

Contents lists available at [ScienceDirect](https://www.sciencedirect.com)

Futures

journal homepage: www.elsevier.com/locate/futures

Images of the “future of work”. A discourse analysis of visual data on the internet

Małgorzata Ćwikła^{a,*}, Eva Lindell^b

^a Jagiellonian University, Poland

^b Mälardalen University, Sweden

ARTICLE INFO

Keywords:

Discourse analysis
Future of work
Technology
Visual analysis

ABSTRACT

This paper presents findings from a critical discourse analysis of visual data gathered in regular, monthly data sampling on Google, DuckDuckGo and Bing on the theme ‘the future of work’ that were published online on Polish and Swedish websites during 2018–2021. Visions about the future in the form of images create an archive of ideas on the potential directions of societal development, where discourse is present both in what is visible, and what is invisible. The study shows predominantly stereotypical framings of work by young office workers. Conclusions are drawn on how the future is visualized contrary to popular claims of job losses that are predicted to strike mainly the younger, middle-class population. In the images collected, humans appear as mainly content in a working life without manual labour, frustration or clutter, but also without leisure, displaying a lack of visions of an older workforce, as well as the possible role of humans as useful and fulfilled without work in the future.

1. Introduction

Research on the future of work contains dystopian (Czarniawska & Joerges, 2020; Paus, 2018) as well as utopian (Czarniawska & Joerges, 2020; Schwab, 2017) visions. These appear either as images of increasing unemployment (Frey & Osborne, 2017) and humans forced to be under digital surveillance (Parenti, 2001) or as increased inclusion and diversity (Autor, 2020), with room for creativity (Zagalo & Branco, 2015) and even an increase in joyful leisure providing improved health, and wealth worldwide (Standing, 2017). How changes are displayed (which will inevitably impact policies on a societal and an organizational level), and how individuals make decisions concerning education and career choices require attention. Also, the discussion on humans and more-than-humans evolves and shapes the ontological understanding of working beings (Czarniawska & Joerges, 2020), resources, and ethical issues like care (Bellacasa, 2017). Human interaction with and through machines expanded in all sectors emphasizing the close interaction between humans and technology in the context of work as an answer to current challenges. This is the “new normal” (Carroll & Conboy, 2020) which, however, will evolve, making the question of the future of work constantly interesting.

This study focuses on images of the future of work: their social production online as well as the social effect that this visualisation might bring (Rose, 2022). Through a discourse analysis approach to visual material (Rose, 2022), we abide by the claim by Dator (2019) that the future cannot be predicted, but rather imagined, and any images of the future should be contested, ridiculed, envisioned, and re-envisioned. As highlighted by Gall et al., (2022, p. 2) “Futures studies is not about finding the one likely future, but the

* Corresponding author.

E-mail addresses: malgorzata.cwikla@uj.edu.pl (M. Ćwikła), eva.lindell@mdu.se (E. Lindell).

<https://doi.org/10.1016/j.futures.2023.103235>

Received 21 October 2022; Received in revised form 5 July 2023; Accepted 16 August 2023

Available online 19 August 2023

0016-3287/© 2023 The Authors. Published by Elsevier Ltd. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).

multiple possible futures.” The future in its multiplicity is produced through imaginaries, and thus produces itself. Our claim is thus that the discursive framing of the future of work in images available on the internet influences how the value of work is perceived, and thus produces and reproduces routes towards the future as preferable and possible. The importance of this approach corresponds with the continuous interest in futures studies over the past 70 years in the management practices of forecasting, planning, and decision making (Oliver Schwarz, 2008), as well as futures literacy as sought-after skills in management studies for the development of socially sustainable organisations (Spanjol et al., 2023). Nevertheless, in this study, the notion of images of possible futures should be understood not as predictions, but as visualisations of preferred and contested ideas of the future (Dator, 2019) posted online by various content producers.

Critical approaches to visual materials make it possible to address questions on meaning and power (Rose, 2022) in organisations as well as in society. Even as visuals are, and have been, omnipresent in society, scholars claim that visual analyses are underused and under-theorized in organization studies (Styhre, 2010) as well as the sociology of work (Strangleman, 2004). In particular, Styhre (2010, p. 165) points to the importance within organisational theory of understanding functions of everyday work through “the birth of the Internet as the predominant mass medium for the distribution of surface code, i.e., photos, images, film clips, and so forth, the centuries-old tradition of sharing information through texts and linear writing is at stake”. Likewise, Strangleman (2004) highlights the importance of pluralistic approaches to address the rise in visual aspects in the representations of labour in “our culture” (p. 186.). Recently, Rose (2022)¹ highlighted the increasing interest among scholars to take seriously the effects of the rich flora of visual materials displayed, and circulated, on the internet. We claim that more can be done to understand our present as well as our future through the investigation of visuals with critical theory framing and methods, as well as what aspect this ‘visual turn’ can bring to future studies of work. Following on from this claim, more specifically, in this article, we want to contribute to the existing scholarship in management studies on the idea of the future of work by discussing the role of images in showing possible ways of working in the years to come. We do so by taking into account visual materials used to illustrate diverse contributions about the future of work posted on Polish and Swedish speaking Internet sites (webpages, documents, reports, commercials, etc.) between 2018 and 2021. In this way we critically refer to the “visual turn” (Bell & Davidson, 2013; Jay, 1996; Jay, 2002), the “iconic turn” (Moxey, 2008) or the “pictorial turn” (Jay, 1996; Mitchell, 2018) in social sciences, that has been described as: “the ubiquity of the visual, together with its distinctive characteristics and power, it is imperative for researchers to investigate the many organizational manifestations of the visual and the methodological challenges that they raise” (Bell & Davison, 2013, p. 168). We also draw attention to the critical approach to analysis of visuals, treating them as constructed and constructing social relations and social power through discourse (Rose, 2022) due to conscious or random framing decisions made by the publishers. This is also due to the unprecedented accessibility of pictures and contributes to the discussion on power relations produced by omnipresent visual statements. Thus, it is important to show not what internet users read about the future of work while searching the web, but rather why they see what they are expected to see. Search relevance undergoes constant adjustment of the algorithm (Hajian et al., 2016; Van Dijck, 2010; Wallace, 2016) during the Big Data era (boyd & Crawford, 2012) which is already with us, resulting in fluctuations and shifts. Furthermore, to optimise the results big tech companies like Google are collecting feedback from humans rating the cultural and social relevance of the results in geographical regions. This happens at various levels, to recognize the needs of groups as well as individuals and to provide tailored results. These aspects are investigated by researchers showing the algorithmic foundations of the search results (Bilić, 2016; Rogers, 2023), the differences of results obtained by users from one Web search engine to another (Jansen & Spink, 2006), the various modes of searches and their constant advancement, including preferences for visual search (Dagan et al., 2023; Datta et al., 2008) and development of the image retrieval (Hyun et al., 2022; Nurrosyidah & Wang, 2023).

Based on these considerations, we see a need to highlight visual analysis as complementing and leveraging linguistic knowledge within management studies and focus on the motivations behind particular framing of the future of work and the ambiguity of recurring symbols often used in visual communication (Mariani, 2019; Fergnani & Song, 2020). Thus, we investigate the human decision made prior to the algorithm decision on the content delivered to the internet users interested in the future of work. The focus on the visual material holds a potential to gain a reflexive understanding of lives in organizations (Kunter & Bell, 2006), work in a more general sense, and could be part of the critical discussion on narratives shared online. By doing so we underline the importance of visuals for societal change (Jenks, 2002) mediated by both humans and machines to understand the presentation of the future of work and its political dimension that can be implicitly exposed. The contribution to future studies concerns the discussion on the purposes of using visuals to frame narratives when it comes to a topic of high societal relevance and interest, such as the future of work and letting them circulate on the web according to the continuous change of priorities of the algorithms.

