

Limits of inclusion: multimodal action-nets and the challenge of communication technologies for disability*

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Abstract

This paper investigates the effects that the extensive use of communication technologies, fostered by the pandemic, has on organizational inclusion. It is an explorative study that offers theoretical reflections supported by analysis of interviews and journalistic reports of disabled people's experience with communication technologies and assistive devices. We argue that such technology, although able to foster unexpected changes in work activities, is not inclusive in itself, as it can also produce errors, malfunctions, frustrations, misnarration. Therefore, we propose a relational approach that sees inclusion not in terms of the adoption of single accessibility devices, nor of specific policies in HR management, but rather as a dynamic process characterized by multimodal action-nets, composed of multiple socio-material agents and nodes, both human and non-human, and complex interdependencies between individuals, public and private organizations, technological artifacts, design, IT services and data processing, hiring policies, knowledge and narratives. Such an approach highlights the fruitful connection between inclusion and resilience.

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1. Introduction

The pandemic has emphasized the crucial role of communication technologies in organizations. Nevertheless, growing use of digital technologies hasn't gone along with similar growth in equity and inclusion. This is not only because new forms of digital divide have emerged, but also because old barriers have not been completely overcome. Those barriers concern people with disability and their possibility to access and participate in organizational life in all its meanings, from workplaces to social activities to institutions and services (Sicca, 2022).

By pushing many organizations to rely on communication technologies which are inherently designed to assist disability (also known as assistive technologies), Covid-19 has made everybody more aware of the limits and frustrations many disabled people experience on a daily basis (Shew, 2020). Failures, glitches, interference and noise in media affect our agency and our experience of the world (Appadurai & Alexander, 2019), and as such, play a key role in inclusivity.

The purpose of this paper is to investigate the effects that the extensive use of communication technologies has on organizational inclusion of disabled people. In particular, we argue that inclusion is characterized by multimodal networks of individuals, technologies, organizations and narratives. Considering technology not as a mere tool, but as a social actor that is part of a wider network, we highlight how such technology can contribute to trigger unexpected changes in work activities, both in terms of the new possibilities and expectations it generates and for the errors, malfunctioning, frustrations, misnarration it produces. In any case, we underline how technology is not in itself inclusive. Studies of organizational inclusion too often focus on the inclusive potential of single practices and policies in HR management, or on the adoption of technological solutions, overlooking the networks in which those practices are immersed. We argue that these approaches suffer from simplistic or solutionist narratives which constitute a limit to a proper understanding of organizational inclusion and its complexity. In contrast, we propose to read dynamics of inclusion of disabled people in organizations as action-nets (Czarniawska, 2014). In particular, we aim to expand on this conceptual tool by theorizing *multimodal action-nets* as interdependent networks characterized by multiple socio-material agents and nodes, both human and non-human, and multiple material and semiotic modes of presentation.

This is an explorative study that offers theoretical and critical reflections supported by initial-stage empirical research. It uses both primary and secondary sources, crossing interviews with descriptions of disabled people's experience with communication and media technologies as reported in newspapers and magazines. Our study has focused on communication devices designed to support people with different kinds of disability, also known as communication aids or assistive

technologies, which have seen ever-greater use in everyday working practices. These tools include telepresence and virtual conferences, as well as sonic feedback for blind people, screen readers, virtual assistants and Internet of Medical Things (IoMT).

In contrast with both medical-solutionist models which see disability as a pathology which can be “fixed” through technology, and social models which see disability as an effect of social injustice (Oliver, 1996; Shakespeare, 2006; Siebers, 2008), this paper proposes a socio-material approach which considers the ways in which individuals, media technologies, organizational assets and narratives interact with each other. In this essentially relational perspective, disability has to be seen as the negotiation between disabled people's personal experiences with communication and assistive technologies and the nonhuman agencies of those very artifacts, which are designed by tech organizations and adopted by public or private organizations according to specific images, ideas and knowledge about disabled people's desires and needs. This network of socio-material agents is itself intertwined with other networks in which the adoption of technological solutions determines the interdependence of organizations, since devices, in order to work effectively, require connection to other IT services (such as geolocalization and data processing), modification and adaptation of their local constructed environment (such as the construction of ramps and curb cuts for wheelchairs, sonic traffic lights and tactile paths for blind people and so on), and maintenance. Eventually, this multimodal network determines whether disabled people will be hired (or not), and thereby included in (or excluded from) the very organizations which design or adopt such technological devices.

