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NEW WORKING SPACES IN MANAGEMENT SCIENCES: A SYSTEMATIC REVIEW AND KNOWLEDGE TRANSFER FOR SOCIOECONOMIC GEOGRAPHY

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ABSTRACT: New Working Spaces (NWS) constitute an innovative organisational form that deviates from traditional organisational structures. Characterised by open membership, these spaces integrate craftsmen, artists, and creators operating as freelancers or micro-entrepreneurs. A distinct category of NWS encompasses makerspaces, hackerspaces, and fab labs, which – in contrast to conventional coworking offices – emphasise production, construction, and craft activities, frequently employing advanced technologies. These spaces not only facilitate access to technical infrastructure but also cultivate an environment

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conducive to development through knowledge exchange and networking. Research on NWS has developed within two main disciplines: socioeconomic geography and management sciences. While socioeconomic geography focuses on spatial distribution patterns, impacts on local economy, and regional development dynamics, management sciences have made significant contributions to understanding the organisational aspects of new working spaces, community-building within them, and the mechanisms of innovation processes occurring there. Given the growing number of such spaces in Poland and the simultaneous lack of research combining management and geographical perspectives, there appears to be a need to deepen knowledge transfer between these disciplines. This article presents a systematic literature review of makerspaces, hackerspaces, and fab labs in social sciences, with particular emphasis on research useful for scholars within socioeconomic geography. The article presents scientific achievements from various disciplines, covering the main research streams concerning collaborative spaces, key concepts, and empirical findings. One of the objectives is to facilitate access for socioeconomic geography researchers to findings on NWS from management sciences and related fields. Two bibliometric analysis tools were used to prepare the analysis, namely Bibliometrix and VOSviewer. This overview can serve as a starting point for further research on the role of new working spaces in local and regional development.

KEYWORDS: new working spaces; collaborative spaces; fabrication laboratory; makerspace; hackerspace.

NOWE PRZESTRZENIE PRACY W NAUKACH Z ZAKRESU ZARZĄDZANIA – PRZEGLĄD LITERATURY DLA GEOGRAFII SPOŁECZNO-EKONOMICZNEJ

ZARYS TREŚCI: Nowe przestrzenie pracy [ang. *new working spaces* (NWS)] stanowią innowacyjną formę organizowania działalności, odbiegającą od tradycyjnego rozumienia organizacji. Charakteryzują się otwartym członkostwem. Łączą rzemieślników, artystów i twórców działających jako freelancerzy lub prowadzących mikroprzedsiębiorstwa. Szczególną kategorią NWS są przestrzenie współpracy takie jak *makerspace*, *hackerspace* i *fab lab*, które – w przeciwieństwie do podobnych doń biur coworkingowych – koncentrują się na działalności produkcyjnej, konstrukcyjnej i rzemieślniczej. Często wykorzystują zaawansowane technologie. Przestrzenie te nie tylko zapewniają dostęp do infrastruktury technicznej, ale również tworzą środowisko wspierające rozwój poprzez wymianę wiedzy i *networking*. Badania nad NWS rozwijają się w ramach dwóch głównych dyscyplin: geografii społeczno-ekonomicznej oraz nauk o zarządzaniu. O ile geografia społeczno-ekonomiczna koncentruje się na wzorcach rozmieszczenia przestrzennego, wpływie na lokalną gospodarkę i dynamice rozwoju regionalnego, o tyle nauki o zarządzaniu wniosły istotny wkład w zrozumienie aspektów organizacyjnych nowych przestrzeni pracy, budowania weń społeczności i mechanizmów zachodzących tam procesów innowacyjnych. Wobec rosnącej liczby tego typu przestrzeni w Polsce i jednoczesnego niedoboru badań łączących perspektywę zarządzania z geograficzną, można założyć istnienie potrzeby pogłębienia transferu wiedzy między tymi dyscyplinami. Prezentowany artykuł to systematyczny przegląd literatury na temat makerspace'ów, hackerspace'ów i fab lab'ów w naukach społecznych, ze

szczególnym uwzględnieniem badań użytecznych dla badaczy zagadnień z zakresu geografii społeczno-ekonomicznej. Artykuł prezentuje dorobek naukowy z różnych dyscyplin. Obejmuje główne nurty badawcze dotyczące przestrzeni współpracy, kluczowe koncepcje i ustalenia empiryczne. Jednym z jego celów jest ułatwienie badaczom geografii społeczno-ekonomicznej dostępu do ustaleń dotyczących NWS z zakresu nauk o zarządzaniu i nauk pokrewnych. Do przygotowania przeglądu wykorzystano dwa narzędzia służące analizom bibliometrycznym – Bibliometrix oraz VOSviewer. Artykuł może służyć jako punkt wyjścia do dalszych badań nad NWS, łączących perspektywę organizacyjną z geograficzną.

SŁOWA KLUCZOWE: nowe przestrzenie współpracy, organizacje kooperacyjne, fablab, makerspace, hackerspace.

2.1. Defining New Working Spaces

Exploring terminological diversity

New Working Spaces (NWS) encompass a variety of workspaces dedicated to manufacturing activities. These spaces (recognised within academic discourse also as collaborative spaces or organisations) are also known by various names such as makerspaces, hackerspaces, fab labs, tech shops, men's sheds, and others (Van Holm 2014). They can be defined as localised spaces that provide open access to resources, characterised by a culture of openness and collaboration in terms of sharing knowledge, skills, and tools. These shared resources encompass a wide range, from physical assets such as office equipment as well as various machinery and prototyping tools to more intangible resources such as knowledge, opportunities for professional networking, and access to training and mentorship.

Makerspaces, hackerspaces, and fab labs have emerged as distinct organisational entities, although there is considerable interchangeability in their usage within research literature. For instance, makerspaces are sometimes referred to as fab labs, indicating a degree of overlap in their functions. The academic community remains divided on whether to treat these terms as separate phenomena or as synonyms (Van Holm 2014). Therefore, it becomes essential to establish clarity on this matter. This will help minimise confusion in future independent literature and bring much-needed clarity to the linguistic ambiguities.

Recent research in the field (Micek et al., 2024) indicates that the NWS landscape is quite diverse, encompassing various types of spaces ranging from coworking offices and creative hubs to makerspaces and hackerspaces. Each type serves different needs and attracts distinct user communities. For the purpose of this review, I focus primarily on three types of manufacturing-oriented NWS: fab labs, hackerspaces, and makerspaces. These types were selected, because they share a common emphasis on production and activity-making while maintaining distinct organisational characteristics that merit separate examination.

This narrower focus allows for a more detailed analysis of spaces that facilitate not just collaborative work but also tangible production and innovation. It also provides clarity in a field where terminological ambiguity remains prevalent. The following sections examine each of these three types in detail, highlighting their unique features and organisational principles, before their common foundations are discussed.

Fab Labs

A Fab Lab, an abbreviation for Fabrication Laboratory, serves as a dedicated space where individuals with a passion for making can convene, engage in exchanging ideas, and collaborate with the shared objective of designing and fabricating customised objects. This concept was initially formulated in 2005 by Neil Gershenfeld from the Center for Bits and Atoms (CBA) at the Massachusetts Institute of Technology (MIT). Originally conceived as an experimental approach, fab labs aimed to explore the applicability of a non-conventional manufacturing models in regions facing challenges in terms of tools availability, technology accessibility, and resource scarcity.

