

# Benefits For Whom? A Systematic Literature Review Of Algorithmic Management In Digital Work Platforms

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## **Abstract**

Digital work platforms are increasingly more present in our society. Among the main elements of this algorithm-mediated economic model are companies (suppliers), consumers and workers. The aim of this study is to analyze the benefits of algorithmic management for each of those groups in digital work platforms. To that end, we conducted a systematic literature review with the initial sample of 873 publications from journals and international conferences. The results allowed us to identify the main benefits of digital platforms for each category. A direct implication of this study is the incentive for Academia to reflect on how algorithmic management affects work conditions.

**Keywords** Algorithmic Management; Benefits; Digital Work Platforms; Systematic Literature Review; Work Platforms; Work Conditions.

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## **I. Introduction**

The widespread use of the Internet and information and communication technology has profoundly revolutionized many aspects of contemporary society. It has spread across many sectors of society and significantly affects the way companies and individuals organize production and work, demonstrating that major technological changes are disruptive.

The development of application software and the use of algorithms to manage processes has changed work. On one hand, this emerging form of work has contributed to the substitution of repetitive and time-consuming tasks; on the other hand, it has led to a significant increase in mass layoffs in traditional job sectors.

Contemporary technological advances, notably exemplified by cloud computing services and the ubiquitous presence of algorithms, have inaugurated an unprecedented sphere of labor outsourcing. In this context, digital work platforms emerge, engendering the possibility for companies to engage professionals with a wide range of skills and specializations, transcendentally distributed across the globe. The labor aspect imbued by such platforms is the most recent materialization of the outsourcing of services, giving corporations the offer to adjust their workforce to achieve peculiar tasks, marked by contracts of an ephemeral nature (such as short-term, temporary, intermittent and hourly occupation). This new labor modality is intertwined with those verified in consumption dynamics, as well as with emerging needs in the social structure (Silva, Ziviane and Ghezzi, 2019).

Digital work platforms are managed through algorithms that are replacing human managers in the process of decision-making, control, monitoring, planning and organizing activities. They act as mediation for management to execute functions of control, monitoring, organization of labor, tasks assignments, feedback and even motivating employees (Derrick & Elson, 2019; Mateescu & Nguyen, 2019).

In addition, it is worth mentioning that digital platforms have made it possible to collaborate remotely, concomitantly with the simplification of algorithm-mediated management in labor procedures (Moore and Joyce 2020). Because they are a multifaceted market that enables the interchange between companies, clients and workers (United Nations Conference on Trade and Development, 2019).

The phenomenon known as algorithmic management (Lee et al., 2015) allows the creation of many opportunities of services for workers at local and global levels, through digital work platforms (Wood et al., 2019). These platforms use algorithms to interconnect workers with companies/suppliers and

clients, in a way that available labor is found in faster and less expensive ways. Indeed, the platforms also allow for faster offer-supply and client/consumer encounters, which use digital platforms to meet their consumption needs, and benefit all the involved in their own proportion (ILO, 2021; Rani & Furrer, 2021).

The transformation of labor structures resulting from algorithmic management in digital work platforms, along with the optimistic discourse it has engendered, calls for contemplation and analysis. One example is that the phenomenon suggests the increase in employability while producing questionable working conditions. Hence, the inevitable need to analyze the benefits generated by algorithmic management and who they belong to.

The present article aims to analyze the benefits of algorithmic management for each group involved with digital work platforms. To that end, we conducted a systematic literature review (SLR) that contributes to an overview of the current literature available on the theme. It also contributed to the creation and the establishment of a research field through reflections and new insights. Moreover, demonstrating this new management model has influenced the benefits offered to the groups involved with digital work platforms.

This research delves into three distinct groups of interest within digital platforms: the companies/suppliers, the consumers and the workers. The findings of this study expose pre-existing research perspectives, which investigate the spread of digital work platforms in various economic sectors, while emphasizing the prerogatives inherent to each grouping that uses such digital work platforms. In this context, the present review has the nature of contributing significantly to the expansion of discernment regarding how these platforms have challenged and reconfigured previously approved labor, consumer and business practices.

## **II. Systematic Literature Review**

The systematic literature review is a research method that provides a broad idea of the literature (Nawi et al., 2022). Conducting literature reviews means analyzing the publications of a certain area critically, to identify and to analyze applied theories, results, contexts and remaining gaps (Paul & Criado, 2020; Shaffril et al., 2021).

Snyder (2019) argues that SLR has received that name due to the systematic collection and organization of data on a specific subject. The author identified an increase in the number of SLRs in the field of Business in recent years. In the field of sharing economy, some reviews were conducted with different objectives in various areas (Agarwal & Steinmetz, 2019; Belezas & Daniel, 2022; Boar et al., 2020; Tushev et al., 2022; Yang & Xia, 2021). Regarding algorithmic management, Benlian et al. (2022) presented many research possibilities.

Boar et al. (2020) and Benlian et al. (2022) claim that sharing economy and algorithmic management are part of a relatively new research agenda with many possibilities for research. Hence, the inference that systematic literature reviews can map and produce favorable results for that agenda.

