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Exploring Empowerment in Construction: Discovering Challenges of self-managed Workers

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Abstract. Traditionally, production planning and control (PP&C) approaches in construction have been hierarchical and rigid. These PP&C approaches have often been reported to insufficiently provide task preconditions in a dynamically changing production environment, ultimately causing stress and dissatisfaction to workers. Modern organizational and management theory promotes more agile and dynamic decentralized decision-making structures. These support workers' access to the organization's resources and provide preconditions to implement their individual ideas. Such empowerment is linked to increased subjective well-being and project performance. However, several studies present workers' perceptions of their own task responsibility and decision-making as empowered, self-managed, and decentralized, while satisfaction remains low and productivity rates stagnated over the last decades. Thus, this research studies qualitatively factors promoting empowerment of workers and what kind of challenges workers face in perceived decentralized work environments. Semi-structured interviews with 14 mechanical, electrical, and plumbing (MEP) workers were conducted and analysed using an empowerment-level framework. This study suggests that leadership dynamics among MEP workers are contingent on the tasks and their preconditions, transitioning from centralized in design stages to decentralized during execution. Empowerment structures mirror this shift, evolving through actions either delegated or seized based on individuals and groups managing task demands effectively. The findings suggest that the level of leadership and empowerment is tacitly and collectively coordinated by management and workers through informal verbal exchanges and situational cues, which often leads to unclear and chaotic situations. In summary, the study highlights the advantages and disadvantages of undifferentiated empowerment structures and emphasizes the need for advanced in-depth understanding and exploration of dynamically changing empowerment and leadership structures.

1. Introduction

Construction projects have historically relied on hierarchical and rigid production planning and control (PP&C) methods[1]. These methods prioritize centralized decision-making by management, leading to a disconnect between managerial decisions and workforce execution [2]. Employees are often seen as implementers of predetermined plans, with limited involvement in decision-making processes[3], [4]. However, these conventional approaches



struggle to adapt to the dynamic construction environment, resulting in inadequate project planning and information distribution, which contributes to subjective task planning and control activities and dissatisfaction by workers [5], [6].

Conversely, contemporary management theory emphasizes the importance of adapting to dynamic environments while maintaining competitiveness [7], [8]. It advocates for agile and decentralized decision-making structures that empower workers to access resources and implement their ideas. This shift aims to enhance subjective well-being and improve project performance by facilitating task and human resource coordination based on worker's needs [4], [9], [10]. With the help of structured systems and a supportive management framework, organizations can strive for effective management practices promoting employee empowerment and individual competency development for enhanced performance and competitiveness.

However, recent studies indicate that while workers perceive themselves as empowered and decentralized decision-makers [1], [11], satisfaction remains low, and productivity stagnates. Hence, there is a need to qualitatively examine the factors that promote worker empowerment and the challenges they face in perceived decentralized work environments.

Although construction workers are traditionally seen as low-influence individuals with little planning and decision-making power in centrally managed projects, several researchers have explored the potential of decentralized management practices [1], [5], [11]–[13].

Therefore, semi-structured interviews with 14 mechanical, electrical, and plumbing (MEP) workers in four projects have been conducted to explore the following research question: “What factors workers perceive empowering and what challenges arise from it”. The study aims to provide worker-centric insights into perceptions of empowerment structures within the unique context and complexity of construction projects. Ultimately, this research contributes to the ongoing discourse on empowering workers and fostering a more inclusive and productive construction environment.

2. Literature Review

2.1 Historical Instances of Empowerment

In the Western context, empowerment is historically associated with the freedom granted to an individual or group by another powerful person. In earlier eras, autonomy away from a master seemed unlikely, and social cohesion was based on the dynamic between master and individual [14]. In another instance, King John delegated decision-making powers in the 13th century in the face of financial pressure for the Crusades to prevent a baron-led revolt [15]. Until the late Middle Ages, social hierarchies focused on land ownership, but with the emergence of a modern, social and urban order, the perspective changed. Society changed from what was perceived as a natural dependency structure to a product of human ingenuity and logical reasoning [14]. From then on, the challenge for governance and leadership lay in the ambivalence of individuality, which has qualities for social cohesion but also poses a potential threat of self-interest. Societies adapt by developing mechanisms to contain anti-social forces, which emphasizes the ongoing evolution of empowerment amidst changing notions of freedom and individualism [15].

In essence, traditional power structures were viewed as ingrained and unchallengeable, influencing individuals for centuries. Power shifts often occur to maintain authority or in reaction to inefficient systems. With increasing belief in decentralized decision-making, human reason drives restructuring away from established frameworks, fostering new approaches for coordinating individuals while respecting their autonomy.

2.2 Management Theory understanding Empowerment

In modern organizations, management theory emphasizes both competitiveness and adaptability to fast-paced changes. This involves operational and strategic procedures to coordinate tasks and human resources efficiently [7]. Structured systems and supportive management frameworks facilitate effective management practices, promoting employee empowerment and individual competency development, crucial for overall performance and competitiveness.

As employees are crucial to organizational success, it is important to create a supportive work environment for them enabling smooth workflows [16]. Especially in dynamic and complex environments, the success of an organization depends on the skills and motivation of its employees [17]. It is therefore essential for managers to emphasize workers needs and create a healthy working environment in which they feel supported and empowered [18]. A supportive management framework that enables empowerment is the willingness of upper management to support employees' decision making and efficiently manage the resources that enable their self-directed task performance by using the organization's resources to put their ideas into action [19].