What sets fab labs apart from other cooperative organisations is their adherence to "The Fab Charter", i.e. a governing document that outlines specific hardware and software requirements (Walter-Herrmann 2013). The founders of fab labs are obligated to provide adequate technological infrastructure as specified by the Charter. This facilitates collaboration among fab labs, enabling knowledge-sharing, idea exchange, and project implementation across different locations. While fab labs can sometimes be situated within other institutions such as universities, companies, or foundations, they typically strive to maintain an ethos of open and unrestricted access to their facilities. It is important to note, however, that accessing and utilising fab labs may necessitate the acquisition of access privileges.

Hackerspaces

The concept of hackerspaces originated in the late 1980s with the founding of organisations such as the Chaos Computer Club and the enduring C-base in Berlin. Prior to the common association of the term "hacker" with illicit computer activities, the term "hack" had referred to the exploration and understanding of "how things functioned". As computer access became more widespread, hackerspaces gained popularity among hobbyists who sought collaborative project work, mutual learning, and the formation of communities centred around shared interests (Levy 2001).

As the idea of hackerspaces grew, the term "hacker" expanded beyond programming to encompass electronic circuit prototyping. According to Kostakis,

Niaros, and Giotitsas (2014, p. 3), hackerspaces can be defined as "physical, community-led places where individuals, immersed in a hacker ethic, are to be met with on a regular basis engaging with meaningful, creative projects". Unlike fab labs and makerspaces, each hackerspace has its own unique, unregulated organisational structure and areas of focus. For instance, some hackerspaces primarily address feminist issues related to gender participation in programming activities, while others may emphasise robotic competence training. Hackerspaces are also characterised by their emphasis on providing a learning environment for hackers rather than solely granting access to technology. Additionally, they are known for their political nature and distinctive culture based on anarchy and broad autonomy (Maxigas 2012).

Makerspaces

Makerspaces, initially established as do-it-yourself (DIY) workshops for children within American schools, daycare centres, and libraries, have evolved in recent years to encompass a broader scope and diverse target groups. The term "makerspace" is now commonly used by practitioners to denote any coworking environment that fosters knowledge-sharing, collaboration, exploration, and creative utilisation of technology. Consequently, makerspaces lack a specific set of tools or predefined activities within this context. What distinguishes them is their emphasis on public access and the provision of basic infrastructure necessary for DIY endeavours. It should be noted that the majority of creations produced within makerspaces do not enter the commercial market, and many projects are ultimately deemed unsuccessful (Anderson 2012).

The fundamental principles of new working spaces

Despite the distinct nuances and focal points associated with each individual type of space, makerspaces, hackerspaces, and fab labs can be comprehensively classified as new working spaces by virtue of their shared fundamental principles. Collaboration serves as a cornerstone in these environments, enabling individuals to join forces, exchange ideas, and collectively engage in projects (Bosworth et al. 2023; Smit et al. 2023). A strong emphasis is placed on knowledge-sharing and skill development as well as fostering an environment where members actively impart expertise, mentor others, and engage in peer learning (Zhang et al. 2024; Mariotti, Pacchi 2021). Additionally, a common attribute among these spaces is their promotion of a DIY culture, empowering individuals to take an active role in the creation, design, and prototyping of their projects.

Lastly, makerspaces, hackerspaces, and fab labs can be regarded as new working spaces due to their shared characteristics and cultural roots. These spaces serve as catalysts for innovation and creativity, fostering experimentation, exploration,

and the cultivation of groundbreaking ideas. The convergence of overarching principles unifies these distinct yet interconnected spaces under the category of collaborative spaces. According to van Holm (2014), the shared attributes include also the democratisation of access to technology by providing resources that are accessible to anyone interested. This accessibility can be achieved through universal access or by offering specific services, such as the use of designated machines at certain times. NWS are also equipped with a diverse range of tools and equipment, encompassing advanced electronic devices (e.g. 3D printers, laser plotters) as well as traditional craft tools (e.g. lathes, looms). This versatility enables the creation of various types of outputs, from garments to furniture and computer software. Collaborative spaces represent an emerging phenomenon in urban and regional development, serving as nodes of social and economic activity. They function as designated workspaces that not only provide opportunities for collaboration but also enable the formation of spatial and social relationships in the work environment (Akhavan et al. 2023; Danko et al. 2024). These spaces act as workplaces for individuals from various professions, including artists, engineers, programmers, craftsmen, educators, and community members. While some spaces may have a more basic infrastructure, their multiplicity still allows for a wide range of activities and production possibilities. The presence of this diverse professional community fosters local development by creating meeting grounds for individuals with distinct expertise. Research shows that in metropolitan areas, NWS tend to agglomerate in a limited number of local clusters (Zhou, 2019; Huang et al. 2020; Zhai, 2021; Bednář et al. 2021). Such spaces serve as catalysts for urban and regional growth by cultivating a sense of community, facilitating collaborative endeavours, and enabling knowledge exchange between different sectors of local economy (Méndez-Ortega et al. 2022; Tomaz, Henriques 2023). This multifaceted nature of NWS makes them particularly significant for studying the spatial patterns of social and economic activity in urban environments.

The cultural roots of new working spaces

New working spaces have diverse cultural roots that determine their character, structure, and functions. Current research indicates two main cultural currents that have shaped the development of these spaces: the "Do It Yourself" (DIY) culture and the collaborative "Do It Together" (DIT) culture.

Micek and colleagues (2024) propose a taxonomy of NWS which distinguishes between spaces derived from the DIY culture and those derived from the collaborative culture (see Figure 1). This classification highlights the diversity of NWS and their various purposes, structures, and characteristics.

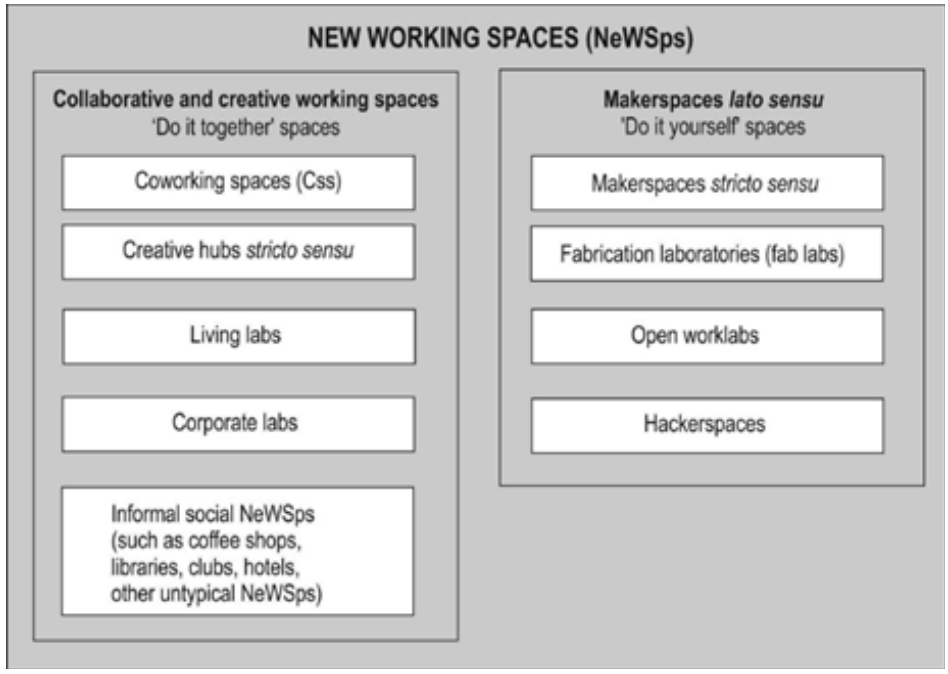

Figure 1. The taxonomy of new working spaces (NeWSps)
Source: Micek et al. 2024.