2. The future of work in management studies

The impact of technology as dystopian and devastating to humans has been embraced through history. One such famous example was the Luddites, British textile workers who protested by smashing newly developed machines in 1811, as this technology was perceived as threatening their jobs and livelihoods (Jones, 2006). Technology described as replacing human labour leading to mass unemployment was predicted by thinkers, such as Keynes in 1930, a message that was then repeated in literature through the 20th century (Aronowitz & DiFazio, 1994; Leontief & Duchin, 1986; Rifkin, 1995).

Continuing into the 21st century, in relation to the future of work, the use of computers has regularly been described as a source of

¹ The matter of visual materials on “online image bank and search images” are introduced in the 5th edition of Rose (2022, p. 106)

jobless growth, where the economy might be thriving at the same time as possibilities for employment are declining (Brynjolfsson & McAfee, 2011). The prediction that almost 50% of jobs in the US would be replaced by computers or offshored through the fragmentation of production chains enabled by IT, with this replacement of human labour portrayed as a threat in the future, was put forward by Frey and Osborne (2017, p. 1).

This susceptibility to technology has been predicted to strike the middle-income segment of the labour market as a first wave (Autor & Dorn, 2013), whereas high-income jobs would become reduced due to sophisticated software as the next step in labour market change (Brynjolfsson & McAfee, 2014). The conditions for low-income service sector jobs have been predicted to maintain manual labour on a larger scale (Goos & Manning, 2007; Autor & Dorn, 2013). But as work is not only to be understood as the creation of necessary products and services, but also as the eagerness of humans to participate in society, the display of humans engaged in work must also be understood as a prevailing societal ideology (Paulsen, 2010), and equally as the basis for the simultaneous trends of a decline in the need for human involvement in work, and the increase in working hours among humans leading to stress and burnout on a large scale. This, while new workplaces evolve around the Globe as digitalization and globalization of work allow for the migration of work to developing countries (Smith, 2006).

Nevertheless, thus far predictions of (global or Western) job loss on a large scale due to digitalization, and techno-pessimism predicting a jobless future due to robots and AI, have been proven wrong (Fleming, 2019). Influential thinkers on the future of work have argued for the promotion of paid work as a source of self-worth, health and societal self-fulfilment (Brynjolfsson & McAfee, 2014), while neglecting the display of societal power relations (Spencer, 2017) and capitalist drivers of technology (Huws, 2014).

In recent decades, structural changes in industries and labour market relations have constantly impacted how, by whom, and where work is performed. In the 21st century, conditions for working life, associated with flexibilization, have further led to rapidly expanding marginalization and exploitation of groups of workers engaged in temporal and insecure conditions for labour (Standing, 2014), enforcing segregation. On the other hand, optimistic forecasts might foresee technology as enabling ideas of working life safety and equality (Autor, 2022). Hence, not only is the amount of work changing due to technology, but so are the very social structures of labour market relations.

Hence, the future of work rests on discursive constructions of dystopian views of mass job loss, and exploitation through the rising precariat, increased labour market stress, and utopian views of an increase in robots enabling human leisure time, and a decrease in labour considered dangerous for humans. These discursive constructions of the future of work are present in our everyday lives; in popular culture (books, movies, art), mass media, and internet sites. In texts and visuals surrounding our everyday lives, we take part in dystopian narratives of robots taking over human work or even lives and becoming so intelligent that they might surpass the tasks they were programmed for. Furthermore, we are involved in utopian narratives of robots or AI taking over inconvenient, boring, or impossible work tasks, doing them faster and better than humans, offering care and protection, and creating a new work-life balance for humans as well as proposing intelligent solutions to many of the world's most devastating problems (Czarniawska & Joerges, 2020).²

3. A discourse analysis framework to visual material

Styhre (2010, p. 163) points out that “images such as photographs and paintings are by no means self-explanatory, but are always comprised of layers of meaning that need to be carefully examined and interpreted”. Thus, analysis of visual materials requires in-depth, critical methods. A critical discursive approach rejects central assumptions of traditional psychological research (Potter & Wetherell, 1987) and does not claim to reveal true intentions or attitudes (Ainsworth & Hardy, 2004, p. 237). Instead, analysing discourse concerns “the ways that individuals construct their versions to *do* things.” (McKenzie, 2002, p. 2). Discourses are seen as socially produced, and as such are organised to legitimise themselves (Gill, 1996). For example, in social patterns, silence is as productive as the explicit (Billig, 1991; Ryan-Flood & Gill, 2013; Fairclough, 2010). For our analysis, the same could be adapted in terms of visual language. Discourse is visible in what is visualised, and what is *not* visualised (Rose, 2022). Still, discourse analysis is usually focused on text and the use of language (Potter, 1996; Potter & Wetherell, 1987; Wetherell, 1998), however, visualisations are unarguably part of the production and reproduction of discourse (see for instance Edley, 2001).

Using the words of Rose (2022, p. 215) with reference to the influential works by Foucault (1972): “discourse is a particular knowledge about the world which shapes how the world is understood and how things are done in it”. In more critical approaches to discourse, humans are recognized as both producers and products by discourse (Billig, 1991); both the constitutive forces of discourse and individual agency as humans use discourses in everyday conversations through text or visual materials composed through relational sense-making (Edley, 2001; Edwards & Potter, 1992). In empirical materials, single statements as well as larger patterns can point the researcher towards the understanding of discourse and what discourse does to our understanding of society, as well as how discourse affects our doings in the world. Nevertheless, it is often difficult to understand who is making the decision on framing the discourse.

A recognized problem in exhibitions of visuals emerging in every-day life (such as postcards, photographs, drawings or commercials) is that provenance is hard to trace (Rose, 2022). This is an old phenomenon, known from history. A similar problem occurs in contemporary exhibitions of visuals from the internet. One picture might show up in several different contexts, and thus gain different

² While we are finishing this paragraph, trying to answer comments from the reviewers in our human, non-perfect way, the discussions on the ChatGPT writing academic papers is flourishing (Dwivedi et al., 2023). Already now, as all through history, we are involved in processes considered part of the future of work.

contextual and intertextual meanings. However, discourse is constructed and displayed in the pattern, the coherence across different archives, sites and visual contexts (Green, 1990). Context is viewed as co-created through ongoing human interaction (Fairhurst, 2009), and infused by other images through intertextuality, which is “the way that the meanings of any one discursive image or text depend not only on that one text or image, but also on the meanings carried by other images or texts (Rose, 2022, p. 216). Therefore, interesting discourse analysis findings come from embracing different, even otherwise unrelated, empirical materials (Rose, 2022). Critical discursive approaches can be used to connect the institutional location while addressing a multitude of micro discourses in local interactions within such a “particular social, cultural and historical setting” (Wiggins, 2017, p. 45). Thus, the multitude of images representing different aspects of the future of work on the internet must be understood not as singular, but in relation to each other; visualising certain aspects and silencing others by not representing and not visualising. Someone made the decision governing what we can see and what is not visually represented. The institutional location of the multiplicity of visuals on the internet in this case co-constructs the notion of ‘the labour market’ as institution: what the labour market is, what it looks like, who inhabits it and who does not.

Based on the above, the social modality of the image as well as the image itself as socially produced is in focus in the scope of research (Rose, 2022). In particular, discussion will focus on visibility, and invisibility (Ryan-Flood & Gill, 2013) in relation to the discursive construction of the future of work, and what the absence of these representations does to our understanding of the “future of work”. This makes a critical discourse analysis framework suitable for the exploration of the multitude of visuals published on the internet – on websites, reports and commercials – with this overarching aim of this profusion of visuals being to socially visualise the future of work and explain the strategies behind choosing particular pictures and not others.