This investigation follows a methodological approach inspired by disability studies scholars such as Sterne (2021) and Alper (2017), who underline the importance of considering personal experiences of disabled people regarding both their relations with social and economic organizations and their relations with the technologies and prostheses on which they rely on a daily basis. We integrate this approach with the theoretical consideration that the relationship between media technologies and organizing can be read in a double sense: on one side media are imagined, designed, operated and transformed in the social context of organizations; on the other side are the media themselves, with their nonhuman agencies, wielding their own organizing power (Beyes et al., 2019). As said by Martin (2019), “media organize”.

After presenting the theoretical framework, the research methods and the findings, the final section of this paper discusses organizational inclusion – one of the main topics in contemporary organization's agenda – underlining its fruitful connection with the construct of resilience, especially in light of the often disruptive role played by media technologies. Inclusion, in fact, can be seen as a process of reconfiguration of the organizational and social context addressed to accommodate the instances coming from the margins (i.e. disabled people) (Sicca, 2016). As such, it is a dynamic process that not only attempts to resolve transformations, shocks and unexpected events, but at times even produces them. Resilience, on the other hand, following Weick and Sutcliffe (2015), is not to be intended as a restoration of a condition precedent to the shock, but as a transformation that preserves

organizational effectiveness as conditions vary. In this sense, resilience appears as a crucial instrument for the pursuit of inclusion.

2. Theoretical framework

2.1 Communication, organization and disability: a socio-material perspective

The importance of communication in organizations has been recognized since Karl Weick's seminal work (1995). In the last decade, the role of communication has seen even greater emphasis in scholarly works, being considered as "constitutive of organizations" (Putnam & Nicotera, 2009; Cooren et al., 2011). In this perspective, communication is not understood merely as the vehicle for the expression of pre-existing realities; rather, it is considered as the means by which organizations are established, composed, designed, and sustained. Consequently, scholars have given great consideration to both *processes* and *materialities* of communication which are essential to *organizing* (Joerges & Czarniawska, 1998; Czarniawska, 2014).

Media technologies are nowadays the main means by which communication is enacted, within organizations and without. As such, organization studies can benefit by contributions from media studies (Mills & Sterne, 2017; Sterne, 2021), especially with regard to the issue of disability (Ellcessor et al., 2017). The value of such dialogue is evident in the growing attention organization scholars are paying to socio-material practices of organizing (Orlikowski, 2007), in which humans are no longer the main social actor, while agency is shared in communicative assemblages made of both humans and nonhumans (Beyes et al., 2019). In this framework, media are being thought of less as conduits or channels connecting one agent with another, and more as structuring conditions configuring the very possibility of agency.

The communicational aspect of organizing is central when dealing with disability as well: communication technologies have the potential to empower disabled people, increasing accessibility and independent living. Nevertheless, scholars are highlighting how technology alone is not enough for a proper organizational inclusion (Alper, 2017).

As Ellis and Kent argue (2011), new technology can broaden accessibility and inclusion for impaired people through their affordances, but those same affordances can also produce new forms of exclusion. Disability, in fact, is all too often reconstituted and reconfigured in and through new technologies, both at the narrative and at the operational level. In this regard, Ellcessor et al. (2017, p. 16) argue that: "we need to understand the ways that media and information technologies are intertwined with the standardization and regulation of the human body" and how those processes shape the meaning of ability and disability.

Following these premises, the approach here proposed is inspired by a socio-material perspective, and is addressed to both the evaluation of the assistive potential of communication technologies and to the consideration of the technological artifacts as sites where knowledge about disability is produced, represented and enacted.

In the framework of disability studies, a “social model” of disability has been recognized as alternative or complementary to the medical model (Oliver, 1996; Siebers, 2008). Unlike the medical approach, which seeks to explain, diagnose, treat, and ‘cure’ disability as an individual pathology, disability studies considers disability as a social construct, in this way de-naturalizing it (Williams & Mavin, 2012). In the perspective of a social model, disability is not a matter of individual deficit, but of social justice and inclusion of disabled people cannot be addressed only to the individuals but has to account for a transformation of the context and of the built environment (United Nations, 2007; Sicca, 2016).