As illustrated in the figure above, NWS can be divided into two main categories: spaces based on collaboration and creativity ("Do it together") and makerspaces in the broad sense ("Do it yourself"). The former focus on community-building, knowledge-sharing, and co-creation, whilst the latter place greater emphasis on individual projects, self-sufficiency, and creative independence.

The DIY movement originated from committed hobbyists who engage in independent work using raw materials or by repurposing existing objects. While embracing the individualist philosophy, the DIY culture encourages the exchange of ideas, concepts, and creative processes within a community (Chon 2018). Initially associated with home repairs and renovations, the DIY movement rejected the notion of relying on paid services, reflecting a countercultural and alter-globalist stance (Gauntlett 2011). This movement evolved over time, giving rise to zines and craftivism, adding political and creative dimensions to its manifestations (McKay 1998; Hackley 2013).

The maker movement, influenced by the DIY culture, incorporates countercultural elements while embracing the cooperative values and community-building characteristic of the DIT approach. Schmidt and Brinks (2017) emphasise that it is precisely this intersection of individual tinkering with collective creation

that constitutes the unique value of NWS as catalysts for innovation and local development. Recent research indicates that these spaces increasingly co-locate with creative industries (Akhavan et al. 2018; Mariotti, Di Vita, Akhavan 2021). Motivations such as financial gain, product unavailability, personalisation, skills improvement, and a sense of belonging drive individuals associated with collaborative organisations (Wolf, McQuitty 2011). These principles and motivations shape the perception and organisation of work within the maker movement.

Additionally, many fab labs, makerspaces, and hackerspaces identify themselves as part of the global coworking community, emphasising ideological adherence to its values grounded in sociopolitical foundations of collaboration, openness, community, accessibility, and sustainability (Colleoni, Arvidsson 2015). Coworking is often regarded as a physical manifestation of the open-source movement, peer-to-peer exchange, and the sharing economy while also exhibiting connections with urban art collectives (Lange 2011; Botsman, Rogers 2011; DeGuzman, Tang 2011; Moriset 2014). The post-pandemic increase in working from home has spatial consequences, as workers reconsider their commuting patterns and thus their residential and working locations. This trend is supported by the emergence of new waves of coworking spaces opening in peripheral locations (Brouwer, Mariotti 2023; Leducq, Demazière 2023).

As Ratto and Boler (2014) note, the collaborative culture (DIT) is based on the assumption that sharing knowledge, resources, and space leads to innovation and creativity that exceeds the capabilities of the individual. This dichotomy does not, however, indicate a sharp division – many NWS combine elements of both cultures. As demonstrated in recent studies, the collaborative culture extends beyond urban cantres to suburban (Ananian et al. 2024; Mariotti et al. 2021) and rural areas (Tomaz et al. 2022), reflecting the post-pandemic shifts in work patterns. For example, fab labs, despite originating from the DIY tradition, often create communities of practice characteristic of the DIT approach. Conversely, coworking spaces, whilst fundamentally collaborative, can support individual projects and creative autonomy.

By embracing the cultural roots of the DIY culture, craftivism, and coworking, NWS embody the principles of collaboration, open access, community, and collective creation. Recent comparative research reveals that the co-agglomeration of NWS with creative and knowledge-intensive sectors is not automatic but becomes contextually shaped by, among other factors, the urban spatial structure (Méndez-Ortega et al. 2022; Méndez-Ortega et al. 2024). These shared cultural influences further support the notion of considering makerspaces, hackerspaces, and fab labs as interconnected entities falling under the broader category of new working spaces.

The preceding background on the categories of NWS and the context of their cultural emergence can provide a framework for geography researchers who are engaged in analysing the functionality of these spaces within a spatial context. The subsequent section presents a systematic review of the existing literature on management. This review includes a description of organisational dimensions, the exploration of which has the potential to affect research in the field of socioeconomic geography in an enriching way.

2.2. An extensive review of the literature on new working spaces

Methodological insights – conducting a systematic literature review

To critically analyse the scientific discourse on NWS, a literature review was conducted using resources available in the Web of Science database. The Web of Science was selected due to its comprehensive coverage of high-quality and peer-reviewed academic journals, rigorous indexing criteria, and established position as a premier bibliometric database. This choice ensures that the analysis focuses on scholarly contributions that have undergone thorough peer review, enhancing the reliability of the findings. The review focused on cooperative organisations that align with the identified types: hackerspaces, makerspaces, and fab labs. Consequently, the analysis was limited to articles that explicitly employed these terms to describe either the subject or the object of their research. The search was restricted to English-language publications to ensure consistency in terminology interpretation and analysis.

Table 1. Syntax description and the source data selection process

Stage	Phrases, sets or categories	Operator	Number
Search Query Syntax	"makerspace*", "hackerspace*", "fab lab*", "fablab*"	OR	2,010
The designation of a set of social sciences	management, business	Refine	84
Reduction	proceedings paper	Exclude	71

Source: Author's own work.

While NWS are studied across multiple disciplines, the focus on management and business categories was deliberate and strategic. This specific scope facilitates the transfer of knowledge from management sciences to socioeconomic geography, which is one of the key objectives of this review. Management sciences offer valuable insights into organisational aspects, community-building,

and innovation processes within NWS that can significantly enrich geographical perspectives on these spaces. This targeted approach enables a deeper analysis of how organisational and managerial dimensions of NWS contribute to their spatial dynamics and local economic impacts.

The selection process followed a modified PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) methodology. Figure 2 presents a flow diagram illustrating the article selection process.

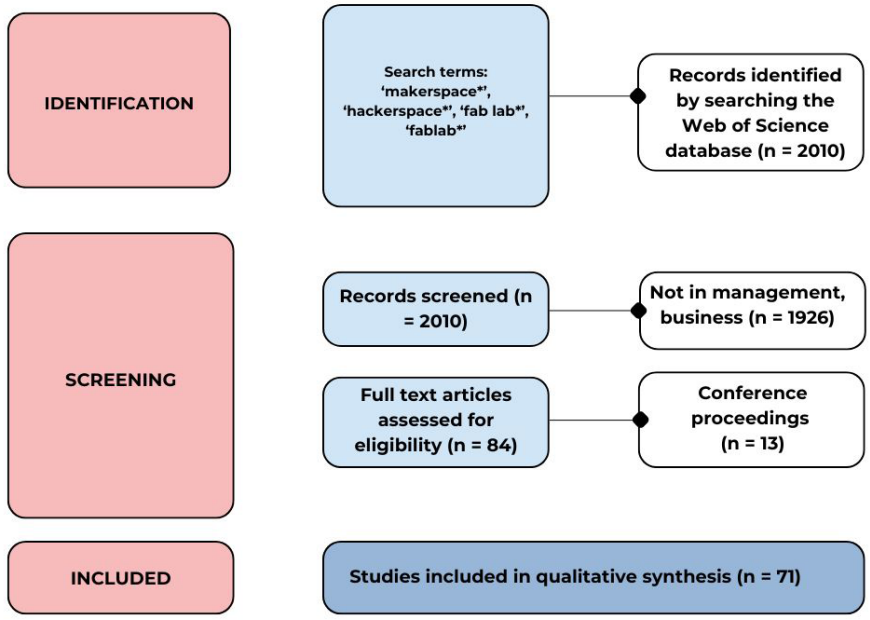

Figure 2. The flow diagram of source data selection process
Source: Own elaboration.