Among the factors cited by Shaffril et al. (2021) for conducting SLR are the formulation of a research question, the search strategies and the development of a protocol. The next sections present the study motivation, which generated the research problem and question, the search strategies used in the initial selection of the articles and, finally, the development of a protocol to define the inclusion and exclusion criteria, as well as the quality criteria. Protocols strengthen the validity and the reliability of the study, since they allow researchers to replicate the study faithfully. They also reinforce the systematic essence of the review.

### **The Motivations for the Study**

The paradigm of digital work platforms holds the promise of heightened economic efficiency, potentially transforming traditional labor structures and generating new opportunities for both workers and businesses, environmental benefits and economic growth. Digital apps or digital work apps in the field of transportation, delivery and hospitality are pioneers of what is now called the revolution of platform economy. According to the International Labour Organisation [ILO] (2021), despite the positive impact of information and communication technologies on economic factors, the changes in work relationships are also noteworthy, from the most flexible structures to the absence of formal contracts. For companies, the revolution of platform economy has marked the recent appearance and the wide adoption of digital work platforms, placing new challenges under intense debate in recent years.

The fragmentation of activities at the global or local level, depending on the nature of the platform, plays a major role in shaping the experiences of workers, businesses and consumers. Despite international risks, participation in digital work platforms provides financial gains and advantages to these segments of stakeholders (Berg, 2018; Lehdonvirta and Kässi, 2018).

An increase in on-line work placed in and delivered through digital platforms without formal contract is a relatively welcome phenomenon among experts in economic development (Allegretti et al., 2021). These platforms, considered the greatest global network of development, are promoting their potential to help human development.

Some of the most prominent digital work platforms, including Amazon, Uber, and Rappi, have framed their business models as revolutionary solutions to poverty, proposing that their services could uplift individuals from economic hardship (Harmon & Silberman, 2019). Generally speaking, it has been suggested that on-line work would benefit the global economy, increase the participation of workers and increase productivity (Khovanskaya et al., 2019).

This subject has also been discussed in Academia internationally, in fact, some researchers define practices of automation of organizations as algorithmic management, whereas different researches still associate it with the concept of algorithmic leadership is a topic yet to be fully explored in the context of organizational management (ILO, 2021). Because these are recent and emerging concepts, their meaning is not exactly clear. Hence, the need to understand the impact these platforms have generated on work, their relationship with companies/suppliers and consumers/clients.

It is important to provide an overview of the literature available on the subject to demonstrate the state of the art and to facilitate the creation and the establishment of that research field, giving it clear boundaries as well as clarifying uncertainties and correcting mistakes. Hence, the present SLR aims to analyze the benefits of algorithmic management for each group involved with digital work platforms. Consequently, the present SLR aims to answer the following research question: what are the benefits of algorithmic management for each group involved with digital work platforms?

Shaffril et al. (2021) argue that research questions for SLR need a good formulation, which demands a method. For the present study, we used the PICOC method suggested by Petticrew and Roberts (2006), which presents five guiding points: population, intervention, comparison, outcome and context. The application of the PICOC method is shown in Table 1.

**Table 1. The study elements and descriptions based on the PICOC method**

Population	Works that discuss the benefits of algorithmic management for workers or suppliers or clients in digital work platforms;
Intervention	Outline the benefits of algorithmic management as advantages in digital work platforms;
Comparison	Does not apply since the benefits of algorithmic management are not compared, the present study simple collects information to build a catalog with a detailed analysis of articles that approach those benefits in digital work platforms;
Outcomes	How the benefits of algorithmic management have influenced the groups of interest in digital work platforms;
Context	Works that approach the benefits of algorithmic management as a management model for work on digital platforms.

We elaborated the research question based on the elements in Table 1. For the question to be fully answered by the SLR, we needed to establish search strategies and to establish a research protocol, both of which are detailed in the next section.

### **Search Strategies**

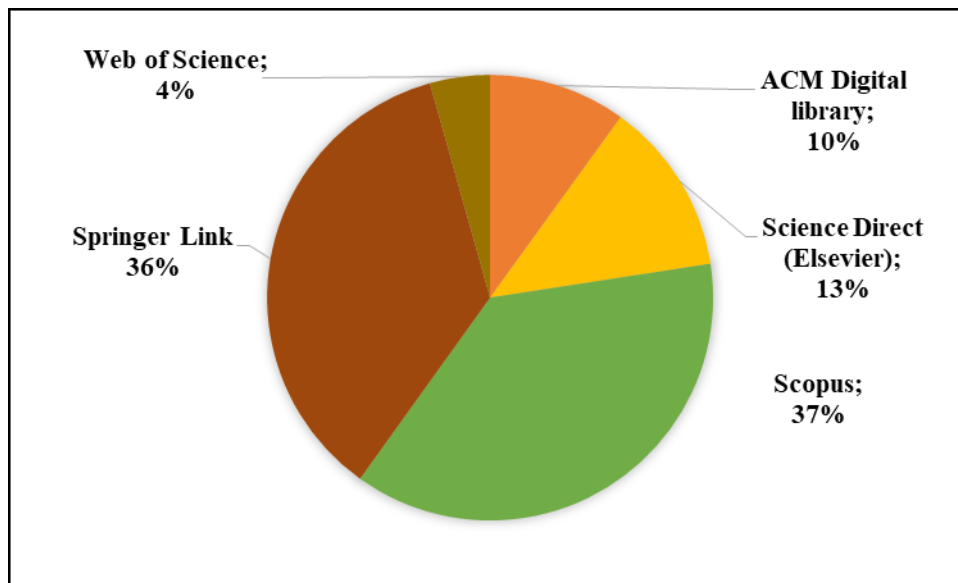
The initial sample of articles consisted in identifying the database used in the search and determining the research string. Gusenbauer and Haddaway (2020) claim that choosing a database is essential to secure the quality of the search, which can employ a research string. According to Shaffril et al. (2021), research strings allow many combinations and generate more specific results.