4. Research design

This qualitative research was conducted simultaneously in websites in Swedish and Polish. Both countries have a high rate of labour force participation among aged 25–64 years old: 80% in Poland and 89% in Sweden (OECD, 2021). The choice of the countries resulted from our common interest as researchers localised in two different European countries, our knowledge of Swedish and Polish and a wish to privilege non-English language websites which reflected our holistic approach to the topic. Further, the choice of two different languages broadens the social frame where the images are published, the institutional location where the visual communication is embedded and produced (Rose, 2022). This choice not to privilege English language websites, and thus the academic hegemony of the use of English (Steyaert & Janssens, 2013), highlights the association between language and visuals. As visuals and pictures do not have a written or spoken language, they still stem from a cultural context coloured by the linguistic and national cultures that contextualise them.

To collect comparable data in a systematic way, we decided on several criteria. We were interested in exploring recurring patterns as well as visualisations and invisibility of discursive constructions of work and labour market over time. Thus, we used this phrase as our keyword to search the same every time: “future of work” in our national languages (in Swedish: “framtidens arbete” and in Polish: “przyszłość pracy”). When searched on Google without any restrictions we obtained nearly 60,000,000 results related to the future of work (both languages combined). Consequently, we applied a specific approach to narrow down the searches and to follow this topic month by month. Each of us individually adjusted the search spectrum to the previous month and the given language.

The material was collected on the first working day of a given month, in the period: April 2018 - March 2020. In addition, to take into account the experience of the Covid-19 pandemic, the material was supplemented in October 2021 - December 2021. In this way we conducted time sampling over more than three years to obtain data on the same topic in concrete intervals (Bolger & Laurenceau, 2013). Despite the warning by Rose (2022) that searches on databases rely on tags that may or may not be appropriate to the topic of interest, our research interest was to trawl the internet as wide as possible to find visual sources related to texts and documents about the “future of work”. To increase the reach and performance of our search (Negi & Kusmar, 2014), the gathering of empirical material was conducted in one keyword-based engine (Google) and two semantic search engines (DuckDuckGo and Bing). In this way, we combined sources with different business profiles and personal data management policies. Since we, as researchers, were not engaged in producing the empirical material, our search resembles the emphasis some discourse analysts place on the importance of using naturally occurring empirical material (Potter, 1996; Potter & Wetherell, 1994).

Furthermore, we wanted to avoid a filter bubble³ through access to various data to embrace a fuller picture of discursive constructions of ‘the future of work’, not targeted to a specific producer or to a specific professional audience. For this reason, we did not introduce any restrictions on the type of material; we collected press articles, commercials, information about conferences and training courses, reports, interviews, posts on social media (Facebook, LinkedIn, Twitter). However, the material did not contain scientific materials (articles, or entire books). This shows that scientific content is shifted to specific databases, such as Google Scholar (Gusenbauer, 2019). Thus, the study is based on mainly non-scientific sources easy to find on popular search engines.

Some of the results were repeated on two or all search engines. It also happened that despite the fact that the search was narrowed down to the last month, there were older articles that bore no relation to the future of work, the most accurate and up-to-date being the results from the keyword-based search engine Google. Sources from Poland and Sweden were saved separately in dedicated folders for

³ A filter bubble refers to the personalized information and content individuals are exposed to online, based on their previous behaviours, beliefs, interests, and preferences. In this way different opinions and opposite perspectives are hidden from them. This phenomenon has political and societal implications and can impact democracy and critical thinking. Knowing this process, internet users might become proactive in their efforts to find diverse information. See more: Pariser (2011). *The Filter Bubble: What the Internet is Hiding from You*, London: Penguin.

each month and subfolders for each search engine.

Going through the images we encountered several problems concerning which to include, a known problem related to quantification in visual analysis (Bell & Davison, 2011). First, while some images were clearly related to the topic of the future of work, others appeared peripheral. For instance, in hits discussing farming in relation to the future of work were images of fields and animals. Going through the image material several times we realized that if we were to exclude images that seemed peripheral, we would tend to privilege inclusion of image material that was closer to our own practice (offices, computer screens, etc.) over other work contexts such as hospitals (x-ray machines, washing hands), schools (school buildings, class room interiors), homes (domestic sceneries, sofas, children), or farms (crops, fertilisers, cows). As our aim was to explore the construct of the future of work on the internet, we hence decided to include all images found in the hits that in themselves were related in any aspect to “the future of work”. As already stated, critical approaches to discourse recognise humans as both producers and products by discourse (Billig, 1991). Thus, as researchers and humans we are part of the discursive production of ‘work’ through the constitutive forces of discourse. Therefore, a policy of embracing as wide a variety as possible of images was deployed in order to minimise the risk of inclusion bias.

The second problem we encountered was related to experts who might appear as writers of the text, speakers in conferences or workers in a specific profession related to the future of work in their profession. Again, in order not to privilege specific “thinkers” over others, we decided to include all humans appearing in images (both as illustrations of the articles and as portraits of authors or interlocutors).

The third problem was related to time and the ontological status of the future. In some hits we found images that clearly illustrated old workplaces, for instance secretaries sitting behind typewriters, children working in an old mill or 20th century human-size mechanical dolls. Our first decision was to exclude such images, but we then encountered the problem of drawing the line between “the past” and “the future”. The subject of our study was the visualisation of the future on the internet as cultural and social fact, thus what we had collected and considered as past should also be included. After all, analysing images requires interpretation and cannot be seen as expressions of objectivity or “truth” any more than spoken words (Bell & Davison, 2012; Pink, 2020), which is also an important starting point for discourse analysis, calling for a certain modesty in our analytic claims (Tonkiss, 1998, p. 260).

Finally, graphs or word clouds that showed statistics, text, or numbers as well as logotypes (displaying discourses on marketing of organisations rather than work or labour market) were excluded. Table 1 shows what type of visual material was included:

Sources that were repeated on more than one search engine or appeared over several months were counted as separate hits. This means that one hit with many images could give a bias to the number of counts. However, as we were not conducting a quantitative but rather a qualitative analysis of the image material, the numbers of images in Table 2 are merely to show the richness of our empirical material:

In the set of data, we have both types of images: photographs and illustrations. Using the multitude of collected images we critically analysed the relation between particular recurring topics and reflected on the sense of repetition and absence of various topics. Building on the idea of our perception of the world as moulded by institutions of power (Foucault, 1977), we understand the approach to curating materials on the internet as a mirror of manifestations of power showing the future of work in a particular way. The topics occurring in visuals thus become micro-discourses performed online. They are often copied from popular culture and further replicated on the internet, and are, as such, interconnected, linked, shared, and quoted.

5. Findings - towards the future of work in images

One paradox in writing this text is the fact that when focusing on visual materials, we discuss it in writing. This is an ethical issue while working with pictures and photos. The material was collected in an open environment which is an important inclination for the study and confirms that everyone can be exposed to the pictures we have found (Ståhl & Kaihoviirta, 2019). It would be preferred to visualise the empirical material for the reader, but since we have collected materials from various sources, we cannot obtain reprint approvals. Further, as some pictures appear in several different contexts through the empirical material, some of the materials have been copied from other sources without specifying them, which further aggravates (our) problem. In order to display transparency towards the reader, a detailed description of the nature of the visual material will be outlined below as a visual exposé narrating “the future of work” online. Following is a discussion on what remains invisible, and what such a discursive constitution might bring to our collective understanding of societal development.

Table 1
Types of materials found during the data collection included or not in the analysis.

	YES	NO
Professionals (individuals or groups)	x	
Work contexts (offices, hospitals, schools, fields etc.)	x	
Artefacts (computer screens, robots, desks, beds, crop, animals)	x	
Experts (authors of texts, speakers at conferences)	x	
Old photos as contrast	x	
Graphs		x
Word clouds		x
Logotypes		x

Table 2
The total number of images in the empirical material.

YEAR	POLAND	SWEDEN
2018	360	298
2019	635	419
2020	276	168
2021	269	182
Total	1540	1067

5.1. An initial presentation of ‘the future of work’ in images

The initial analysis was related to the ways of presenting the subject of interest to us. This allowed for a preliminary division into two framings as shown on [Image 1](#).