The initial search yielded 2,010 articles containing the specified terms. After limiting it to management and business categories, 84 articles remained. Conference proceedings papers were excluded to focus on full peer-reviewed articles, resulting in a final sample of 71 articles for analysis. This systematic approach ensures that the review captures the most relevant and high-quality research within the specified domain. For the analysis of the collected data, a total of 71 articles that met the specified criteria were utilised. The analysis was conducted using the VOSviewer software and the Bibliometrix software. These two complementary bibliometric tools were selected for their distinct analytical capabilities – VOSviewer excels in visualising bibliometric networks and identifying thematic clusters, while Bibliometrix provides a robust statistical analysis of publication patterns, citation metrics, and research trends. VOSviewer is a software tool specifically designed

for constructing and visualising bibliometric networks. It facilitates the graphical representation of clusters and their interrelationships by examining the mutual citations among authors who explore similar research topics and mapping the terms they employ (Van Eck, Waltman 2017). In contrast, Bibliometrix offers a more comprehensive array of tools for quantitative research in bibliometrics and scientometrics. While VOSviewer primarily focuses on data visualisation, Bibliometrix not only encompasses visualisation but also emphasises the validity and statistical integrity of the obtained results (Dervis 2019).

The content analysis process involved several steps. First, metadata from the 71 articles was extracted and processed through both software tools. VOSviewer was used to conduct co-word analysis based on term co-occurrence in titles, abstracts, and keywords, which revealed semantic relationships between concepts discussed in the literature. A minimum occurrence threshold was set to identify the most significant terms. These terms were then clustered based on their co-occurrence patterns, revealing four distinct thematic groups. Simultaneously, Bibliometrix was employed to analyse the development and maturity of research themes through its thematic map functionality, which plots themes according to their centrality and density.

It is important to acknowledge certain methodological limitations. The restriction to a single database (Web of Science) and to English-language publications may have excluded relevant studies indexed elsewhere or published in other languages. Additionally, the focus on management and business categories intentionally narrows the perspective, though aligns with the specific purpose of the review. Despite these limitations, the systematic approach which was employed provides a robust foundation for understanding the current state of research on NWS from the management perspective, with valuable implications for socioeconomic geography.

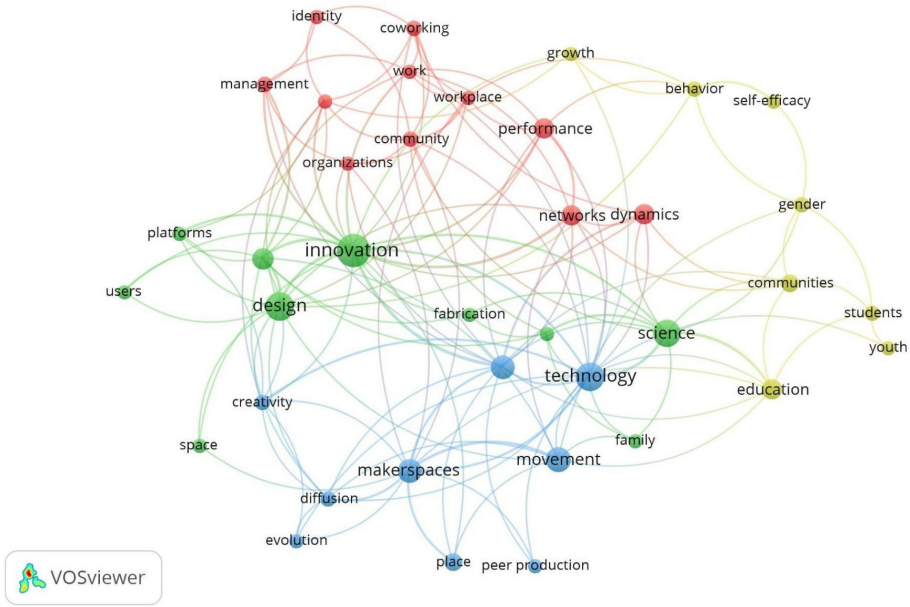

Figure 3. A map showcasing the interdependencies of topics within the discourse on new working spaces

Source: Output from VOSviewer.

Findings from the literature on new working spaces

During the analysis, VOSviewer identified four prominent thematic clusters within research on cooperative organisations, which were designated as follows:

- **Professional diversity** [yellow] – examines the demographic and social aspects of NWS users, including gender distribution, community-building processes, educational backgrounds, and behavioural patterns within these spaces.
- **Knowledge exchange and learning processes** [green] – focuse on how knowledge is shared and created in NWS, encompassing innovation processes, fabrication activities, learning dynamics, and design approaches.
- **Spatial dynamics and innovation ecosystems** [blue] – explore how NWS function within broader spatial and social contexts, including their relationship with technology development, contribution to social movements, evolutionary patterns, and role in fostering creative environments.
- **Organisational models and resource governance** [red] – encompass concepts related to the structural and operational aspects of NWS, including community organisation, network formation, coworking arrangements, productivity frameworks, operational dynamics, and governance mechanisms.

These thematic groups provide a structured framework for understanding the diverse research topics and areas of emphasis within the discourse on new working spaces.

The utilisation of computer software streamlined the literature research process without impeding critical thinking and personal engagement with the selected materials. The software tools employed in this study were grounded in linguistic analysis. However, it is important to acknowledge that certain words may possess different meanings within diverse scientific fields, potentially leading to erroneous associations between publications. Additionally, the presence of highly generalised terms that are commonly used across various domains may not offer substantial insights into the interrelation of publications (Janssens et al. 2008). Consequently, thoughtful consideration was given to the thematic threads explored in research on cooperative organisations and these threads were subsequently structured based on the clustering capabilities of the VOSviewer programme. Table 2 presents a condensed overview of the most significant findings from the systematic literature review rather than exhaustively listing all 71 analysed articles. This approach enhances readability while still capturing the breadth and depth of research on new working spaces. For each finding, key references are provided, allowing interested readers to explore specific topics in greater detail. This selective approach aligns with contemporary practices in systematic reviews that emphasise synthesis over enumeration (Grant, Booth, 2009; Paré et al. 2015).

