, in which the importance of teaching robots to respect human individuals' autonomy has been acknowledged[33]. Human dignity is also identified as a key concept[34] in determining how technology should be applied in the working environment (e.g., upskilling, personal data access), which is particularly relevant in light of the extreme pressure on companies to adopt automation technologies in the interest of remaining competitive[35]. Various new approaches have been developed for the case of automation in the context of corporate social responsibility (CSR)[36]. Several accounts concede that the task of developing and controlling AI applications ultimately still requires human input and a sense of societal responsibility—for example, where the possibility that political rights will be impacted arises[37]. Corporate responsibility for algorithms may also be necessary in the deployment of new automation technologies that cause "technological unemployment"[38]. Aside from early discussions regarding the ethics of deploying robots in the virtual world[39], the current level of digital transformation is historically unprecedented: for the first time in human history, technological innovation has led not to the facilitation of human work but rather to a direct substitution[40], even of intellectual work, and automation is threatening the very identity of human beings[41]. This also impacts the role that humans play in work processes, whereby the presence of fewer humans in the value chain could increase the dependency on machines that operate without human supervision. The COVID-19 pandemic provided another unparalleled boost for digitalization, and several publications have explored how such extreme events can accelerate work automation[42].

As an outlook, practical ethical guidance for public policy based on the results of this research will be provided in the final chapter, with the aim

32 Wallach/Allen 2009
33 Beauchamp/Childress 2013; Vandemeulebroucke et al. 2018
34 Doolin/McLeod 2007: 156-173
35 Madakam et al. 2019
36 Sampath/Khargonekar 2018; Naqvi 2018; Hofstetter 2017; Lobschat et al. 2021
37 Borry/Getha-Taylor 2019; Clifton et. al 2020
38 Martin 2019
39 Ventimiglia 2001; Ventimiglia 2008
40 Kirchschlaeger 2021
41 Hessler 2016
42 Chernoff/Warman 2020; Yoo/Sedik 2021; Siderska 2021

of confronting ethical issues using concrete guidelines, complementing the current state of research[43] with a specific focus on Switzerland.

1.5 Methodological approach

For this research, an ethical evaluation will be conducted within the framework of the capabilities approach, which encompasses the notion of human dignity. This ethical point of reference and the corresponding methodological approach are introduced, explained, and justified in Chapter Three.

1.6 Literature and sources

The sources used in this research project primarily include academic publications, policy papers from relevant stakeholders or organizations, and existing codes of ethics. In general, academic literature is prioritized in terms of the weight of the respective arguments.

43 Boston et al. 2010; Russel et al. 2015; Mitcham 2015; Risse 2018