We selected the following databases for the present investigation: ACM Digital library, Science Direct (Elsevier), Scopus, Springer Link and Web of Science. Our choice was due to the adherence of journals from social sciences and to the adequacy of these bases to SLR according to Gusenbauer and Haddaway (2020). Despite the authors' dislike of Google Scholar, we used that base to support the search and analysis that demanded the number of citations for each article.

Given the need to increase the number of publications that approach algorithmic management, necessary to identify publications that targeted their possible benefits, we defined keywords to build the research string. The string we used for the pre-established databases was:

("labour conditions" OR "precarization of platforms" OR "decent work") AND ("gig economy" OR "platform economy" OR "sharing economy" OR "algorithmic management" OR "algorithmic governance" OR "digital labour")

The application of that string on the bases resulted in the identification of 873 articles. This was the first sample demonstrated in Figure 1.



**Figure 1 Results of the automatic search on the databases**

Figure 1 represents the articles found for each database. The most prominent bases were Scopus and Springerlink, respectively.

After the initial identification of publications, we established a protocol to define the studies to be included or excluded from the following analysis. To that end, we defined the inclusion, exclusion and quality criteria, which are detailed in the sequence.

### **Developing a Protocol**

Snyder (2019) suggests that the SLR protocols are established after the identification of aims and purposes of the research. Indeed, the very search strategy is a part of that protocol that can be modified in case results are not as expected, according to that author. Developing a SLR protocol means systematizing the research process (search words, database, intervals), identifying the selection criteria for the papers to be analyzed (inclusion, exclusion and quality) and establishing which data are extracted for later analysis. We selected one inclusion criterion (I1) and seven exclusion criteria (E1-E7) for the present study:

- (I1) peer-reviewed articles, conferences and workshops that discuss the benefits of algorithmic management in digital work platforms; or,
- (E1) Studies unavailable to download even after contacting the authors via e-mail; or,
- (E2) Studies with only the abstract available; extended abstracts or short articles (less than six pages); or,
- (E3) Studies with the same subject or duplicates; or,
- (E4) Studies that were not written in English; or,
- (E5) Studies that fail to answer the research question/ or,
- (E6) Studies that fail to meet the inclusion criterion; or,
- (E7) Studies that fail to meet the quality criteria

To be selected, articles ought to meet the inclusion criterion and none of the exclusion criteria. Studies that met one of the exclusion criteria were not selected for data extraction.

The inclusion criterion (I1) and the exclusion criteria (E1-E6) were applied at two different moments: reading the title, the abstract and keywords, since they present the necessary elements with enough information for the criteria to be applied. If the initial reading failed to present sufficient data for the analysis of inclusion and exclusion criteria, the article would move on to the second stage. After the first results, the second stage consisted in the complete reading of the articles, since a detailed reading would confirm the absence or the presence of inclusion and exclusion criteria. The results for the second stage were subjected to the quality criteria.

Quality assessment of the articles followed the identification of the inclusion criterion and the six exclusion criteria. Not meeting the quality criteria was considered the seventh exclusion criteria. For a SLR to provide the expected results, it is necessary that the articles have an adequate level of quality.

The definition of quality criteria followed the approach of Souza et al. (2019) and the bibliometric information of impact. Shaffril et al. (2021) suggest using different forms of evaluation for quality assessment of articles. In accordance with the authors, the present study established four possibilities for quality assessment (QA1-QA4).

The QA1 uses the index QualityScore, which is obtained from the equation applied to four general criteria (G1-G4) and one specific criterion (S1), as represented in Table 2.

**Table 2. The study elements and descriptions based on the PICOC method**

General criteria	Specific criteria
<p><b>G1:</b> Definition of the study problem and motivation:                      (1.0) there is a clear definition of the problem and the motivation.                      (0.5) there is a general definition of the problem and the motivation.                      (0.0) there is no definition of the problem or the motivation.</p>	<p><b>S1:</b> Are the benefits of algorithmic management raised and discussed?                      (1,0) defined and discussed clearly                      (0,5) simplified descriptions only                      (0,0) no discussion is present</p>
<p><b>G2:</b> Description of the study method:                      (1.0) there is a description of the study method.                      (0.5) there is a simple description of the study method.                      (0.0) there is no description of the study method.</p>	
<p><b>G3:</b> The article contributions refer to the results:                      (1.0) there is a clear correlation between the contributions and the results.                      (0.5) there is no correlation between the contributions and the results.                      (0.0) there is no description of the study contributions.</p>	
<p><b>G4:</b> Description of the study validity:                      (1.0) There is a formal description of the study validity.                      (0.5) There is some information about the study validity                      (0.0) There is no validation.</p>	

The scores of each criterion established in Table 2 varies from “0,0” to “1,0”. Therefore, QA1 can be calculated using the following equation:

$$QualityScore = \left[ \frac{\sum G=1}{4} + (S1 \times 3) \right]$$

In the equation, general criteria have weight 1 and specific criteria have weight 3. This is because the specific criterion is directly connected with the research question. The evaluation of QA1 is limited to QualityScore, therefore, they are not considered as subjective evaluations of the study quality. Concerning the other forms of evaluation, QA2 uses classification of publication forums; QA3 uses the number of citations and QA4 relaxes QA3.