Table 2. An overview of research on new working spaces

Thematic cluster	Findings	Authors
Professional diversity	Users within collaborative spaces embody an entrepreneurial mindset, seeking to establish their businesses on the foundation of social relationships. This entrepreneurial approach emphasises the significance of social capital in driving business success, as users harness the power of social relationships to access opportunities, exchange knowledge, and generate innovative ideas.	d'Andria, Gabarret 2017
	The entrepreneurial attitudes of individuals vary depending on the specific type of collaborative space they are engaged in, highlighting the influence of the workspace environment on entrepreneurial behaviours and mindsets.	Gertner, Mack 2017

Knowledge exchange and learning processes	The users of new working spaces engage in individual actions while operating within the context of a professional community. These spaces provide a supportive environment that allows individuals to pursue their own objectives, work on their projects, and advance their professional goals. Simultaneously, users benefit from the presence of a community that fosters collaboration, knowledge-sharing, and networking opportunities. This dynamics allows for the integration of individual autonomy and collective engagement, enhancing the overall effectiveness and productivity of collaborative spaces.	Castilho, Quandt 2017
	The connection among users within new working spaces is characterised by trust and a shared sense of community, which, in turn, positively influences the learning process. The presence of trust among users promotes open communication, knowledge-sharing, and collaboration, creating an environment conducive to learning and to personal development.	Boucken, Reuschl 2016
	Collaborative spaces serve as coordinators for accessing qualified professionals and knowledge, playing a crucial role in facilitating connections between individuals seeking expertise and knowledge providers. These spaces act as intermediaries, bridging the gap between individuals with specific needs or inquiries and the pool of qualified professionals within their network as well as technology.	Waters-Lynch, Potts 2017

Spatial dynamics and innovation ecosystems	Collaborative spaces foster connectivity and resilience in the face of external influences. They play a vital role in facilitating synergistic relationships and venture creation within DIY ecosystems, making them a fundamental component of their growth dynamics. By incorporating unique characteristics, collaborative spaces enable the expansion of DIY ecosystems beyond mere communities, contributing to their development and long-term sustainability.	Qiu et al. 2023
	Maker spaces, hacker spaces, and fab labs can be classified as physical interaction platforms (PIPs). PIPs are physical spaces that facilitate value creation through actor interactions and the establishment of ecosystem rules.	Mengual et al. 2023
	Makerspaces facilitate innovation and transform projects into entrepreneurial endeavours offering three types of resources. The social resources encompass interactions with a diverse, supportive community. The technology resources provide access to a range of software and hardware tools for artefact creation. The knowledge resources involve generating and sharing specialised knowledge within the collaborative makerspace environment.	Browder, Aldrich, Bradley 2019
	New working spaces and commercial business cultures intertwine and influence each other. This integration enables companies to offer collaborative spaces as an attractive employee benefit, promoting a more dynamic and collaborative work environment. This reflects the evolving nature of work and the recognition of the value of shared spaces in fostering productivity and innovation.	Pompa 2017

Organisational models and resource governance	Makers naturally employ various open-innovation approaches and seldom adopt a closed innovation strategy. Hobbyist makerspace innovators primarily utilise the free revealing strategy to draw in fellow collaborators for their projects. Conversely, professional makerspace users tend to favour selective revealing to maintain greater control over their intellectual property.	Zakoth, Mauroner, Emes 2023
	New working spaces are characterised by their bricolage approach. This thrives on synergy, creatively blending resources and openness, fostering the sharing of ideas and materials. While makerspaces excel in nurturing innovation in resource-constrained and ambiguous contexts where problems lack clear definitions, they often impede commercial growth. As a result, structured processes and, eventually, a shift away from makerspaces may become necessary for scaling innovation beyond collaborative environments.	Beltagui, Sesis, Stylos 2021
	Hackerspaces may exhibit social ostracism, hierarchical structures, and rigid rules, which can hinder inclusivity and collaboration. These aspects can create barriers to impede collaboration and limit the exchange of ideas.	Allen 2017
	Four distinct types of new working spaces can be identified, namely corporate spaces, open spaces, open corporate spaces, and consulting spaces, with each offering different environments and opportunities for collaboration and engagement.	Bouncken et al. 2018

Source: Own elaboration.

New Working Spaces (NWS) have emerged as a subject of considerable scholarly inquiry, encompassing various dimensions such as spatial distribution patterns, local economic impacts, and regional development dynamics. Notably, these spaces contribute to urban regeneration processes and the formation of innovative economic clusters. Further exploration of spatial relationships and location factors holds the potential to deepen our comprehension of how these spaces influence local economic development and social capital formation.

The emerging themes and trends

Within the realm of collaborative spaces, the academic discourse is relatively nascent, leading to a lack of precise definitions within the field, as elucidated earlier in this section. To address this gap, an analysis was undertaken to gauge the development degree of themes within the discourse on collaborative spaces, employing the Bibliometrix package. Additionally, these findings were juxtaposed with the cluster themes proposed by VOSViewer, thereby offering valuable insights into the development and evolution of research topics pertaining to cooperative organisations. This analytical approach serves as a means to unravel the landscape of scholarly investigation in the field and provides a foundation for further exploration and scholarly contributions.

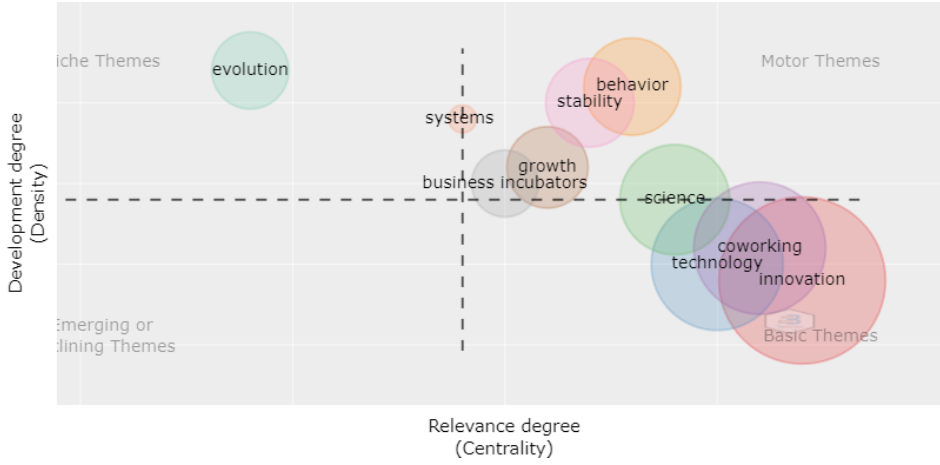

Figure 4. The matrix of the development and relevance of topics in the discourse about collaborative spaces

Source: Own elaboration.

The chart clearly shows that the research pertaining to growth, business incubation, stability, and behaviour emerges as the motor themes within the field of NWS. These themes consistently align with all the clusters identified through

the VOSviewer analysis. On the other hand, articles related to "evolution" are less common but strongly connected to other research areas. Through a qualitative assessment of these articles, it becomes evident that their focus lies in exploring the identity of cooperative organisations, their integration within various sociocultural factors, and their historical antecedents. Being positioned within a niche is unsurprising, considering the sociological essence of these investigations, which, in the context of fundamental economic and management research, frequently contribute as complementary and explanatory components. Conversely, research encompassing innovation, coworking, and technology resides in the realm of overarching and fundamental themes for the entire field. These concepts either serve as subjects of investigation or act as variables addressing diverse research inquiries.