Stylized situations mainly show people working individually or in teams, with or without machines like robots. *En face* portraits show predominantly photos of women and men, presented as experts in various events (individual shots or with participants before, during or after an event), this also applies to women and men who were interviewed as experts. Also, humanoid robots can be found, with highlighted emotions like anger or joy. Most of the materials are photos. Many images present recurring standard themes: individual office workers using a laptop or a smartphone, a notebook, a coffee cup, a plant in a pot.

Some images appear twice in the collected materials. This suggests that publishers use databases to illustrate their posts and articles. Following this observation, we used Google Lens (Google advertises this tool as: “Search what you see”). It turned out for example that many images used in our materials also appear in more articles on the internet (on other topics). This might mean that the strategies behind choosing visuals do not reflect specific motivation to use original images designed for a given content.

The second exploration of the visualisation of the empirical material is threefold:

Humans shown working individually are almost exclusively young (our interpretation of “young” in the visual material is aged approximately 25–40, of course this can be contested as a definition of the term, but the vast majority of the visual material displays humans who are fit, without wrinkles or grey hair, well dressed (in suits, dresses, formal or fashionable street style) and happy (with facial expressions of smiling or laughing). Also, robots show various facial expressions. Group work shows people discussing or working separately. Finally, the equipment and interiors displayed are in most cases bright, and comfortable (clean, well-lit, with armchairs, sofas, or ergonomic desks and chairs). Shots inside buildings are more common than outside. In the latter case, workers are usually wearing protective clothing, mainly helmets, suggesting construction work.

From 2021, find images showing on-line meetings. This applies to both the representations of workers who are alone in a space that looks like an office or home, and children during home schooling. Here, too, the interiors are bright and well-kept and mainly include images of content (smiling, happy), young-looking people. This is in line with previous research arguing that people often perceive the technological advance in a positive way (Makridis & Han, 2021). The ethnic diversity is like that in the materials from 2018 and 2019. Although the discourse on work *and* home and work *at* home is not new, in the material gathered home replaces the scenery for office work. This means a spatial shift caused by a tentative need and does not deepen the discussion on domestic working (e.g taking care of children) as part of the future of work.

5.2. Human and machine or human versus machine

To engage with dominant, intertextual discourses, representations of images that depict machines, including robots, deserve special attention, due to their repeated appearance in the empirical material. Several subgroups can be distinguished:

For simplicity we generalise both computers and robots as machines. Within this category we find a variety in the presence of non-humans (as shown on [Image 3](#)), divided into common images showing working stations with technical equipment, those showing machines in offices and factories (more spider-like than human) and those depicting humanoid robots similar to the human shape. In the first case, there is no competition, but cooperation, in which a person controls his/her computer or more sophisticated machines. Furthermore, often robots are doing dangerous tasks, replacing humans in highly standardised jobs (robots are shown indoors and outdoors, never wearing protective clothing). In some cases, humans are displayed as controlling the robot. For example, several people pose surrounding the machine, human figures being bigger than the robot.

Robots are often replaying emotions mirroring humans. An image illustrating the fear of the emerging robot era is depicted in an

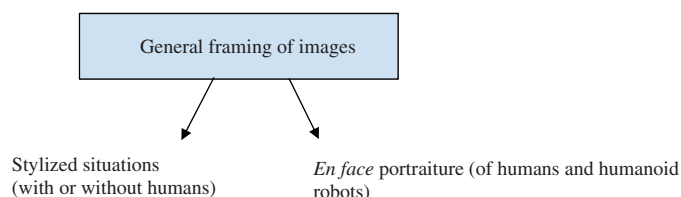


Image 1. General framing of the future of work.

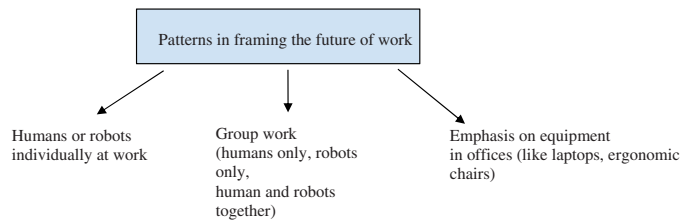


Image 2. Occurring patterns in framing the future of work in images.

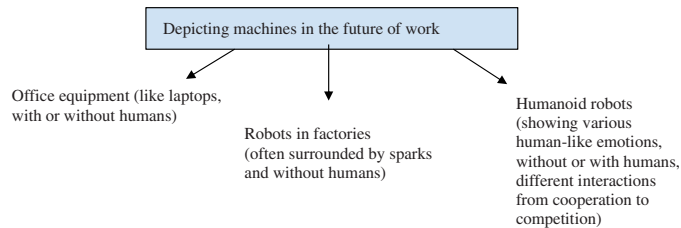


Image 3. Machines on the images showing the future of work. From laptops to sad humanoid robots.

illustration of a sad and tired-looking human worker hunched over, leaning on a broom, while next to him stands a triumphant robot in full strength with a broom. Another is a surveillance camera dressed in a suit, understood as a symbol of managerial surveillance evolving over time - from a real person to a machine. In some cases, people are dressed in protective clothing, while machines are not, displaying their adaptation to perform potentially dangerous tasks. In one photo a room is filled with screens showing only robots. Further we find a reference to the famous painting *The Creation of Adam* by Michelangelo - a robot's hand touching Adam's finger with its index finger. In this approach, the robot's hand replaces God's hand, displaying the seriousness and perceived inevitably that technology has on the impact on humans in the labour market.

The hand as a symbol, an etymological source of the word "management" itself (Latin: *manus* - hand) also occurs in the case of a robot holding a thumb up. Showing the hand can be considered as not accidental. Human manual abilities determine evolutionary development. It can be assumed that when robots develop the ability to efficiently use the hand and thumb, they will be able to take over numerous human tasks. Further, a reference to the famous photo *Lunch atop a Skyscraper* (1932), the authorship attributed to Charles Clyde Ebbets. Here, humans are replaced by robots sitting in the sky during a lunch break. These robots are not only taking over dangerous work but show a spirit of collectively. They enjoy being together and their break (which means they need it for some

Table 3

Topics occurring in the images.

Tools	<ul style="list-style-type: none"> related to the profession in question, for example, scissors in the case of hairdressers as a profession that is to disappear a protective helmet - a symbol of human work, sticky notes, to illustrate workshops and creative processes (on boards, group work diagrams), serving as to-do lists,
Symbols	<ul style="list-style-type: none"> bitcoin mark money (coins, bank notes) the "future" button, the inscription "future" in an open notebook, paper airplanes - flying towards the future, also paper as a typical office material, sometimes replaced by electronic notebooks, e-mails, etc. pyramids - unclear connection, might be understood as ability to create something unique, university diplomas, graduate caps, lecture halls, boards written with mathematical formulas - in articles about fields of study that are worth choosing and those that it is better not to choose wooden blocks used to form words, for example the word "job", light bulbs - a symbol of new ideas, interlocking rings - relationships between performed tasks, clocks - a reference to the future as a time perspective, arrows - showing the direction of development, magnets - to attract money, savings boxes - because the future hides many surprises and uncertainties, SDGs - as an illustration of the goals to be achieved in 2030 exiting computer screens - email symbols "leaving" the computers, flag of the European Union, foreign languages - the same word written in different languages
Actions	<ul style="list-style-type: none"> people standing in queues - for instance at employment offices, stairs to climb up - young (with fit bodies, without wrinkles or grey hair) people or humanoid robots jumping to reach a higher career level, conversations between young (see above), well-dressed (in suits or dresses) colleagues, often pointing to something indefinite with hand humans, with facial expressions of looking happy or engaged
Aesthetics	<ul style="list-style-type: none"> interiors of buildings - factories and offices, some clearly futuristic

reason). There are also some attempts to show artificial intelligence (illustrating topics such as big data, machine learning, and algorithms). Simply put, these symbols are shown as machines, mainly robots or as “phenomena coming out of computer screens”, which is to emphasise the fact that technology is all around us (like cloud computing). This overview visualises (in text) how the empirical material reflects wider societal images from related (and unrelated) social contexts.