The values of reference for QualityScore (QA1) were: >3 high quality publications; ≥ 1,5 and ≤ 3 intermediate quality publications; and < 1,5 low quality publications.

For QA2, the classifications used by CORE-ERA were used when the articles were from conferences and SJR for articles published in journals. The articles classified as A or Q1 and Q2 were considered high quality; as B or Q3 and A4 were intermediate quality; and as C or not classified were considered low quality articles.

Regarding QA3, the studies with over 5 citations were considered high quality, up to 4 citations as intermediate and no citations as low quality. At this point, Google Scholar was important to identify the number of citations.

To relax QA3, QA4 was based on the following references: recent studies (published in the five years following the research) with two or more citations were considered of high quality whereas no citations or one citation were considered of intermediate quality.

Considering all values of reference for quality assessment (QA1-QA4), for a study to be considered high quality, it could not be considered low quality in previous assessments.

After applying inclusion and exclusion criteria and, consequently, quality criteria, the remaining articles were moved to the data extraction stage.

Data extraction was conducted in three sections with the following fields:

**Section 1 (publication basic information):** title, congress or journal, year of publication, number of citations and database;

**Section 2:** registering the aim of the article;

**Section 3:** registering information about the algorithmic management as a management model for digital platforms.

Some bibliometric data can be applied to a SLR since this type of review allows for the easy identification of the data (Paul & Criado, 2020). For the purposes of the present investigation, demographic data was collected to provide an overview of how the objects of investigation were published: number of publications per year, number of citations per article, place of publication, identified characteristics and main contributions.

### **The Protocol Initial Results**

The initial stage of selection followed the application of the research string on the databases established in the protocol. The searches found 873 articles. Next, the inclusion and exclusion criteria were applied to the data (except for E7) based on the reading of title, keyword and abstract. That stage excluded 704 articles, leaving 169 primary studies for the next stage.

The detailed reading of the 169 studies and the application of the inclusion criteria (I1) and the exclusion criteria (E1-E6) excluded 119 articles from this sample. Hence, only 50 articles were subjected to quality assessment (QA1-QA4) and exclusion criteria E7. The assessment criteria excluded 33 articles, which failed to meet the protocol standards, reducing to 17 the number of articles subjected to data extraction and analysis.

### **III. Demographic Data**

This section presents the demographic data of the primary studies selected by the application of the research protocol and the refining of the sample.

The studies analyzed as objects of the present research were published in conferences (5) and scientific journals (12) between 2018 and 2021. The conferences were Conference on Human Factors in Computing Systems (2018 and 2021) and ACM on Human-Computer Interaction (2019 and 2020), both ranked as high-quality conferences (Ranking A). In turn, 10 of the journals were ranked as high-quality (Q1 or Q2) and two as intermediate quality (Q3), all of which were also published between 2018 and 2021. Only three articles were published in the same journal (Work Organisation, Labour & Globalisation).

Among the articles analyzed in this SLR, the most cited was titled “Work in the Platform Economy: Beyond Lower Transaction Costs”, by Jan Drahoukoupil and Agnieszka Piasna. On the data of the collection the article had 66 citations. Published by the journal *Intereconomics* in 2017, the article shows how technology increased and made flexible job offers on digital platforms, thus mitigating difficulties to enter the labor market, and expanded local borders to access labor (Drahoukoupil & Piasna, 2017).

The second most cited article had 33 citations and the title “Rating Working Conditions on Digital Labor Platforms”. It was published by Ellie Harmon and Michael Six Silberman, in 2018 in the journal *Computer Supported Cooperative Work (CSCW)*. The benefits mentioned by that investigation are centered on companies that represent digital platforms, particularly because of schedule flexibility and intense availability of workers for the tasks. This is more advantageous for companies due to the inexistence of regulation and union movements to protect and to claim rights for workers on digital platforms (Harmon & Silberman, 2018).

The article “The sharing economy and the job market: the case of ride-hailing drivers in Chile” was cited 26 times and signed by Andrés Fielbaum and Alejandro Tirachini. It was published in 2021 in the journal *Transportation*. The article mentions benefits for consumers, like fast transportation, waiting time, easiness of pay (virtual payment options), transparency of fees, no paid parking services, drinking without concern for who’s driving, and more comfort (Fielbaum & Tirachini, 2021).

This section presented some of the demographic data we identified in the results of this SLR. The next subsections will contextualize the phenomenon to answer the research question. We will also present the limitations and the validity of the study.