A socio-material approach such as the one here proposed can help integrate the medical model and the social model. If disability is constructed through normative assumptions underpinning socially constructed categories of difference, these assumptions are not located only in ideas and discourses, but also built into material artifacts, technologies and organizational structures, which concern the medical sector as well. As noted by Mills and Sterne (2017, p. 365), “not only do media produce disability through their textual representations of disability, they produce disability through their very operations, their institutional existences, and their policy and juridical dimensions”.

In this sense, the socio-material model is an essentially *relational* model, since it states the need to attend to disability as the result of dynamics of power that shape particular relationships among people, institutions, culture, and material structures such as technologies, organizations and medical practices.

2.2 Networks and action-nets

The relational approach which characterizes the socio-material turn in social sciences has a correspondence in the focus on networks in organization studies. A network is seen as a system of interdependent units wherein the behavior and outcomes of an individual node – be it a person, an organization, an industry or even a nation-state – depend on the structural pattern of relationships between that node and other nodes (Casciaro, 2020). In organization studies the interest in networks is not limited to the description of complex ecosystems within which organizations operate. Rather, following the lesson of Latour (2005; 2011), networks are considered as constitutive of organizing itself, since organizing is the product of associations and relationships between human and nonhuman actants. Accordingly, organizational research should shift attention from the nature of actants to the relations among them.

Merging this order of considerations with a reprise of Weick’s work, Czarniawska (2004; 2010; 2014) has proposed to move from the notion of networks to that of *action-nets*. In her view, in fact, organizations have no closed and predefined borders, but are performed into being through organizing actions which cannot be defined “in principle” because they manifest only “in practice”. In this sense, the unit of organizational analysis should not be relations among actants, but relations among actions themselves.

The importance of action-nets for organization theory resides in the fact that they allow us to describe organizing not only in space but also in time (Czarniawska, 2004): the concept of action-nets allows us to focus on how heterogeneous actions can intertwine and produce something as an organization. In this perspective, neither organizations nor their constitutive elements exist before they are associated and become part of a network; it is only when a network is constituted that they acquire a sense and can be recognized as parts of an organization. While this consideration is shared with actor-network theory (see Czarniawska & Thor, 2005), Czarniawska's action-nets approach is addressed to the very emergence of networks, that is to the moment heterogeneous elements are associated together via organizing actions. In this sense, action-nets give great attention to the precariousness of associations and to the possibilities of change and transformation.

Merging this approach with recent trends in management research which focus on "multimodality" (Van Leeuwen, 2017; Giovannoni & Napier, 2022), as well as with social network research in management (Ujwary-Gil, 2017; Shapilov & Gawer, 2020), in this study we propose to extend the notion of action-nets to *multimodal action-nets*. With this, we refer both to the interdependence of multiple networks and to the multiple material and semiotic modes by which the networks' nodes present and interact with each other in "multimodal interdependence" (Casciaro, 2020). For example, networks between people and the ecosystems they interact with, the organizations they work for, and the technologies, transportation and trade networks that connect the communities they live in, with the messages, values and aesthetics they convey, can be considered as multimodal action-nets insofar as they are observed in their emerging, deploying and stabilizing.

2.3 Organizational inclusion

Recent debate about organizational inclusion has focused on diversity as a richness and an added value for organizations. Scholars have focused on inclusion to move beyond diversity management (van Eeck et al., 2021; Adamson et al., 2021), which dedicated primarily to increase the representation of members of disadvantaged groups. Inclusion, on the other hand, attends to the value that people with a variety of differences bring to the organization (Shore et al., 2011; 2018; Mor Barak, 2014; Ferdman, 2017; for a systematic review of diversity management literature see Yadav & Lenka, 2020). This scholarly attention goes along with new trends in corporate culture, becoming a kind of corporate fashion (Jonsen et al., 2019).

Recent studies see inclusion as deriving from individual or collective actions and behaviors (Dwertman et al., 2016), or from an organizational culture shared between members of an organization (Glisson, 2015), or else from a psychological climate of inclusion (Nishii & Rich, 2014). Shore et al. (2018) propose a model of inclusion based on the individual's balance of uniqueness and belongingness, conceived as the capacity of organizations to treat individuals as insiders without flattening their unique and diverse traits within predefined roles. In all these perspectives, inclusion is related to the feeling of being accepted, valued and recognized (Mor Barak, 2015).