5.3. Recurring elements

The recognition of patterns is crucial for the exploration of how a phenomenon is discursively constructed (Rose, 2022), presented and thus socially accepted. As various elements repeat throughout the material, this observation confirms what is often reported in scientific literature that in scenarios or narratives it is possible to find archetypes (MacDonald, 2012; Fergnani & Song, 2020; Lee, 2021). As a complement to the observations mentioned earlier, we have added a table with categories observed. At this stage, for the sake of clarity, we organised our findings around four themes.

The most common visuals were associated with symbols with universal meanings. Icons like paper airplanes or light bulbs are often used in visual languages and should simplify communication. For this reason, visual symbols have become so popular in social media and the entire digital culture (Karimova, 2020). On the other hand, all symbols we included in the overview can also be ambiguous or biased and do not lead to obvious interpretation. For example, pyramids might have various meanings as can money, but even the aforementioned light bulbs can evoke various messages depending on the framing and individual emotions - from new unique ideas to the risk of blackouts or energy poverty in the future. Furthermore, they can inform us about concrete ideas and meanings or signalise the lack of them. Thus, recurring symbols include complex messages, and they can be used for various purposes, even though they are often taken for granted as icons or emojis representing the new generation of non-verbal messages (Alshenqeeti, 2016). Also, the category of tools is interesting from the discursive point of view. Just as polar bears have become a symbol of climate change (Born, 2019), sticky notes represent work, to-do lists, brainstorming, and the openness to co-create. But the overall framing could also be about the mistrust of brainstorming, resistance to bottom-up perspectives in decision-making processes, and much more besides. Furthermore, the first association of a protective helmet is often safety, but this could also represent an accident. Two other categories we have identified are surprisingly easier to understand. Emotions of people (like laughing) are clearly communicated. And the last category “aesthetic” is rather related to individual perception. Framing as a strategy also turns out to be important in dealing with simple, recurring elements used on the internet (Rodrigues & Dimitrova 2016). It might reveal motivations of the content managers and decisions on showing and hiding particular images, simplifying them or even playing intentionally with ambiguity.

The above remarks are related to the comparative approach to data obtained in both countries. In most cases in Poland and in Sweden, online articles are supplemented with images based on simplifications. The above-mentioned four themes, with recurring motifs are present in material from both countries. This shows that visual narratives on the Internet illustrating discussions about the future of work have a universal dimension, and the local context only slightly influences them.

The few differences in the images collected in Polish and Swedish websites concern a larger number of shots in the natural environment and the representation of farmers, construction workers and engineers at work in the Swedish material. In the Polish material, however, there were more often representations of individual professions, potentially at risk of disappearance (e.g. veterinarian, laboratory worker, chemist).

6. Discussion: visibility and invisibility in the future of work

In line with the critical discourse framework, visuals are produced by and reproduce particular knowledge about the world (Rose, 2022), without claims of this knowledge revealing true intentions (Ainsworth & Hardy, 2004). Instead, our research interest is to trawl the different search engines in order to gain a wide impression of how the discursive constructions of “the future of work” are legitimised - and legitimising themselves (cf. Gill, 1996). In particular, discussions will focus on visibility, as well as what remains invisible (Ryan-Flood & Gill, 2013) in relation to the discursive construction of the future of work. In general, we can speak of a uniform, mainstreamed nature of all the collected material. In this homogenous discursive construction across countries, dystopian images contain robots, often shaped as slim, and edgy creatures/devices punching or surveilling. Utopian images contain robots with rounder shapes, with humanlike facial expressions, waiting for human commands or helping in human labour. However, it is important to pay attention to the holistic way of presenting the future of work in a visual form. Visions of the future of work not only attempt to show the relationship with robots, but predominantly stereotypical motifs and symbols - helmets, sticky notes, laptops, and interiors of office buildings, often replaced by the interiors of houses. Interestingly, both offices and private homes are neat and tidy. As if during a pandemic, both private and professional roles ran smoothly, without clutter, frustration or domestic work.

In the collected images, work is visualized in different settings such as in the home office, in designed office spaces, robotized industry, farming or health care organisations focusing on humans as health care personnel often aided by digital tools. Even as work *from* home is presented, human work *at* home is largely invisible, displaying work as separated from domestic chores and reproducing work as performed in the public sphere of life. This binary divide between public and private spheres of life originating from the Enlightenment (Horkheimer & Adorno, 1972) has discursively separated the home (and work done in the home) from the public. In rural labour markets through history, family and work was integrated, spanning over generations. Further work that is shown in the visual material privileges office work through images of office interiors, laptops and office supplies such as post-its. This privileging of work in the middle-income segment of the labour market is interesting, as it is predicted that many such jobs will be affected by AI in a first wave of digitalization (Autor & Dorn, 2013), whereas it is predicted that low-income service sector jobs will maintain manual labour on a larger scale (Goos & Manning, 2007; Autor & Dorn, 2013). Low-income jobs were only occasionally present in the material

(for instance in the image of a man with a broom). As we have intentionally not introduced any specific restrictions to the search criteria, it would appear that the media are targeting the readers interested in the topic of the future of work. This produces a discursive understanding of the future of work with a specific construction of the labour market to take place in the middle-income segment. Moreover, based on the images analysed, social identities that fit with this image of the future are assumed to have digital capacity and skills, possibly excluding humans with less capacity and skills.

The gender balance in the visual material does not display a bias towards either of the sexes. In the visual material women are represented as doctors, engineers or construction workers, as are men, although less frequently in total. However, the display of work and professional categories privileges certain types of work over others. Domestic work (or 'consumption work', Huws, 2014, p. 7) has throughout history been women's labour. Today in both Sweden and Poland most domestic work is done separately from the labour market during an individual's free time, including the use of an increasing number of cooking and cleaning machines. However, domestic chores can also be part of the labour market, often performed by the maid and/or the immigrant woman (Rappe & Stranegård, 2004). In Sweden paid domestic human labour is even supported financially through political initiatives (the Swedish Tax Agency, 2002). In the visual material working from or in the home was displayed mainly as men or women working with laptops in home settings, sometimes with children playing by the side. During the COVID-19 pandemic, work was again integrated into homes on a large scale. The majority of images show bright and clean homes without clutter, tensions or frustration over the invasion of one sphere of life by another. The home office is thus an office rather than a home. This representation of office work (done in offices or homes) over other types of jobs such as domestic, cleaning or childcare work produces an image of future workers as mainly office workers despite the truth of where they are visually located (in spaces looking like home but without its authenticity or co-working hubs). We are left wondering who cleans these neat homes. After all, invisibility is as powerful as visibility in the formation of our socially shared experiences of discourse (Billig, 1991; Ryan-Flood & Gill, 2013). It is our belief that the invisibility of some labour, as well as some workers, might affect the next generation in their perception of possible trajectories in their choices in the labour market, and more importantly, can further make political inequalities of 'the Second Machine Age' labour market invisible (Spencer, 2017).

In the visual material, a diversity of young individuals with different skin colours points to a global world of work. This applies for both countries, although Sweden is clearly more multicultural than Poland. Apparently, images databases are not tailored to reflect local demographic structures when it comes to origin. However, interestingly, diversity does not visualise an elderly or middle-aged workforce in the same manner. With the threat of a future with less jobs or with jobless growth (Frey & Osborne, 2017; Brynjolfsson & McAfee, 2011) it is possible that a discursive production of a future labour market that mainly includes younger workers is less threatening than a presentation where mainly older workers have jobs and younger ones are excluded from the labour market through the influx of AI and machines. The exploration of young, happy workers who repeatedly appear in the visual materials can be seen as a presentation of youth as a discourse of desirability. However, the future might hold an even wider diversity of ages, as there is in society today, as it is probable that the population in Europe will have an even wider age spread.