### **Context**

Since the mid-1990s, the world has changed dramatically with great economic and organizational trends such as globalization, flexibilization and privatization, which were triggered by information technology, generating benefits and challenges to workers, employers, consumers and policy makers.

Digital labor platforms have enabled the emergence of unprecedented opportunities with respect to the global exposure of services to workers, as evidenced by web-based platforms, as well as the expeditious identification of available labor in local market environments, as illustrated by location-driven platforms (Wood et al., 2019; Khovanskaya et al., 2019).

Work platforms are not only promoting changes in the workplace, but also restructuring labor activities, emerging as new actors in the realm of temporary occupations (Kinder, Jarrahi and Sutherland, 2019). Despite the contemporaneity of this phenomenon, the adoption of technology to manage a sporadic

workforce and offer its services to organizations, clients or individuals engenders, within this dynamic, the precariousness of working conditions on platforms.

The word platform is used for hybrid entities that use digital technology as an interface between users or consumers of a product or service and their suppliers (Rani & Furrer, 2021). Platforms create genuine economic value (Kinder et al., 2019). They provide means to approach a fundamental issue of economic organization, to coordinate offer and supply of millions of individuals, in the case of consumer markets, in the absence of complete information (Jarrahi et al., 2020).

Platforms achieve better coordination by using technology. Participants are not required to be at the same place and, although individual transactions are very quick, they do not need to happen at the same time (Rani & Furrer, 2021). Hence, the dramatic reduction in costs for price research conducted by consumers (Kinder et al., 2019). The importance of information for the economy is well understood (Harmon & Silberman, 2019). However, the costs of transactions in a change of market would be higher due to asymmetries in information or the absence of well-defined property rights (La Vega et al., 2021).

The cost of information and communication technology has been decreasing fast for some time, but some recent innovations have allowed platforms to grow as models, having cost reduction as a main springboard for value, including important digital payment forms and other financial innovations (Harmon & Silberman, 2019; ILO, 2021; Kinder et al., 2019; La Vega et al., 2021). The alignment of various facilitators – low transaction costs, low research costs and innovation in business and in communication systems, software and complementary services – helps to explain why the phenomenon of platforms was sudden and impressive, showing the benefits it has generated for companies/suppliers.

The increase in access to the Internet has led to a new work order with international institutions suggesting that workers can compete without conflict in a global market through digital work platforms. Economists have suggested that the access to Internet-based markets would allow a type of virtual migration that offers economic benefits similar to physical migration (ILO, 2021).

Over the past decade, we have seen an exponential growth of digital platforms, a phenomenon driven by the widespread availability of cloud infrastructures, as well as cloud computing services and venture capital investments (Fairwork, 2022). The revolution in the field of information and communication technologies has played a leading role in this landscape, stimulating the widespread dissemination of technological solutions by businesses and the subsequent search for digital products and services. This environment has provided fertile ground for the remarkable growth of these platforms (Atzori et al., 2018). It is worth noting that the impact of the digital economy has been amplified by the contingencies of the COVID-19 pandemic (Allegretti et al. 2021; Parwez and Ranjan 2021; Rachmawati et al. 2021).

In the context of digital work platforms, a relevant taxonomy is outlined, separating them into two distinct categories: internet-controlled platforms and geolocation-anchored platforms (Rani and Furrer, 2021). Such platforms have been inserted in a variety of economic sectors, where the diversity of skills required is remarkable, ranging from logistical activities to highly complex data analysis.

However, it is important to note that digital work platforms are currently substantially shaping the labor landscape. While offering opportunities for both workers and businesses, their rise has also created disruption in traditional sectors, such as the cab transportation market, and presents challenges for the future of work, given the often-unregulated nature of this occupation category (Burtch, Carnahan and Greenwood, 2018). However, many see work on digital platforms as an inspired ground for entrepreneurial and innovative initiatives, which in turn allows for greater flexibility and the establishment of a more harmonious balance between professional and personal spheres (Burtch, Carnahan and Greenwood, 2018).

The number of articles focused on the benefits of algorithmic management on digital platforms are still feeble, especially in regard to the benefits for the three groups involved – companies, workers and consumers. Our SLR was not capable of identifying articles that mentioned these groups individually. Therefore, we discussed the phenomenon to present the benefits to the groups involved with digital work platforms and answer to our research question:

**(QP) what are the benefits of algorithmic management for each group involved with digital work platforms?**

The primary actors engaged in algorithmic management are companies, clients, and workers. Therefore, we sought to understand how the literature presents the benefits for each group that is in direct contact with algorithmic management.

According to Abdullahi (2018), for companies (apps) that make use of algorithmic management, the benefits concentrate on cost reduction with labor, because they dispense with formal contracts, in addition to preserving human resources under demand. Kinder et al. (2019) also highlight that investing in

this new model of work relationship is advantageous once work platforms are growing and presenting business value and profit to shareholders.

In recent studies, Jarrahi et al. (2020) and Kinder et al. (2019) the focus of digital platforms lies in guaranteeing and generating profits, primarily through cost reduction, increased velocity, enhanced reliability or work quality production, and the expansion of outsourced tasks. There is a big debate mostly because these benefits can vary according to the type of digital platform and the place/region they are based.