Nevertheless, it has been noted how most of these approaches to diversity and inclusion are exclusively business-led, insofar as they value people's differences in terms of performance, productivity, or brand image. Organization studies scholars on the other hand highlight the fact that attention to inclusion clashes with requests of performativity and productivity, showing the limits of profit-driven forms of inclusion (Zanoni, 2010; 2011; Zanoni & Janssens, 2004; 2015; Jammaers, 2022). Inclusion narratives have also been criticized for being simplistic and naively "happy" (Dobusch et al., 2021), while paradoxical outcomes of inclusion and the collateral exclusions it produces have also been noted (Ferdman, 2017).

As argued by Dobusch et al. (2021), organizational inclusion research first and foremost approaches differences in terms of "individual uniqueness" (Shore et al., 2018), viewing the relationship between minority and majority employees as potentially beneficial for – and thus reconcilable with – organizational goal achievement. Structural changes of the organization that might make it more inclusive of different needs and preferences as well as more receptive to experiences of discrimination and exclusion are neglected in favour of what Janssens and Steyaert (2019) describe as an "individualist ontological stance". This implies that both the measurement of inclusion (and exclusion) in organizations and the design of connected "inclusion initiatives" revolve around individual organizational members and their perceptions, mental structures and biases, underestimating the role of embodiment, materiality and historical power relations in producing and reproducing exclusion and marginalization.

This consideration highlights how most of the approaches to organizational inclusion underestimate the network dimension, while privileging the individual one. In our perspective, inclusion always involves a network of human and non-human actors. This is particularly evident when dealing with disability, as inclusion entails at least the following elements: a) the adoption of technological tools to provide accessibility (Hamraie, 2017; Hamraie & Fritsch, 2019); b) the transformation of organizational assets in order to accommodate people with impairments (Van Laer et al., 2020); c) the revision of job offers, interviews and hiring processes (Gewurtz et al., 2016), as well as of assessment methods (Brown et al., 2020); d) the interdependence between public organizations and IT services (Alper, 2017); e) the presence of public funding for the costs related to accessibility, as well as the economic penalties related to non-compliance with disabled hiring quotas; f) the correspondence between nonhuman agencies of technologies and institutional policies and laws; g) the use of specific narratives, discursive practices and knowledge about ability and disability (Garland-Thomson, 2012).

3. Research method

Here we present the initial stages of empirical research, whose provisional findings support our theoretical proposal. Research has been conducted by comparing empirical material collected through interviews with journalistic reports. We have conducted five in-depth interviews with disabled people in Italy. Interviews were focused on personal experiences with the use of communication and assistive technologies in everyday practices and working activities. Three of the interviewees were visually impaired, while two used wheelchairs. The interview subjects were between 27 and 55 years old, and all are employed in public institutions in the roles of accountant, receptionist and teacher. Each interview lasted between 75 and 90 minutes. Besides interviews, we have analyzed three stories reported in journals and magazines: Chancey Fleet's (2019) report of her experience with navigation apps; Neta Alexander's (2020) report of her experience with IoMT (Internet of Medical Things) and biodata extracted by prosthetic devices; Deborah Righettoni's (2020) story of her work experience as a speech-impaired person in Italian firms.

As argued by disability studies scholars such as Sterne (2021) and Alper (2017), disabled people's autobiographies have the power to merge personal feelings with a review of assistive technology "in place" and from the point of view of the disabled person. Such stories tell a different truth than the official one promoted by organizations, firms, tech companies and public discourses (Napolitano, 2021a). In this framework, the inclusive power of technology is immediately problematized as it is confronted with lived experiences.

From these stories, then, it is possible to see assistive technology and communication aids as elements of a socio-material "assemblage" (Latour, 2005), in which certain discursive and non-discursive definitions of technology (which regard, for example, designers, public presentations, technical operations, institutions) encounter the point of view of the actual users, their agency and personal ways of embodying technology and its affordances.

This approach is different from the classic phenomenological one, since it doesn't take into account only the discursive aspects emerging from autobiographies, but also the "material practices" (Ellcessor et al., 2017) of the person's bodily actions, such as, for example, how users interact with buttons, dials, or other affordances; how they plug in earbuds or position themselves toward screens, listening devices or speaking devices; how their actions can be blocked or impeded insofar as they do not align perfectly with designers' ideas about the bodies that will engage with their creations, and so on.