In light of the frequent representation of robotization (for instance robots crushing humans or taking over jobs such as the lunch-eating robots in the skyscraper) the presentation of a homogenous young workforce becomes interesting. Today the earliest age for receiving a state pension in Sweden is 62 years old, but a political debate about pushing this age upwards is flourishing (Swedish Pensions Agency, 2022). In Poland the earliest retirement age is 60 years for women and 65 for men and is a constant topic of political discussion. Scholars, such as Standing (2011, 2014) claim that political and structural changes in working life have a larger impact on employment than digitalization. Considering these political and academic discussions, the invisibility of an ageing workforce in images of the future of work is striking, where discourse is constructed through what is *not* visualised (Billig, 1991; Ryan-Flood & Gill, 2013), and acknowledging invisibility helps point out dilemmas and issues relevant for our understanding of matters of inclusion in society (Gill & Ryan-Flood, 2008). In this context the question of who produces the images and what intentions are driving them to choose a specific visual content are crucial. These decisions might be understood as political since they generate specific understanding of the future, empower some groups, shape the image of the future (Shefrin, 1986) and since the foresight via visuals can contribute to policy-related impact (Rhisiart et al., 2017). Nevertheless, it is also possible that the images are chosen without specific goals, which would explain the often-recurring simplification and repetitiveness of framing strategies.

7. Conclusion

The discursive construction of the future is a product of the present as well as imagination. Based on our experiences (as humans) of the shifting nature of work and the impact of our material surroundings and tools (steam, electricity, electronics, IT, robots, AI and so forth, cf. Schwab, 2017; Simon et al., 2020) our fears and hopes are moulded by institutions of power (Foucault, 1977), which integrate the notion that where there is power, there is resistance (Foucault, 1979). Thus, analysis cannot rest solely on discourse in itself, but on "relations between discourse and other objects, elements or moments" (Fairclough, 1995, p. 4, italics in original). In the visual display of the future of work, particular work and particular humans are represented; predominantly young, happy workers in middle-income jobs in tidy offices or working *from* home are present, but middle aged and older workers, lower-income manual as well as human work *at* home are largely invisible, displaying work as separated from manual and domestic chores and reproducing work as performed in the public sphere of life by a young population. Based on these observations, we claim that there is a surprising synergy in creating the visual discourse on the future of work. Content producers decide both what to show and what not to show. In the next step, the same decision, just before delivering the content to the recipient, is made by algorithms. This would suggest shared power and something which has not been investigated so far, shared responsibility.

Dystopian visions of the future of work in popular culture (as well as in academic and political discussions) is often related to unemployment on a large scale (Czarniawska & Jorges, 2020). In countries experiencing a high degree of work life stress, in a world

where one of humans' greatest fears is the rapid loss of jobs, especially among the middle-income younger population, the massive representation of young, happy, relaxed office workers in the image material is striking, and possibly soothing. The absence of middle-aged and older workers smooths the perceived fear of an ageing population holding on to jobs and preventing young employees from entering a future labour market where computers, machines, robots and AI have made human labour superfluous. At the same time, the question of how the work of older employees should look remains unanswered.

A final conclusion of this study is the absence of leisure and humans enjoying a jobless future - images of humans as useful and fulfilled without work in the future (cf. [Suskind, 2020](#)). If robots are taking over human labour, how can we envision a future where those that are children today become included, experience meaning and feel financial security without work? As mentioned before, the visions presented are mostly quite standardised and recurrent. Paradoxically, they often lack imagination and creativity. Thus, the analysis conducted shows that the topic of the "future of work" is presented on the internet in a pragmatic way and does not create any scenarios of alternative futures. The analysis corresponds to previous claims of work to be understood as a prevailing societal ideology ([Paulsen, 2010](#)). Even if human labour is not needed for the survival of humanity (if the amount of work needed could be done by robots and other machines enabled by AI), human engagement in work is deeply intertwined in social constructs of meaning, community, acceptance, wellbeing, and self-worth, which engage humans to proceed with the quest to be part of the labour market and to engage in making new jobs appear as others disappear. Thus, the discussion is political as it touches upon the construction of the labour markets of tomorrow and the workforces that should and should not be part of it. Furthermore, the future of work is a continuation of what we tend to understand now although new ways of living might appear. Our findings correspond to previous scholars highlighting sought after futures literacy for contents of responsible capitalism and increased socially sustainable in business education, and thus for the future of management ([Spanjol et al., 2023](#)).

As we end, we must state the limitations of our research. Despite the limited time and linguistic scope, it can be assumed that the results that we obtained would differ from those that would be received by two other researchers from Poland and Sweden, even if the same search criteria on the internet were adopted ([Metzger et al., 2010](#); [Wasserman & Richmond-Abbott, 2005](#)). We have described the results of adapting specific strategies in searching for information on the internet. Nevertheless, search engines match the content based on their own algorithms ([Pan et al., 2007](#); [Van Dijck, 2010](#); [Wallace, 2016](#)). Therefore, the analysis is selective in nature. However, it may be an introduction to further research on the development of visions about the future of work, which are published in the media using images that complement, but often also fully replace, the written word. Thus, the role of media and of visual materials in developing this discussion is crucial and impactful.

Finally, we hope that our critical discourse analysis will inspire further contributions to the visual, pictorial or iconic turn ([Jay, 1996](#); [Jay, 2002](#); [Mitchell, 2018](#); [Moxey, 2008](#)) and that the transparency displayed on how to select and analyse visual data can add to the still fairly slim supply of visual method examples in management research ([Bell & Davison, 2012](#)) organisation studies ([Styhre, 2010](#)) and the sociology of work ([Strangleman, 2004](#)).

Funding

Financing by the *Digitized management – what can we learn from England and Sweden?-program* (DIGMA), financed by FORTE (grant no: 2016-07210).

The publication has been supported by a grant from the Faculty of Management and Social Communication under the Strategic Programme Excellence Initiative at Jagiellonian University.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Data Availability

The authors do not have permission to share data.

Acknowledgements

As authors, we extend our sincere appreciation to Barbara Czarniawska and Emma Bell for their support and invaluable guidance during the development of this paper. We also want to express our gratitude to the diligent reviewers who provided us with thoughtful comments and suggestions. Your contributions have greatly improved the quality of our paper. We thank all of you for your support and dedication to advancing our work.

References

- Alshenqeeti, H. (2016). Are emojis creating a new or old visual language for new generations? A socio-semiotic study. *Advances in Language and Literary Studies*, 7(6) (Available at SSRN) <https://ssrn.com/abstract=3709343>.
- Aronowitz, S., & DiFazio, W. (1994). *The jobless Future* (2nd ed.). Minnesota, USA: University of Minnesota Press.
- Autor, D. H., & Dorn, D. (2013). The growth of low-skill service jobs and the polarisation of the US labor market. *American economic Review*, 103(5), 1553–1597. <https://doi.org/10.1257/aer.103.5.1553>