Based on studies by Wood (2021), digital work platforms also add advantages by using the power of algorithmic evaluation and discipline to increase work intensity and impose long hours of work, consequently managing to have the worker available for longer time to complete tasks.

According to Rachmawati et al. (2021), the research demonstrates how digital platforms have effectively contributed to reducing issues related to public transportation, particularly with regard to parking problems in large cities. The development of platform economy is related to the urbanization of startups (Allegretti et al., 2021) and to policies that aim to create an intelligent city in a broader benchmarking strategy, which is linked to the digitalization economy (Heeks et al., 2021). That benefit can be taken to a higher level, encompassing not only the beneficiary of the study but the social and the political setting as a whole.

From the perspective of service seekers, i.e. clients and consumers, emerging digital working arrangements are advantageous in several respects. Among these advantages are the efficiency made possible by reception and the relative cost containment, which is linked to the significantly reduced remuneration reserve resources (Ma, Yuan, Ghafurian, and Hanrahan 2018; Kinder et al. 2019; La Vega et al. 2021).

In researcher with Uber clients, for example, they report as advantages for using the platforms: short travel time and waiting time, easy pay, transparency of fees, no need to find or to pay for parking, no need to drive after drinking and more comfort (La Vega et al., 2021; Rachmawati et al., 2021; Tang et al., 2019; Tirachini & Del Río, 2019). Kinder et al. (2019) identified that digital platforms save the consumer's time and make it easier to compare prices of products and services.

Workers, in turn, are attracted by the discourse of autonomy and flexibility of digital platforms. By projecting attractive promotional policies and incorporating each task to that dynamic, platforms stimulate workers to conclude their activities and prevent boredom. Therefore, workers see work as interesting and feel motivated, thus abiding by the platform rules, producing enough or more than the necessary to be rewarded (Abílio et al., 2021).

Another benefit used to attract workers is the feeling of the inexistence of an immediate boss (Wu et al., 2019). In that regard, the platform is more an employer than a database (Anwar et al., 2021), but its control has become invisible (Wu et al., 2019).

Kinder et al. (2019) argue that the sharing economy is not random, but a business strategy. The authors claim that, although platforms call their operation sharing, apps only allow the operation of capital between two parts, without real sharing ever happening.

In the sharing economy, the words work and worker are replaced with user, sharing, task, help, service and so forth, making workers invisible and, gradually, becoming an extension of IT devices, virtual platforms and smartphone apps (De Stefano & Wouters, 2019).

On the other hand, the International Labour Organization (ILO, 2021) and Rani and Furrer (2021) demonstrate that evidence on platform work shows the illusion of flexibility. In order for work to remain active on the platforms, it needs to be constantly available and react promptly to the clients' requests. This intensifies the repercussion of work in social life. In addition, the undefinition of physical boundaries between work and household poses a threat to workers' health and safety.

The continuous growth of work platforms represents new opportunities and challenges for workers. While work is seen as an opportunity for entrepreneurship and innovation, allowing the flexibility and balance between professional and personal life (Burtch et al., 2018), it is mostly seen as a "platform for exploration" (Kessler, 2018), questioning sustainability and justice in working conditions. There is a conflict between workers and organizations represented by applications that goes far beyond remuneration and flexibility, mainly involving control, dependence and precarious working conditions (Meijerink et al., 2021).

For Belanche et al. (2021), the significant technological development of the past decade, especially the properties of the largest capitalist corporations, have only increased the critical precariousness of work relationships. This fact corroborates with Kahancová et al. (2020), who conclude that the risk and the origin of precariousness in work platforms is not due to low income or irregular work hours, but manifested especially in the lack of autonomy and representation of collective interest..



### **Limitations**

The essence of a SLT can be considered limiting as a research protocol is established to systematically search results based on the given constraints. In other words, choosing database, Keywords, inclusion and exclusion criteria can exclude some studies from the initial result. Nonetheless, that condition does not reduce the relevance of that method because the definitions of the protocol must rely on criteria to increase the chance of results that generate a likely overview of the research problem.

Shaffril et al. (2021) present a methodological guide that helps building a SLR and reinforces its importance for the scientific community. According to the authors, there are important definitions which generate transparency and chance of replication. Moreover, the findings derived from a comprehensive literature review are expected to address the research question in a pertinent and insightful manner (Paul & Criado, 2020). Conversely, the protocol imposes limitations on the outcomes, restricting them to the predetermined criteria.

Some limitations derive from the methodological choices designed for the SLR whereas some are due to the absence of elements that potentialize results in the primary studies analyzed. Among the limitations we identified in those primary studies are the geographical location of the data, the temporality of data and the limited number of articles in the field of Business.

Most studies were conducted in countries in the geopolitical North (such as European countries). That prevented an overview of countries in the geopolitical South with peculiar economic and social conditions. According to estimates, there are approximately 60 million digital platform workers in the geopolitical South, with 3 million relying solely on digital platforms as their primary source of income, while in the geopolitical North, around 10 million workers use digital platforms predominantly as a supplementary income source (Heeks, 2017; ILO, 2021). That difference goes beyond the numbers since countries in the geopolitical South already have a history of informal work, elevated turnover, low salaries and work relationships that perpetuate and update slavery-like work models (Abílio et al., 2021), which makes these countries fertile ground for the proliferation of digital work platforms.