In this perspective, autobiographies are a way to access and describe the action-nets (Czarniawska, 2014) of organizational inclusion, giving voice to the points of view of people with disability.

4. Findings

4.1 Interviews

Describing his daily routine, a blind person interviewed by us highlighted the many obstacles he faces on a daily basis. On the way from home to the workplace there are almost no tactile paths nor sound traffic lights; he uses a navigation app on his smartphone which gives him acoustic cues about the road, and after months of practice he has perfectly memorized the path; nevertheless, his navigation capacity is challenged anytime there are detours due to construction, when a traffic light is out of order, or by new signs or holes, in which he risks falling. Once at work, he cannot rely on the app anymore and he faces similar problems: although the place is equipped with ramps and curb cuts, no tactile maps or paths are present, and he can reach his own desk only using his cane, his hearing and his memory.

To do his job on the computer he employs a “screen reader”, that is a software that uses a synthetic voice to say out loud what is written on the screen; once the screen has been read, he can use his own voice to make prompts and commands, or to dictate texts. These tools allow him to use computers and smartphones by only listening and speaking. Accordingly, these are considered fundamental tools for social and organizational inclusion as blind people use them both at home, in public places and in the workplace. Nevertheless, he has experienced difficulties when requesting his employer to equip his computer with a screen reader, although this right is explicitly defined by Italian national law (law 4/2004, so called Stanca). As he declares:

I had to wait one year before having the software installed, and in the meantime, I had to bring my own computer to work [...] Also the screen reader installed on my own personal computer should have been provided by the national health system, but my request was delayed many times and I eventually decided to buy the software with my own money.

During the interview, he also described the atmosphere in the workplace and the relation with his colleagues and the management, highlighting the great sense of community and inclusion he experiences at work:

All the colleagues are friendly and willing to collaborate and help. I never feel no discrimination at all.

Nevertheless, this inclusive feeling clashes with the barriers he finds on his way every day, even before starting to work. Although workplaces are legally required to accommodate people with disability, the costs of modifications and relative equipment are often not sustainable for private organizations, especially SMEs, while fines for non-compliance are usually cheaper than the costs of the accommodation itself. As a result, many companies prefer being fined rather than providing accessibility for all. But a lack of accommodation of the workplace is related to a lack of accessibility that starts before arriving at the workplace, and involves streets,

public transit, apps, renovations, public policy and culture – and accordingly all the organizations responsible for the construction, development and management each of those aspects.

Therefore, organizational inclusion is not limited to workplaces, but concerns the complex network of public and private organizations involved in getting to the workplace, and in the design and adoption of the tools employed to work.

Another of the interviewee highlighted that a limit with navigation apps is that they rely on maps services (provided by private tech companies) which are not optimized for disabled people's needs. For example, they only map outdoor spaces, but not public indoor spaces, such as train stations, libraries and markets, where blind people still require navigation assistance.

A similar problem has been reported by another of the interviewees, a wheelchair user, who underlined the fact that map services have only recently implemented functions for mapping the accessibility of places, informing users about potential barriers on the journey to reach their destinations. As accessibility information is provided directly by users, according to the logics of participatory culture so common on digital platforms (Jenkins, 2006), the limit of that service is the lack of comprehensive coverage. Moreover, the process of obstacle submission by users does not offer clear information about verification criteria and turnaround time for the report, while only one of the map services available on smartphones allows the users to upload a photo of the obstacle, in this way letting users assess accessibility according to their individual needs. As we increase our reliance on online maps, private tech companies who provide map services are not only becoming gatekeepers to the public space, but are also deciding what can be considered a barrier and what not.

In describing a recent visit to a museum, a visually impaired person interviewed by us highlighted how the use of audio guides is not enough for a proper inclusion of disabled people in a museum. Two aspects were in fact underlined. The first one is that visual impairment is not only a matter of the medium through which accessing information, but also of the kind of information itself. People who were blind from birth, for example, can make no sense of descriptions that refer to colors or figures, while they would benefit from customized descriptions for their specific disability. The second aspect is that the museum in question allowed blind people to visit at certain times only. This measure may be due to the costs of the extra personnel necessary to accompany blind people in the first part of their visit and to equip them with audio guides. This shows how inclusion in organizations is not only a matter of accessibility tools and technologies, as those very technologies have extra costs related to their design, adoption, functioning and maintenance.