2.3. Gaps and opportunities in research on new working spaces

The studies succinctly summarised in Table 2 reveal diverse avenues of inquiry, with notable emphasis on the modes of organising, non-competitiveness, value-oriented operations, and a collaborative orchestration of work within makerspaces, hackerspaces, and fab labs. Management research into user behaviour highlights distinctive attributes, including shared attitudes, values, and willingness to collaboratively allocate and regulate resource usage (e.g. Brafman, Beckstrom 2006). The theme of community and collective engagement also occupies a prominent place in the discourse. Community formation and collective engagement both represent another central theme in management literature. This research emphasises the global presence of "coworking community", "maker community", or "hacking community" (Spinuzzi 2012; Capdevila 2013; Gandini 2015; Waters-Lynch et al. 2015), whilst simultaneously highlighting the nurturing of local community bonds (Capdevila 2013; Moriset 2014; Merkel 2015). Management sciences show that NWS, often initiated as endeavours of modest scale, characterised by independence and a non-profit orientation, predominantly emerge through local activists or entrepreneurs. This local embeddedness often results in their integration within their geographical contexts, manifesting as "commitment to their local surroundings, engage in community work or provide a gathering space for community meetings at night" (Merkel 2015: 134). Management research documents that these spaces function as semi-public venues, offering community services and furnishing communal gathering spaces. Management scholars investigating collaborative organisations focus on the characteristics of users themselves, business models, functionalities, and impacts on users and surrounding environments. This literature documents that individuals within these settings operate both independently and collectively, with

some aligning themselves with broader social movements' values. Management sciences collectively frame NWS in terms of users and their social interactions.

However, whilst management literature provides substantial insights into organisational dynamics and social mechanisms within NWS, these findings have not been systematically integrated with geographical approaches to spatial analysis. The rich understanding of community formation processes, knowledge exchange mechanisms, and resource governance models developed by management scholars presents significant opportunities for enhancing geographical research on collaborative spaces.

Management research reveals organisational patterns with clear spatial implications that merit geographical investigation. For instance, the documented tendency of NWS to emerge through local activist networks suggests specific locational dynamics that could inform a geographic analysis of innovation clusters.

Similarly, the documented intermediary roles of NWS between different sectors suggest territorial functions that geographical research could examine more systematically.

For researchers in economic geography and spatial planning, management insights suggest the following areas where organisational understanding could enhance a geographical analysis:

- How do skills transfers and peer learning within NWS attract specific types of users and businesses to particular locations, influencing local innovation patterns?
- How do different types of NWS (corporate vs grassroots, technology-focused vs craft-oriented) cluster in different parts of cities or regions?
- How do different approaches to sharing equipment and space position NWS as community assets, influencing their ability to secure public funding, partner with local authorities, and demonstrate social value to justify planning permissions and municipal support?
- Do NWS use their collaborative approach to negotiate with local councils and position themselves as social infrastructure rather than purely commercial ventures? If so, how?

This research agenda demonstrates how management insights can inform a geographical analysis of NWS, contributing to a more comprehensive understanding of how these organisational forms function within territorial systems and influence place-based development processes.

2.4. Conclusion

This literature review successfully facilitates the transfer of knowledge between management sciences and socioeconomic geography in the context of NWS. It provides conceptual tools that can enhance the spatial analysis of collaborative

spaces. It also reveals that management research has identified organisational mechanisms of NWS, the further exploration of which could be beneficial to socioeconomic geography. Organisational research shows, among other things, that NWS infrastructure serves individual creators and teams or start-ups operating within flat hierarchical structures (Brafman, Beckstrom 2006), and that their culture of sharing translates into a particular decision-making process (Fuzi 2015), as discussed in previous sections.

These organisational characteristics may have implications for research outside the management discipline, providing valuable starting points to deepen our understanding of how NWS operate in territorial contexts and influence local economic dynamics.

This review contributes to the development of an interdisciplinary approach to studying collaborative spaces. The proposed research agenda demonstrates the potential contributions of organisational arrangements to the field of socioeconomic geography. Future research can build on these themes to explore how they manifest in different spatial contexts and contribute to place-based development processes.

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References

Akhavan M., Astolfi L., Canevari A., Mariotti I., 2018, *Coworking Spaces and New Social Relations: A Focus on Italy*, [in:] *City Street3 Conference, Notre Dame University Louaize (FAAD), 31 October – 3 November, Lebanon* (pp. 1–18). LBN. https://doi.org/10.3390/urbansci3010002

Akhavan M., Hölzel M., Leducq D., 2023, *Introduction to the Effects of the COVID-19 Pandemic on Coworking*, [in:] M. Akhavan, M. Hölzel, D. Leducq (eds), *European Narratives on Remote Working and Coworking During the COVID-19 Pandemic*, SpringerBriefs in Applied Sciences and Technology(), Springer, Cham. https://doi.org/10.1007/978-3-031-26018-6_1

Allen D.W., 2017, Hackerspaces as entrepreneurial anarchy, Available at SSRN 2749016. https://doi.org/10.2139/ssrn.2749016

Ananian P., Shearmur R., Borde M.A., Lachapelle U., Paulhiac F., Tremblay D.G., Rodrigue T., 2024, *Coworking spaces in Montreal (Canada): Moving beyond classic location patterns*, "Geoforum", 152, 104016. https://doi.org/10.1016/j.geoforum.2024.104016

Anderson C., 2012, *Makers: The new industrial revolution*, Crown, New York.

Assenza P., 2015, *If you build it will they come? The influence of spatial configuration on social and cognitive functioning and knowledge spillover in entrepreneurial co-working and hacker spaces,* "Journal of Management Policy and Practice", 16(3): 35–48.

Bednář P., Mariotti I., Rossi F., Danko L., 2021, *The Evolution of Coworking Spaces in Milan and Prague: Spatial Patterns, Diffusion and Urban Change,* [in:] M. Orel, O. Dvouletý, V. Ratten (eds), *The Flexible Workplace. Human Resource Management*, Springer, Cham. https://doi.org/10.1007/978-3-030-62167-4_4

Beltagui A., Sesis A., Stylos N., 2021, *A bricolage perspective on democratising innovation: The case of 3D printing in makerspaces*, "Technological Forecasting and Social Change", 163, 120453. https://doi.org/10.1016/j.techfore.2020.120453

Bosworth G., Whalley J., Fuzi A., Merrell,I., Chapman P., Russell E., 2023, *Rural co-working: New network spaces and new opportunities for a smart countryside*, "Journal of Rural Studies", 97: 550–559. https://doi.org/10.1016/j.jrurstud.2023.01.003

Botsman R.R., Rogers W., 2011, *How Collaborative Consumption is Changing the Way We Live*, ed. R. Botsman, R. Rogers, HarperCollinsPublishers, London.

Bouncken R., Clauß T., Reuschl A., 2016, *Coworking-spaces in Asia: A Business Model Design Perspective*.

Bouncken R.B., Fredrich V., Ritala P., Kraus S., 2018, *Coopetition in new product development alliances: advantages and tensions for incremental and radical innovation*, "British Journal of Management", 29(3): 391–410. https://doi.org/10.1111/1467-8551.12213

Bouncken R.B., Reuschl A.J., 2016, *Coworking-spaces: How a phenomenon of the sharing economy builds a novel trend for the workplace and for entrepreneurship*, "Review of Managerial Science", 1–18. https://doi.org/10.1007/s11846-016-0215-y

Brafman O., Beckstrom R.A., 2006, *The starfish and the spider: The unstoppable power of leaderless organizations*, Penguin, New York.