Another limiting factor is connected to the time of data collection and analysis, since the studies were cross-sectional and no longitudinal studies were identified. Finally, the research in algorithmic management is strongly related to areas of Information Technology, Information Systems, and computer science and corporation management. Therefore, articles present limited data on work relationships and the benefits of algorithmic management from a Business perspective.

### **Validating the Studies**

The inclusion and exclusion criteria defined in the research protocol allowed for the validity and the reliability of the selected studies. Those criteria enabled the sampling of articles of greater quality by selecting peer-review publications and by using the QualityScore, which used bibliometric impact as a feature of quality legitimacy.

An intrinsic element of SLR that we employed in the present study was the detailed and careful register of the process, to allow for replication. According to Gusenbauer and Haddaway (2020) and Shaffril et al. (2021), replication is a necessary condition of this method. Merriam and Tisdell (2015) argue that describing the method in detail allows for a great transference potential for future researchers, since the detailed register of each stage allows for an assessment coherent with the methodological application, it also allows other groups to replicate the study, ensuring the validity and the reliability of the research.

In addition to validating the SLR, it was also necessary to validate the 17 articles that constituted the objects of analysis. Most of these studies employed a qualitative approach and used techniques to increase the results validity and reliability. Among the many techniques used were data triangulation and interviews with experts. The studies were considered reliable when they were rigorously conducted and employed methodological techniques that guaranteed the research validity and reliability (Merriam & Tisdell, 2015).

Validity and reliability were considered from a micro perspective (in each of the 17 articles) and a macro perspective (considering the SLR). That enabled data collection and analysis, generating insight into the results.

## **IV. Overview of the Results**

McKendrick (2020) offers an important contribution to the discussion by highlighting the recent findings of his research, which emphasizes the replacement of managers by technology, as opposed to labor workers performing more operational tasks. The current scenario presents a multiplicity of business models that have algorithms as a predominant figure, notably evidenced by digital labor platforms such as Uber, iFood, Wolt and Amazon, among others. These platforms constitute an intricate set of digital infrastructures that play an intermediary role between consumers and workers, converging supply and

demand for labor activities. It is pertinent to note that in many cases, a single corporate entity exercises control over this digital infrastructure, boasting it as an active owner. In this way, such examples strikingly illustrate how control is manifested through the interplay of diverse psychological factors (Kinder et al., 2019; La Vega et al., 2021).

Within this dynamic, Woodcock and Graham (2020) make a fundamental distinction between two categories of platform-based work. The first category encompasses activities intrinsically applied to a specific geographic location, requiring the execution of tasks in a given place (exemplified by the delivery of food from a restaurant to an apartment or the transportation of an individual from one part of the city to another). In contrast, the second category, also known as "cloud work", as mentioned by Woodcock and Graham (2020), is characterized by the theoretical ability to be requested and performed in any location. In this context, requesters or clients in one geographical region can use digital labor platforms to locate workers located anywhere on the globe.

A range of firms have increasingly adopted digital labour platforms, both internet-based and location-based, as part of their strategies to achieve efficiency improvements and customer base expansion, culminating in organizational productivity increases (Ma et al., 2018; Kinder et al., 2019).

Work intermediated by such digital platforms has received wide acceptance for its positive repercussions on labor markets in developing nations, prompting the creation of new sources of income and employment in localities facing economic stagnation (Khovanskaya et al., 2019). These platforms play a crucial role in fighting poverty by engendering facilitators of economic inclusion (Kinder et al., 2019). In this way, the shared conception that the digital platform-driven labor paradigm can emerge as a source of attractive employment opportunities, particularly for working with reduced resources and support in developing countries, and for those facing unemployment, is presented positively.

In many developing countries, government authorities see digitally-mediated work as a potential catalyst for positive employment opportunities, including as quick fixes to employment and income shortages (Harmon and Silberman, 2019; Khovanskaya et al., 2019; Allegretti et al., 2021; Rachmawati et al., 2021), culminating in the implementation of digital initiatives and infrastructures aimed at training individuals to enter the workplace on platforms such as Clickworker and Upwork, among others (Rachmawati et al., 2021). In larger urban contexts, such as capital cities, in developing countries, there is a remarkable adherence to the proposal of training institutes aimed at preparing workers in a wide range of microtasks, ranging from accessing content to search engine optimization.

However, when it comes to training labor to perform tasks that are more catered to software development platforms, such as coding and programming, a more advantageous route is in sight (Wu and Li, 2019). The argument underlying the imminent benefits of digital work in developing country labor markets also rests largely on the dynamics of relative bargaining power, where workers can dispose of their skills that offer better conditions and companies, in turn, can seek employees who demand lower compensation (Graham, Hjorth and Lehdonvirta, 2017; Kinder et al., 2019; Khovanskaya et al., 2019; Harmon and Silberman, 2019; Allegretti et al., 2021; ILO, 2021). Thus, the importance of the dynamics of bargaining power in the relationship between workers and companies operating on these platforms is highlighted, and how these dynamic influences the remuneration and selection of workers. However, this negotiation and especially the communication itself between workers and digital platforms are precarious and not yet presented as a bargaining alternative to improve working conditions.