- Bell, E., & Davison, J. (2013). Visual management studies: Empirical and theoretical approaches. *International Journal of Management Reviews*, 15(2), 167–184. <https://doi.org/10.1111/j.1468-2370.2012.00342.x>
- Bellacasa, M. P. de la (2017). *Matters of Care: Speculative Ethics in More than Human Worlds*. Minnesota, USA: University of Minnesota Press.
- Bilić, P. (2016). Search algorithms, hidden labour and information control. *Big Data & Society*, 3(1). <https://doi.org/10.1177/20539517166652159>
- Billig, M. (1991). *Ideology and Opinions: Studies in Rhetorical Psychology*. London: SAGE.
- Bolger, N., & Laurenceau, J. P. (2013). Intensive longitudinal methods. *An introduction to diary and experience sampling research*. New York, NY: Guilford.
- Born, B. (2019). Bearing witness? Polar Bears as icons for climate change communication in *National Geographic*. *Environmental Communication*, 13(5), 649–663. <https://doi.org/10.1080/17524032.2018.1435557>
- boyd, d., & Crawford, K. (2012). Critical questions for big data. *Information, Communication & Society*, 15(5), 662–679. <https://doi.org/10.1080/1369118X.2012.678878>
- Brynjolfsson, E., & McAfee, A. (2011). *Race against the machine: How the digital revolution is accelerating innovation, driving productivity, and irreversibly transforming employment and the economy*. Lexington, USA: Digital Frontier Press.
- Brynjolfsson, E., & McAfee, A. (2014). The second machine age: Work, progress, and prosperity in a time of brilliant technologies. New York-London, WW Norton & Company.
- Carroll, N., & Conboy, K. (2020). Normalising the “new normal”: Changing tech-driven work practices under pandemic time pressure. *International Journal of Information Management*, 55, 1–6. <https://doi.org/10.1016/j.ijinfomgt.2020.102186>. <https://www.sciencedirect.com/science/article/pii/S0268401220310252>
- Czarniawska, B., & Joerges, B. (2020). Robotization of Work? Answers from Popular culture. *Media and Social Sciences*. Cheltenham, UK: Edward Elgar Publishing Inc. <https://doi.org/10.4337/9781839100956>
- Dagan, A., Guy, I., & Novgorodov, S. (2023). Shop by image: Characterising visual search in e-commerce. *Information Retrieval Journal*, 26(2). <https://doi.org/10.1007/s10791-023-09418-1>
- Dator, J. (2019). *Jim Dator: A Noticer in Time: Selected Work* (Vol. 5, pp. 1967–2018). Springer International Publishing.
- Datta, R., Joshi, D., Li, J., & Wang, J. Z. (2008). Image retrieval: Ideas, influences, and trends of the new age. *ACM Computing Surveys*, 40(2), 1–60. <https://doi.org/10.1145/1348246.1348248>
- Dwivedi, Y. K., Kshetri, N., Hughes, L., Slade, E. L., Jeyaraj, A., Kar, A. K., Baabdullah, A. B., Koohang, A., Raghavan, V., Ahuja, M., Albanna, H., Albashrawi, M. A., Al-Busaifi, A. S., Balakrishnan, J., Barlette, Y., Basu, S., Bose, I., Brooks, L., Buhalis, D., & Ryan, Wright (2023). “So what if ChatGPT wrote it?” Multidisciplinary perspectives on opportunities, challenges and implications of generative conversational AI for research, practice and policy. *International Journal of Information Management*, 71, Article 102642. <https://doi.org/10.1016/j.ijinfomgt.2023.102642>
- Fairclough, B. (2010). *Critical Discourse Analysis. The Critical Study of Language*. New York: Routledge.
- Fergnani, A., & Song, Z. (2020). The six scenario archetypes framework: A systematic investigation of science fiction films set in the future. *Futures*, 124, 1–21. <https://doi.org/10.1016/j.futures.2020.102645>
- Fleming, P. (2019). Robots and organization studies: Why robots might not want to steal your job. *Organization Studies*, 40(1), 22–37. <https://doi.org/10.1177/0170840618765568>
- Frey, C. B., & Osborne, M. (2017). The future of employment. *Technological Forecasting and Social Change*, 114, 254–280. <https://doi.org/10.1016/j.techfore.2016.08.019>
- Foucault, M. (1977). *Discipline and punish: The birth of the prison*. Allen Lane.
- Foucault, M. (1979). The history of sexuality. In *An introduction* (Volume I). Allen Lane.
- Gall, T., Vallet, F., & Yannou, B. (2022). How to visualise futures studies concepts: Revision of the futures cone. *Futures: the Journal of Policy, Planning and Futures Studies*, 143. <https://doi.org/10.1016/j.futures.2022.103024>
- Gill, R. (1996) Discourse analysis: Practical implementation., in J T E Richardson (ed.) *Handbook of Qualitative Methods for Psychology and the Social Sciences*. British Psychological Society. pp. 141–156.
- Gill, R., & Ryan Flood, R. (2008). Editor’s Introduction: Secrecy and Silence in Research: Opening up the Debates. In *Feminism & Psychology*, 18 pp. 381–383.
- Goos, M., & Manning, A. (2007). Lousy and lovely jobs: The rising polarization of work in Britain. *The Review of Economics and Statistics*, 89(1), 118–133. <https://doi.org/10.1162/rest.89.1.118>
- Green, N. (1990). The spectacle of nature. *Landscape and bourgeois nature in nineteenth-century France*. Manchester University Press.
- Gusenbauer, M. (2019). Google Scholar to overshadow them all? Comparing the sizes of 12 academic search engines and bibliographic databases. *Scientometrics*, 118, 177–214. <https://doi.org/10.1007/s11192-018-2958-5>
- Hajian, S., Bonchi, F., Castillo, C. (2016) Algorithmic Bias: From Discrimination Discovery to Fairness-aware Data Mining. In Proceedings of the 22nd ACM SIGKDD International Conference on Knowledge Discovery and Data Mining (KDD ’16). Association for Computing Machinery, New York, NY, USA, 2125–2126. <https://doi.org/10.1145/2939672.2945386>
- Horkheimer, M., & Adorno, T.W. (1972) *Dialectic of Enlightenment*. Seabury Press New York.
- Huws, U. (2014). *Labor in the Global Digital Economy*. New York: Monthly Review Press.
- Hyun, C., Hur, C., & Park, H. (2022). An image selection framework for automatic report generation. *Multimedia Tools and Applications*, 81, 41175–41197. <https://doi.org/10.1007/s11042-022-13120-7>
- Jansen, B. J., & Spink, A. (2006). How are we searching the World Wide Web? A comparison of nine search engine transaction logs. *Information Processing & Management*, 42(1), 248–263.
- Jay, M. (1996). Vision in context: Reflection and refractions. In Brennan, Teresa, & Jay, Martin, eds.. *Vision in context: Historical and contemporary perspectives on sight* (pp. 1–12) New York & London: Routledge., in Brennan, Teresa, & Jay, Martin, eds.
- Jay, M. (2002). That visual turn. *Journal of Visual Culture*, 1(1), 87–92. <https://doi.org/10.1177/147041290200100108>
- Jenks, C. (2002). *Visual culture*. Routledge.
- Jones, S. E. (2006). *Against. Technology. From the Luddites to Neo-Luddism*. New York: Routledge.
- Karimova, G. (2020). Exploring Visual Framing Strategies, Sentiment, and Product Presentation Modality in Instagram Posts of Fashion Influencers. *Res Rhetorica*, 1, 86–106. <https://doi.org/10.29107/tr2020.1.6>
- Keynes, J. M. (1930). Economic possibilities for our grandchildren. *Essays in persuasion*, 358–373.
- Kunter, A., & Bell, E. (2006). The promise and potential of visual organizational research. *Megy@N@gement*, 9(3), 177–197. <https://doi.org/10.3917/mana.093.0177>
- Lee, T. (2021). Beyond archetypes: Advancing the knowledge of narrative fiction in future scenarios. *Futures*, 132, Article 102779. <https://doi.org/10.1016/j.futures.2021.102779>
- Leontief, W., & Duchin, F. (1986). *The future impact of automation on workers*. New York: Oxford University Press.
- MacDonald, N. (2012). Futures and culture. *Futures*, 44(4), 277–291. <https://doi.org/10.1016/j.futures.2011.10.011>
- Makridakis, Ch. A., & Han, J. H. (2021). Future of work and employee empowerment and satisfaction: Evidence from a decade of technological change. *Technological Forecasting and Social Change*, 173, Article 121162. <https://doi.org/10.1016/j.techfore.2021.121162>
- Mariani, M. (2019). What Images Really Tell Us. *Visual Rhetoric in Art. Graphic Design and Advertisement*. Barcelona: Hoaki.
- Metzger, M. J., Flanagin, A. J., & Medders, R. B. (2010). Social and heuristic approaches to credibility evaluation online. *Journal of Communication*, 60(3), 413–439. <https://doi.org/10.1111/j.1460-2466.2010.01488.x>
- Mitchell, W. J. (2018). Pictorial turn. In R. Bleiker (Ed.), *Visual Global Politics* (pp. 230–232). Routledge.
- Moxey, K. (2008). Visual studies and the iconic turn. *Journal of Visual Culture*, 7(2), 131–146. <https://doi.org/10.1177/1470412908091934>
- Negi, Y. S., & Kumar, S. (2014). A Comparative Analysis of Keyword- and Semantic-Based Search Engines. In D. P. Mohapatra, & S. Patnaik (Eds.), *Intelligent Computing, Networking, and Informatics. Advances in Intelligent Systems and Computing* (vol 243). New Delhi: Springer. https://doi.org/10.1007/978-81-322-1665-0_73.