Moreover, as another interviewee has highlighted: “there's always a need for personalization.” When talking about assistive technology, a standard approach doesn't work, since the same technology may not be effective in different working contexts or may not fit the socio-cultural and economic situation of the person. For many, certain technologies may be beyond their means to acquire, or they may not have access to the necessary support from others to learn to use them (Alper, 2017).

4.2 Journalistic reports

In her auto-ethnographic report, Chancey Fleet (2019) describes her experience with communication aids for blind people, such as sound navigation apps for smartphones. Those apps use GPS to provide acoustic feedbacks to the user moving in the space, sending signals as the desired destination is being approached, calling out the names of approaching intersections and landmarks or giving voice indications to reach “accessibility” points such as ramps or traffic lights. Fleet notes how technical and design limits of those communication aids condition blind people’s movement in space, thereby affecting possibilities of inclusion. For example, if the map is not provided with accurate data, acoustic feedback will lead to confusion.

This consideration shows that inclusion is not only a matter of specific policies that organizations can adopt to improve accessibility, but is also a matter of the design of communication technologies employed within and outside the workplace. And, since technologies are designed by people who themselves work in organizations, a more inclusive design entails adopting inclusive policies at the level of tech companies’ organization of work: first of all, they should incorporate more disabled people into their design teams.

Fleet’s description also reveals another issue. In order to work properly, navigation apps have to rely on the map, but that’s only possible when the material space where people move is entirely datafied (Van Dijck, 2014), that is, when tech companies have enough data about the public spaces. This is the predatory dynamic Evgeny Morozov (2018) has highlighted about the logic of smart cities: private companies offer public institutions the design and management of infrastructures which fit better datafication, but in return, through the control of those very data, they take control over public goods and can influence policies. This suggests that leaving inclusion in the hands of private companies (and their technologies) has a series of downsides: “As I consider the avoidable infrastructural frictions imposed on Blind people by sighted decision-makers — illegible signage and wayfinding, mumbled transit announcements, and inaccessible digital amenities, to name a few — I reflect that our collective ability to improve nonvisual access to the public spaces of the future is blunted because so many of us are absent from public spaces today.” (Fleet, 2019).

Neta Alexander (2021) notes how medical tools are increasingly provided with communication systems such as IoMT (Internet of Medical Things), which allow them to transmit sensitive data to clouds and servers where they can be algorithmically analyzed. In this scenario, medical data are more and more often in the hands of private companies which produce prostheses, pacemakers, insulin pumps, etc, rather than in those of public health systems. As far as those data improve monitoring of the patients, they also produce the side-effect of relying on algorithmic predictions of the patient’s health, so reducing the frequency of face-to-face visits, with the risk of decontextualizing the patient’s conditions, as Alexander herself experienced first-hand.

Such data can also be translated into automatic assessments of a person’s status which can bias or prejudice processes of hiring (Brown et al., 2020). And disabled

people are the most interested by this risk, both because they rely more than others on medical apps, subjecting them to more monitoring, and because they often don't comply with the standards used to assess people's suitability to a job. This makes clear how the setting of standards is a non-inclusive practice in the first place, since it is made from an ableist position. Medical technologies equipped with communication systems, then, are not mere monitoring systems, but contribute to the very definition of those standards, becoming "normative" tools.

In this sense, inclusion becomes less a matter of social justice and more a matter of access to private services and technical agencies. This approach shows how communication aids are not just assistive technologies, but sites where knowledge about disability is produced, represented and enacted (Napolitano et al., 2022). In this sense, they can't be simply inclusive, as inclusion is not achievable through a simple technological fix. Indeed, technology itself is never just a matter of devices, but involves knowledge, narratives and organizing.

Deborah Righettoni (2021) tells how inclusivity in the workplace in Italy is affected by a paternalistic attitude which reflects an ableism inherent in legislation: in order to comply with inclusivity standards her company hired her, a speech-impaired person, to work in the call center. Paradoxically, the company has entrusted her with a job objectively unsuitable for her disability: talking on the phone. This experience reflects a socio-material problem: for the company it is less expensive to hire a "useless" worker and comply with the law than to adopt a more inclusive communication system in its customer service.