Structural institutional asymmetries benefit the organizations that control capital and technology, leaving those at the bottom of the economic pyramid - the workers, without alternatives and unable to change their social condition (Parwez 2016; Ma et al. 2018; Kinder et al. 2019). Such a condition leads to the deepening of inequalities stemming from modernization and technological innovation. Thus, the role of digital labor platforms in transforming labor markets in developing countries, highlighting their benefits and challenges. This setting generates rhetorical and reflective questions for field researchers: by connecting digital work platforms and the working conditions they provide, who is the actual beneficiary of that innovation? What is the non-financial price paid by platform workers to benefit certain groups?

## **V. Research Opportunities and Future Research**

Corroborating the ideas of Paul and Criado (2020) about the results of a SLR, we identified new possibilities and insights for future investigations. Among the gaps we verified, we list a few opportunities:

- Analyzing the problems and possible solutions of algorithmic management in digital work platforms;
- Examining the implications of algorithmic management in digital platforms in conjunction with public policy initiatives;
- Analyzing the impact of algorithmic management on various occupations and economic sectors experiencing parallel growth in the market. Identifying the factors that mitigate structural asymmetries in relationships between digital platforms and workers.

## VI. Conclusions

In conclusion, the current panorama characterized by the wide dissemination of digital platforms in contemporary society and economy, intensified by the emergence of the COVID-19 pandemic, highlights the undeniable need to delve deeper into the analysis of the conclusions of these advances for all those involved in the digital economy. The increasing reliance of businesses and consumers on digital work platforms, along with their growing influence in reconfiguring the labor landscape, calls for a critical and in-depth assessment of the ramifications of these trends.

The management of digital platforms, operationalized through management algorithms, emerges as a central element in this context, outlining strategies that enforce compliance with pre-established guidelines. This form of management, responsible for the control and allocation of work, often employs non-personalized motivational incentives, such as gamification, to encourage continued work production. However, in an unhealthy way, encouraging workers to increase the pace and hours worked on the platforms.

While digital platforms have triggered a gradual transformation in the relationship between workers and customers, mediated by technology, further analysis reveals that, in many respects, these platforms have maintained the benefits arising from the creation of job opportunities. This has led to a global rise in their popularity among policymakers and government officials as a lever to stimulate economic development and the diffusion of information and communication technologies (Harmon and Silberman, 2019; Allegretti et al., 2021). However, even in the face of these advances, digital platforms attract workers from diverse fields and regions, due to the inherent advantages of flexible working hours, remote working and choice of tasks (Berg et al., 2018; International Labour Organization, 2021; Rani and Furrer, 2021).

Companies derive substantial benefits from online platforms by leveraging access to global talent, stimulating innovation, enhancing recruitment processes, meeting costs and optimizing operational efficiency. On the other hand, delivery and localization platforms offer versatility by enabling an expanded customer base, adapting quickly to consumer demands, improving productivity and demonstrating resilience in times of crisis, as observed during the COVID-19 pandemic.

Despite the lucrative opportunities offered by digital platforms, especially for those workers exploring online opportunities, there remain challenges experienced, such as the accessibility of these opportunities, especially for migrants and workers in vulnerable situations, given resource barriers. The inherent flexibility of these platforms, which allows the reconciliation of work and family care, has contributed to their attractiveness.

However, a critical review of working conditions reveals persistent concerns such as lack of access to employment, absence of social protection and financial instability stemming from low incomes (Berg et al., 2018; Federal Reserve Board, 2019; Rani and Furrer, 2021). Therefore, it follows that while digital work platforms hold promising potential to sustain economic growth and contribute to the United Nations Sustainable Development Goals, their success is intrinsically linked to the establishment and maintenance of decent work standards and equitable regulations. The pursuit of "decent work" emerges as a fundamental imperative, requiring the impartial application of core labor standards to all workers, regardless of their contractual status.

Addressing the challenges posed to digital platform workers requires a multifaceted approach involving stakeholders such as governments, platform operators and civil society. Briefly, we can list some suggested solutions, which are already being debated for these challenges: Regulatory frameworks and labour laws (Katz, LF, & Krueger, AB; 2019); Collective bargaining and unionization (Valenduc, G., & Vendramin, P., 2017; Drahoukoupil, J., & Piasna, A. 2017); Transparency and algorithmic fairness (Diakopoulos, N. 2016); Portable benefits and safety nets (De Stefano, V. 2016); Reskilling and training (Berg, J., et al. (2018); Third-party audits (Wood, AJ, & Graham, M. 2020); Workers' representation in governance (Berg, J. & Kim, JY 2018); Universal Basic Income (UBI) experiments (Santens, S. 2016); Platform cooperatives (Möslein, KM, & Picot, A. 2019); Multi-stakeholder dialogue (ILO 2020); International collaboration (UNCTAD. 2018) and Ethical Design of Platforms (Diakopoulos, N. 2016). These references can provide additional information on each topic and support the suggestion of solutions to the challenges faced by workers on digital platforms.

It should also be noted that such solutions should be adapted to the specific needs and contexts of different regions, economic and social aspects. The key is to create a balance between the benefits of temporary work and ensuring the well-being and dignity of workers participating in the digital economy.

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