- Nurrosyidah, A., & Wang, W.-T. (2023). Development of a visual search service effectiveness scale for assessing image search effectiveness: A behavioral and technological perspective. *International Journal of Human-Computer Interaction*. <https://doi.org/10.1080/10447318.2023.2197535>
- OECD (2021) Labour force participation rate. Retrieved 2023-02-01 from <https://data.oecd.org/emp/labour-force-participation-rate.htm>.
- Oliver Schwarz, J. (2008). Assessing the future of futures studies in management. *Futures: the Journal of Policy, Planning and Futures Studies*, 40(3), 237–246. <https://doi.org/10.1016/j.futures.2007.08.018>.
- Pan, B., Hembrooke, H., Joachims, T., Lorigo, L., Gay, G., & Granka, L. (2007). In Google we trust: Users' decisions on rank, position, and relevance. *Journal of computer-mediated Communication*, 12(3), 801–823. <https://doi.org/10.1111/j.1083-6101.2007.00351.x>
- Parenti, C. (2001). Big brother's corporate cousin. *The Nation*, 273(5), 26–31.
- Paulsen, R. (2010). Arbetssamhället: hur arbetet överlevde teknologin. [The Working Society: how Work survived Technology]. Gleerups Utbildning AB.
- Pariser, E. (2011). *The Filter Bubble: What the Internet is Hiding from You*. London: Penguin.
- Paus, E. (2018). The Future isn't what it used to be. In E. Paus (Ed.), *Confronting dystopia: The new technological revolution and the future of work*. Cornell University Press. <https://doi.org/10.1177/0022185620944292>.
- Pink, S. (2020). Doing visual ethnography. Sage. <https://doi.org/10.4135/9780857025029>
- Potter, J. (1996). *Representing reality - discourse, rhetoric and social construction*. SAGE publication.
- Potter, J., & Wetherell, M. (1994). Analyzing discourse. In A. Bryman, & R. G. Burgess (Eds.), *Analyzing Qualitative Data* (pp. 47–66). Routledge.
- Rhisiart, M., Störmer, E., & Daheim, C. (2017). From foresight to impact? The 2030 Future of Work scenarios. *Technological Forecasting and Social Change* (vol 124,, 203–213. <https://doi.org/10.1016/j.techfore.2016.11.020>
- Rifkin, J. (1995). *The end of work: The decline of the global labor force and the dawn of the post-market era*. New York: G. P. Putnam's Sons. <https://doi.org/10.1080/00213624.1996.11505884>
- Rogers, R. (2023). Algorithmic probing: Prompting offensive Google results and their moderation. *Big Data & Society*, 10(1). <https://doi.org/10.1177/20539517231176228>
- Rose, G. (2022). *Visual Methodologies: An Introduction to Researching with Visual Materials*. 5th edition. SAGE.
- Ryan-Flood, R., & Gill, R. (2013). *Secrecy and silence in the research process: Feminist reflections*. London: Routledge.
- Schwab, K. (2017). *The fourth industrial revolution*. Currency.
- Shefrin, B. M. (1986). Images of the future, futuristics and American politics. *Technological Forecasting and Social Change*, 30(3), 207–219. [https://doi.org/10.1016/0040-1625\(86\)90042-9](https://doi.org/10.1016/0040-1625(86)90042-9)
- Simon, O., Neuhofer, B., & Egger, R. (2020). Human-robot interaction: Conceptualising trust in frontline teams through LEGO® Serious Play®. *Tourism Management Perspectives*, 35, Article 100692. <https://doi.org/10.1016/j.tmp.2020.100692>
- Smith, B. Q. (2006). Outsourcing and digitized work spaces: Some implications of the intersections of globalization, development, and work practices. *Journal of Adolescent & Adult Literacy*, 49(7), 596–607. <https://doi.org/10.1598/JAAL.49.7.5>
- Spanjol, J., Rosa, A., Schirrmeyer, E., Dahl, P., Domnik, D., Lindner, M., de la Cruz, M., & Kuhlmann, J. F. (2023). The potential of futures literacy for impact-Oriented business schools. *Futures*, 146, Article 103084.
- Spencer, D. (2017). Work in and beyond the Second Machine Age: The politics of production and digital technologies. *Work, Employment and Society*, 31(1), 142–152. <https://doi.org/10.1177/0950017016645716>
- Ståhl, M., & Kaihovirta, H. (2019). Exploring visual communication and competencies through interaction with images in social media. *Learning, Culture and Social Interaction*, 21, 250–266. <https://doi.org/10.1016/j.lcsi.2019.03.003>
- Standing, G. (2011). *The precariat: The new dangerous class*. London and New York: Bloomsbury Academic.
- Standing, G. (2014). *A precariat charter: From denizens to citizens*. A&C Black.
- Standing, G. (2017). *Basic income*. Yale University Press.
- Steyaert, C., & Janssens, M. (2013). Multilingual scholarship and the paradox of translation and language in management and organization studies. *Organization*, 20(1), 131–142.
- Strangleman, T. (2004). Ways of (not) seeing work: The visual as a blind spot in WES. *Work, Employment and Society*, 18(1), 179–192. <https://doi.org/10.1177/0950017004040768>
- Styhre, A. (2010). *Visual culture in organizations: Theory and cases*. Routledge. <https://doi.org/10.4324/9780203848685>
- Susskind, D. (2020). *A world without work*. Penguin Books.
- Swedish Pensions Agency (2022) Höjd pensionsålder [Increased retirement age] Retrieved 20220524 from <https://www.pensionsmyndigheten.se/ga-i-pension/planera-din-pension/hojd-pensionsalder>.
- Swedish Tax Agency (2002). Skatteverket Rotarbete och Rutarbete [Tax Agency ROTwork and RUTwork]. Retrieved 20220311 from <https://www.skatteverket.se/privat/fastigheterochbostad/rotarbeteochrutarbete.4.2e56d4ba1202f95012080002966.html>.
- Tonkiss, F. (1998). Analyzing discourse. In C. Seale (Ed.), *Researching Society and Culture* (pp. 245–260). Sage.
- Van Dijk, J. (2010). Search engines and the production of academic knowledge. In *International journal of cultural studies*, 13 pp. 574–592.
- Wasserman, I. M., & Richmond-Abbott, M. (2005). Gender and the Internet: Causes of variation in access, level, and scope of use. *Social Science Quarterly*, 86(1), 252–270. <https://doi.org/10.1111/j.0038-4941.2005.00301.x>
- Wallace, D. (2016). Words as keys to the image bank. In C. Bailey, & H. Gardiner (Eds.), *Revisualizing Visual Culture* (pp. 105–118). Routledge.
- Wetherell, M. (1998). Positioning and interpretative repertoires: Conversation analysis and post-structuralism in dialogue. *Discourse & Society*, 9(3), 387–412.
- Wiggins, S. (2017). *Discursive Psychology theory, method and applications*. SAGE.
- Zagalo, N., & Branco, P. (2015). *Creativity in the digital age*. Springer. <https://doi.org/10.1007/978-1-4471-6681-8>