Brouwer A.E., Mariotti I., 2023, *Remote Working and New Working Spaces During the COVID-19 Pandemic – Insights from EU and Abroad*, [in:] M. Akhavan, M. Hölzel, D. Leducq (eds), *European Narratives on Remote Working and Coworking During the COVID-19 Pandemic*, "SpringerBriefs in Applied Sciences and Technology"(), Springer, Cham. https://doi.org/10.1007/978-3-031-26018-6_2

Browder R.E., Aldrich H.E., Bradley S.W., 2019, *The emergence of the maker movement: implications for entrepreneurship research*, "Journal of Business Venturing", 34: 459–476. https://doi.org/10.1016/j.jbusvent.2019.01.005

Burret A., Pierre X., 2014, *The added value of co-working spaces in the area of business development support: Encouraging peer networks*, "Revue de l'Entrepreneuriat", 13(1): 51–73. https://doi.org/10.3917/entre.131.0051

Butcher T., 2016, *Co-working communities: Sustainability citizenship at work*, [in:] R. Horne, J. Fien, B.B. Beza, A. Nelson (eds), *Sustainability Citizenship in Cities: Theory and practice. Advances in Urban Sustainability*, Routledge, Abingdon–Oxon: 93–103.

Capdevila I., 2015, *Co-working spaces and the localised dynamics of innovation in Barcelona*, "International Journal of Innovation Management", 19(03), 1540004. https://doi.org/10.1142/S1363919615400046

Capdevila I., 2017, *Knowing communities and the innovative capacity of cities*, "City, Culture and Society". https://doi.org/10.1016/j.ccs.2017.05.003

Castilho M.F., Quandt C.O., 2017, *"Convenience Sharing" or "Community Building": Collaborative capability in coworking spaces*. In 28th ISPIM Innovation Symposium. Composing the Innovation Symphony, 18–21 June, Vienna.

Chon H., Abu Bakar N.H., 2018, *Collective Individualism in Design. To Get There: Designing Together. Cumulus Conference Proceedings Paris 2018*, Cumulus International Association of Universities and Colleges of Art, Design and Media.

Dale K., Burrell G., 2007, *The spaces of organisation and the organisation of space: Power, identity and materiality at work*, Palgrave Macmillan, Basingstoke. https://doi.org/10.5040/9781350389373

Dandoy A., 2016, *Collaborative communities and their roles in education in the city* (No. hal-01919899).

Danko L., Bednář P., Lux G., Kalman J., Belvončíková E., Horeczki R., Bálint D., 2024, *Coworking Spaces and Mid-Sized Cities in Peripheral Contexts: Conceptualising Development Trajectories*, "Tijdschrift voor economische en sociale geografie", 115(5): 706–720. https://doi.org/10.1111/tesg.12622

D'Andria A., Gabarret I., 2017, The entrepreneurial connection, [in:] A. d'Andria, I. Gabarret (eds), Building 21st century entrepreneurship, pp. 73–92, Wiley, London. https://doi.org/10.1002/9781119419709.ch4

Derviş H., 2019, *Bibliometric analysis using Bibliometrix an R Package*, "Journal of Scientometric Research", 8(3): 156–160. https://doi.org/10.5530/jscires.8.3.32

Diez T., 2012, *Personal fabrication: Fab labs as platforms for citizen-based innovation, from microcontrollers to cities*, "Nexus Network Journal", 14(3): 457–468. https://doi.org/10.1007/s00004-012-0131-7

Dougherty D., 2012, *The maker movement*, "Innovations", 7(3): 11–14. https://doi.org/10.1162/INOV_a_00135

van Eck N.J., Waltman L., 2017, *Citation-based clustering of publications using CitNetExplorer and VOSviewer*, "Scientometrics", 111(2): 1053–1070. https://doi.org/10.1007/s11192-017-2300-7

Frick J.A., 2015, *A comparative study of entrepreneurial clusters and co-working spaces in Norway: The sudden boom of private initiatives from 2010–2015*, [in:] *Operations Management for Sustainable Competitiveness*, 22nd Conference of European Operation Management Association (Euroma 2015), June 26–July 1, Neuchatel, Switzerland.

Fuzi A., 2015, *Co-working spaces for promoting entrepreneurship in sparse regions: the case of South Wales*, "Regional Studies, Regional Science", 2(1): 462–469. https://doi.org/10.1080/21681376.2015.1072053

Fuzi A., Clifton N., Loudon G., 2014, *New in-house organizational spaces that support creativity and innovation: the co-working space*, R&D Management Conference 2014, 3–6 June, Stuttgart.

Gandini A., 2015, *The rise of coworking spaces: A literature review*, "Ephemera Journal: Theory and Politics in Organisation", 15(1): 193–205.

Gauntlett D., 2011, *Media studies 2.0 and other battles around the future of media research*.

Gertner D., Mack E., 2017, *The Entrepreneurial Orientation (EO) of incubators, accelerators and co-working spaces*, "International Journal of Regional Development", 4(2): 1–24. https://doi.org/10.5296/ijrd.v4i2.10210

Gerdenitsch C., Scheel T.E., Andorfer J., Korunka C., 2016, *Coworking spaces: A source of social support for independent professionals*, "Frontiers in Psychology", 7, 581. https://doi.org/10.3389/fpsyg.2016.00581

Grant M.J., Booth A., 2009, *A typology of reviews: an analysis of 14 review types and associated methodologies*, "Health Information & Libraries Journal", 26(2): 91–108. https://doi.org/10.1111/j.1471-1842.2009.00848.x

DeGuzman G.V., Tang A.I., 2011, *Working in the unoffice: A guide to coworking for indie workers, small businesses and nonprofits*, Night Owls Press LLC.

Hackley C., 2013, *Marketing in context: Setting the scene*, Springer. https://doi.org/10.1057/9781137297112

Hatch M., 2013, *The maker movement manifesto: Rules for innovation in the new world of crafters, hackers and tinkerers*, McGraw Hill Professional, New York.

Holienka M., Racek F., 2015, *Coworking spaces in Slovakia*, "Management Review", 9(2): 29–43.

van Holm E.J., 2014, *What are Makerspaces, Hackerspaces and Fab Labs?* Available at SSRN: https://ssrn.com/abstract=2548211 or http://dx.doi.org/10.2139/ssrn.2548211

Huang H., Liu Y., Liang Y., Vargas D., Zhang L., 2020, *Spatial perspectives on coworking spaces and related practices in Beijing*, "Built Environment", 46(1): 40–54. https://doi.org/10.2148/benv.46.1.40

Hurry C.J., 2012, *The Hub Halifax: A qualitative study on coworking*, MBA Research Project, St. Mary's University, Halifax, Nova Scotia.

Janssens F., Glänzel W., De Moor B., 2008, *A hybrid mapping of information science*, "Scientometrics", 75(3): 607–631. https://doi.org/10.1007/s11192-007-2002-7

Kostakis V., Niaros V., Giotitsas C., 2015, *Open source 3D printing as a means of learning: An educational experiment in two high schools in Greece*, "Telematics and informatics", 32(1). https://doi.org/10.1016/j.tele.2014.05.001

DeKoven B., 2002, *The well-played game: A playful path to wholeness*, iUniverse, Bloomington.

de Lange T., Wittek L., 2018, *Creating shared spaces: developing teaching through peer supervision*, "Mind, Culture and Activity", 25: 1–16. https://doi.org/10.1080/10749039.2018.1544645

Leducq D., Demazière C., 2023, *Narratives on COVID-19 Effects on Coworking Spaces in France: A Winning Ticket for the Peripheries?*, [in:] M. Akhavan, M. Hölzel, D. Leducq (eds), *European Narratives on Remote Working and Coworking During the COVID-19 Pandemic*, SpringerBriefs in Applied Sciences and Technology(), Springer, Cham. https://doi.org/10.1007/978-3-031-26018-6_4

Levy S., 2001, *Crypto: How the code rebels beat the government – saving privacy in the digital age*, Penguin.