It has been noted how most approaches to diversity and inclusion are exclusively business-led or value people's differences in terms of performance, productivity, or brand image. As argued by Dobusch et al. (2021), organizational inclusion research first and foremost approaches differences in terms of "individual uniqueness" (Shore et al., 2018), viewing the relationship between minority and majority employees as potentially beneficial for – and thus reconcilable with – organizational goal achievement. Nevertheless, Righettoni's story highlights how this is often a very abstract reasoning: Structural changes of the organization that might make it more inclusive of different needs and preferences as well as more receptive to experiences of discrimination and exclusion are neglected.

5. Concluding discussion: action-nets, inclusion and resilience

Communication technologies, as seen from the above stories, are part of a socio-material assemblage in which meanings of disability and inclusion acquire their sense. Technologies, in fact, embed images of the disabled user; in organizational life, those images interact with users' personal experiences, material structures, public policies and corporate strategies, as well as with dislocated clouds of data transmission, storage and processing. Therefore, organizational inclusion should not be focused only on individuals (Shore et al, 2018), but should take into account the networks of public and private actors involved at the discursive and material level. They include personal stories of disabled people, material practices of embodiment

and nonhuman agencies of technical media, as well as private companies' HR management and data processing and their relation to public institutions' administrative needs.

In this perspective, inclusion is not only a matter of specific policies, but it should be seen as inscribed in *action-nets* (Czarniawska, 2014) – where actors do not exist as long as connections are not created – which branch out at multiple levels: individuals, workplaces, public institutions and services, design of technologies (and composition of designers' teams), tech corporations, data centers, narratives and knowledge. We define these as *multimodal action-nets*, as they deal with interdependencies across multiple classes of nodes and multiple material and semiotic modes of presentation (Van Leeuwen, 2017; Giovannoni & Napier, 2022).

One of the reasons mainstream views of inclusion are misleading may be found in what Janssens and Steyaert (2019) describe as an “individualist ontological stance”, according to which both the measurement of inclusion (and exclusion) in organizations and the design of connected “inclusion initiatives” revolve around individual organizational members and their perceptions, mental structures and biases. Consequently, the individual becomes the locus for organizational change, neglecting the role of socio-material factors, assemblages and action-nets. Such a conceptualization of organizational inclusion is not only limited by its condition of (economic) exploitability, but more generally by its individualistic assumption, which abstracts the individual from the social forces and external connections which produce marginalization.

We can find this kind of approach anytime technology is considered as an inclusive and empowering tool in itself. The inclusive potential of technologies is turned upside down when the network of social forces in which it operates is examined: for example, when people or organizations cannot afford to buy devices or modify the workplace to allow accessibility, or when technologies themselves are designed with biased images of the disabled user – a condition which happens above all when no disabled person is included in the designers' teams. This reverberates in other classes of nodes, for example when hiring policies and HR management of private and public organizations are affected by state laws or by different ideas about valuing disability. Nonhuman agencies of technology open to other levels of interdependencies, for example when some of the functions which are supposed to be empowering for people with disability are not considered as legitimate by national laws or internal organizational policies, or when they function at the cost of a loss of privacy. Eventually, this can lead to trade-offs between the pursuit of independent living for people with disability (a leading value of inclusion, as stated by the UN Convention, 2007) and a radical interdependence between organizations which are supposed to create the conditions for that independence. The use of assistive and empowering technology, in fact, can come at the cost of giving excessive power to big tech corporations, as seen in the smart city model (Morozov, 2018), or when public services rely on geolocalization and map services provided by private tech companies. During the pandemics, public schools and universities relied on virtual conference services provided by private tech giants to provide lessons (Napolitano, 2021b), and

many of them still depend on such services to provide accessibility to classes for people with disabilities.

In light of these considerations, any theory of organizational inclusion should not start from the assumption of disability as a resource for organizations, but should rather question how organizations produce disability as a social construct in the first place (Williams & Mavin, 2012). Disability, in fact, is not a stable and defined ontological condition, but is itself constructed and reproduced in action-nets, that is, through norms, assets, hiring policies, discourses, objects, architectures, technologies, in multiple and interconnected organizations.

The multimodal action-nets perspective here proposed allows us to overcome both limits in the traditional network approach and limits in the theorization of inclusion. Network approaches take into account the relationship between people and the ecosystem they interact with, the organizations they work for, and the transport and trade networks, but they don't consider the connections between actions. Similarly, theories of organizational inclusion give too much importance to individuals and accessibility devices, but underestimate the actions through which individuals use and make sense of those devices, as well as the way public and private companies communicate with each other and with people.

The shocks of recent years, including the pandemic, have led to a change in these dynamics, highlighting the need to update classic categories of organization theory in the direction of complexity and ecology (Shipilov & Gawer, 2020). Categories of macro and micro don't seem to be adequate anymore: From a macro perspective, the "collaboration" factor seems to be the solution used by companies to face a common problem, rethinking their degree of interdependence with the other players in their network. However, that same factor doesn't seem to translate directly into a micro perspective, where the terms and barriers that prevented the organizational inclusion of people with disabilities do not cease to favor the emergence of new forms of collaboration between individuals.

Similarly, models of connection between organizations, ideologically ascribable to those of Market or Hierarchy, are not satisfactory when dealing with issues such as that of inclusion of people with disabilities. A market perspective, in fact, would reduce the sense of inclusion to the possibility of valorizing disability, for example by gaining a new market in the disabled community, or with regard to the goals of turnover. On the other hand, a hierarchical perspective would see accessibility as a problem to be solved, something that brings costs, remodulation of spaces and rethinking of production times. None of these approaches can account for the interdependencies among the multiple factors involved in the actions and practices of inclusion, nor for the socio-material assemblages in which the very social categories of ability/disability, inclusion/exclusion acquire their sense.

In this perspective, this study may contribute to the contemporary debate in organization studies by relying on the connection between the constructs of *inclusion* and *resilience* in the framework of multimodal action-nets. While action-nets found a rigorous theorization in the work of constructionist scholar Barbara Czarniawska, it is her mentor Karl Weick who provides us with a useful definition of resilience: "Resilience is a combination of keeping errors small, of improvising work arounds

that keep the system functioning, and of absorbing change while persisting.” (Weick & Sutcliffe, 2015, p. 97). In Weick and Sutcliffe’s perspective, resilience is something different from recovery, as “in moments of resilience, conditions *vary* yet the effect remains the same.” (ivi, p. 98), while in moments of recovery the main aim is to restore the initial conditions. This consideration is particularly interesting if related to the understanding of inclusion here proposed. Inclusion seen in the framework of multimodal action-nets, in fact, is a process of reconfiguration of the organizational and social context addressed to accommodate the instances coming from the margins – marginalized people, such as those with disability, as well as marginalized practices and knowledge (Sicca, 2016). As such, it is a dynamic process that not only attempts to resolve transformations, shocks and unexpected events, but may even contribute to their production. As highlighted by scholars such as Nkomo (2015) and Ferdman (2017), inclusion is not possible without a change in organizational norms and structures, and such change does not come easily. If, following Weick and Sutcliffe (2015), resilience is not intended as a restoration of a condition precedent to the shock, but as a transformation that preserves organizational effectiveness under varying conditions, then resilience appears as a crucial aspect for pursuing inclusion.

The approach here suggested is grounded on well-established constructionist thinking, according to which organizations are not be considered as stable objects with closed and well-defined borders, but as performed into being through organizing actions (Czarniawska, 2003, 2015), therefore open to change. In this perspective, resilience is not a temporary remedy to the unexpected, but a necessary condition of organizing. This approach seems particularly meaningful when addressing the issue of organizational inclusion of disabled people, as it allows to escape normative or top-down logics, which are both ineffective and theoretically weak (Jammaers, 2022) as they overlook the complex networks made of personal stories of disabled people in their interaction with communication technologies and the material practices and nonhuman agencies through which disability is produced in organizing.

This study has clear limits determined by the small amount of empirical data it uses. Further stages of research will aim to confirm the theoretical lines here proposed by comparing them with more interviews and personal stories, thereby offering greater insight into the networks which involve people, organizations, technologies and in which inclusion can be deployed. Indeed, inclusion is never merely technological, but technology is a “strategic research site” (Alper, 2017, p. 11) for studying the organization of social practice and the production of inclusion/exclusion dynamics.

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