Mariotti I., Akhavan M., Rossi F., 2023, *The preferred location of coworking spaces in Italy: an empirical investigation in urban and peripheral areas*, "European Planning Studies", 31(3): 467–489. https://doi.org/10.1080/09654313.2021.1895080

Mariotti I., Di Vita S., Akhavan M (2021), *New Workplaces-Location Patterns, Urban Effects and Development Trajectories* (pp. 53–63), Springer International Publishing, Cham. https://doi.org/10.1007/978-3-030-63443-8_4

Mariotti I., Pacchi C., 2021, *Coworkers and coworking spaces as urban transformation actors. An Italian perspective*, [in:] I. Mariotti, S. Di Vita, M. Akhavan (eds), *New workplaces – location patterns, urban effects and development trajectories. Research for development*, pp. 53–63, Springer, Cham. https://doi.org/10.1007/978-3-030-63443-8_4

Maxigas P., 2012, *Hacklabs and hackerspaces: Tracing two genealogies*, "Journal of Peer Production", 2.

McKay G. (ed.), 1998, *DiY culture: party and protest in nineties' Britain*, Verso.

Méndez-Ortega C., Smit M.J., Micek G., 2024, *Location patterns and drivers of coworking spaces in European regions*, "Tijdschrift voor economische en sociale geografie", 115(2): 281–301. https://doi.org/10.1111/tesg.12603

Méndez-Ortega C., Micek G., Malochleb K., 2022, *How do coworking spaces coagglomerate with service industries?*, "The tale of three European cities. Cities", 130, 103875. https://doi.org/10.1016/j.cities.2022.103875

Micek G., Baycan T., Lange B., 2024, *A Taxonomy of New Working Spaces*, [in:] I. Mariotti, E. Tomaz, G. Micek, C. Méndez-Ortega (eds), *Evolution of New Working Spaces*, "SpringerBriefs in Applied Sciences and Technology"(). Springer, Cham. https://doi.org/10.1007/978-3-031-50868-4_3

Moriset B., 2014, *Building new places of the creative economy. The rise of coworking spaces*, proceedings of the 2nd Geography of Innovation, International Conference 2014, Utrecht University, Utrecht (The Netherlands).

Mengual P., Danzinger F., Roth A., 2023, *Physical interaction platforms: A taxonomy of spaces for interactive value creation*, Creativity and Innovation Management.

Oldenburg R., 1989, *The great good place: Cafés, coffee shops, community centers, beauty parlors, general stores, bars, hangouts and how they get you through the day*, Paragon House Publishers, Vadnais Heights, Minnesota.

Paré G., Trudel M.C., Jaana M., Kitsiou S., 2015, *Synthesizing information systems knowledge: A typology of literature reviews*, "Information & Management", 52(2): 183–199. https://doi.org/10.1016/j.im.2014.08.008

Pompa L., 2017, *From the unusual to the useful: Digital platforms and co-working spaces as instruments for human resource management in emerging economic and organizational environments*, "International Journal of Business and Management", 12(8): 143–159. https://doi.org/10.5539/ijbm.v12n8p143

Qiu Y., Bouncken R.B., Arndt F., Ng W., 2023, *Microfoundations and dynamics of do-it-yourself ecosystems*, "Technological Forecasting and Social Change", 193, 122611. https://doi.org/10.1016/j.techfore.2023.122611

Raffaele C., Connell J., 2016, *Telecommuting and co-working communities: What are the implications for individual and organizational flexibility?* [in:] J. Connell, J. Burgess (eds.), *Flexible work organizations: The challenges of capacity building in Asia*, pp. 21–35, Springer, London. https://doi.org/10.1007/978-81-322-2834-9_2

Ratto M., Boler M., 2014, *DIY Citizenship, Critical Making and Social Media*, The MIT Press, 10, 2.

Schmidt S., Brinks V., 2017, *Open creative labs: Spatial settings at the intersection of communities and organizations*, "Creativity and Innovation Management", 26(3): 291–299. https://doi.org/10.1111/caim.12220

Smit M.J., Schutjens V., Brouwer A., 2023, *Not going back to the office any time soon: Coworking spaces in The Netherlands*, [in:] M. Akhavan, M. Hölzel, D. Leducq (eds), *European narratives on remote working and coworking during the COVID-19 pandemic: A multidisciplinary perspective*, pp. 63–72, Springer, Nature Switzerland. https://doi.org/10.1007/978-3-031-26018-6_7.

Soerjoatmodjo G., Bagasworo D., Joshua G., Kalesaran T., van den Broek K., 2015, *Sharing workspace, sharing knowledge: Knowledge sharing amongst entrepreneurs in Jakarta co-working spaces*, International Conference on Intellectual Capital and Knowledge Management and Organisational Learning (p. 259), Academic Conferences International Limited.

Spreitzer G., Bacevice P., Garrett L., 2015, *Why people thrive in coworking spaces*, "Harvard Business Review", 93(7): 28–30.

Tomaz E., Henriques C., 2023, *The evolution and spatial dynamics of coworking spaces in Lisbon: a qualitative analysis*, "Cidades. Comunidades e Territórios", 46. https://doi.org/10.15847/cct.31140

Tomaz E., Moriset B., Teller J., 2022, *Rural coworking spaces in the COVID-19 era: A window of opportunity?*, [in:] *The COVID-19 pandemic and the future of working spaces*, pp. 122–135, Routledge. https://doi.org/10.4324/9781003181163-12

Walter-Herrmann J., 2013, *Fab Labs – A Global Social Movement*, FabLab: Of machines, makers and inventors. https://doi.org/10.1515/transcript.9783839423820

Van Weele M.A., Van Rijnsoever F.J., Steinz H., 2014, *Start-ups down under: How start-up communities facilitate Australian entrepreneurship*, In DRUID (Dynamics of Organizations, Industries, Systems and Regions) Society Conference, Copenhagen Business School, Copenhagen, June 16–18 (27 pp.).

Wolf M., McQuitty S., 2011, *Understanding the do-it-yourself consumer: DIY motivations and outcomes*, "AMS Review", 1(3). https://doi.org/10.1007/s13162-011-0021-2

Zakoth D., Mauroner O., Emes J., 2023, *The role of makerspaces in innovation processes: an exploratory study*, R&D Management. https://doi.org/10.1111/radm.12594

Zhai L., 2021, *How do socioeconomic and urban form factors affect the spatial distribution of coworking spaces? The case of Shanghai, China*, University of Washington.

Zhang S., Mendez-Ortega C., Mariotti I., 2024, *Location dynamics of coworking spaces in China: Insights from Beijing metropolitan*, "Regional Studies, Regional Science", 11(1): 523–541. https://doi.org/10.1080/21681376.2024.2381641