This is echoed, for example, in modern lean manufacturing management principles "respect for people" coming from the lean Toyota Production System [20]. Empowerment granted to employees significantly impacts their job satisfaction [9], [18] and productivity [10]. Therefore, empowerment ("respect for people") can be viewed as a management strategy aimed at increasing productivity and assigning power to employees, by promoting a human-centred approach to enhancing the work life and environment [20], [21].

2.2.1 Construction Management Perception of Empowerment. The construction sector, a key player in the global economy, heavily relies on skilled manual labour within its fragmented and dynamic project organizations [22]. This fragmentation presents an opportunity for implementing empowering techniques and fostering a more inclusive workplace culture [17]. Despite acute labour shortages worldwide, there's been slow adoption of empowerment strategies due to short-term performance pressures, hindering the transition from traditional static and hierarchical management to more flexible and collaborative approaches that empower workers [17], [23], [24], [25].

In the traditional construction management approach, known as "management as planning" [26], planning and decision-making authority flows down the hierarchy, with high-level plans assumed sufficient for workers to execute [27]. Site managers and general managers are pivotal in distributing task information and making decisions, primarily viewing decision-making as centralized since they maintain to have control over schedules and progress [1]. Despite considering input from crew leaders and workers in this management approach workers are seen as having limited empowerment and their knowledge and expertise are often overlooked in project planning and decision-making [1], [22].

2.2.2 Worker Perception of Empowerment and its Consequences. Construction workers struggle often due to inaccessible and outdated information [28], leading to difficulties in decision making and a centralization of decision-making power among project managers, even for task-related matters [12]. However, different studies report that workers perceive themselves as empowered with autonomous decision-making authority, also highlighting the disadvantages of empowerment. Interviews with drywall workers show that workers actively plan, coordinate tasks, and make independent decisions to overcome these challenges, often compensating for

missing or delayed information, which may result in tasks not being performed in the correct order or wasted efforts, such as demolition of incorrectly built walls [5]. Other interviews report a decreasing intensity of relationships between managers and workers, as younger supervisors tend to increasingly rely on remote and digital means of communication rather than face-to-face interaction, leading to an elevation of independent decision-making [6]. Workers also feel empowered in proactively coordinating their tasks with previous and subsequent work from other trades, which are often inadequately addressed in management plans and instructions [5], [11]. [1] contrasts workers' perceptions with those of managers, noting that workers feel a significant responsibility and autonomy in coordinating PP&C, particularly regarding daily and weekly activities, while managers operate at higher hierarchical levels. As a result, workers believe they possess the most comprehensive understanding of weekly, daily, and production progress tasks [1].

The subjective decisions made in the form of independently carried out activities, e.g., to compensate for missing information, are described as task planning and control (TP&C) activities which do not add direct value to a task and add complexity in an already highly complex field often described as suffering from chaotic and low productivity levels. Consequently, workers spend a considerable amount of time on TP&C activities to start and facilitate installation work, which disturbs direct work and lowers the amount of time available for installation work [2], [11].

3. Methods

The interviews were part of a comprehensive study initiated by various Finnish MEP employer unions with interest in enhancing productivity. The study aimed to understand factors that impede workflows. One aspect of this multipurpose study was examining workers' perceptions of empowerment, as it is widely believed to significantly influence job satisfaction [9], [18] and productivity [10]. Empowerment involves employees actively participating in decision-making processes regarding their tasks and being granted authority to make final decisions. [19], [29]. Since individuals' perceptions of their participation and authority can vary greatly, interviews were chosen as the research method [30]. Conducting individual interviews enabled a comprehensive exploration of participants' perspectives and ideas, yielding valuable insights into their views.

The study aimed to assess worker empowerment perceptions across various construction projects. However, due to COVID-19 limitations, several selected projects were excluded due to on-site exposure. Despite union support, obtaining consent was challenging due to COVID-19 concerns and time constraints. To address this, on-site presentations were conducted by the principal investigator, facilitating recruitment. Ultimately, semi-structured interviews were conducted with 14 MEP workers across four projects. The projects comprised two multifamily building sites, one hotel and office project, and a shopping mall project, all located in Finland. All cases used BIM in design but BIM was used on site by just the hotel and office project and the shopping mall project. (see Table 1 for details). Most interviewees were Finnish-speaking, except for one Russian speaker who had a translator. Interview durations ranged from 21 to 48 minutes.

Table 1. Interview details

| No. | Profession | Duration | Site | Size (m ²) | Management approach | Special Notes |
|-----|--------------------------------|----------|----------------|------------------------|---------------------|---|
| 1 | HVAC installer | 23 min | Multifamily 1 | 7.000 | Traditional | - |
| 2 | Electrical installer & foreman | 34 min | | | | |
| 3 | Electrical installer | 21 min | | | | |
| 4 | Plumber | 29 min | Shopping mall | 135.000 | Lean | Takt Planning, BIM utilized on site, Minor COVID-19 schedule delays |
| 5 | Plumber (+ his translator) | 40 min | | | | |
| 6 | Electrical installer | 40 min | | | | |
| 7 | Electrical installer | 45 min | | | | |
| 8 | Electrical installer & foreman | 40 min | Hotel & office | 22.000 | Traditional | BIM utilized on site, Major COVID-19 schedule delays |
| 9 | Electrical installer & foreman | 34 min | | | | |
| 10 | Plumber, foreman | 44 min | | | | |
| 11 | Plumber | 48 min | Multifamily 2 | 4.000 | Traditional | Design changes, Modular bathrooms |
| 12 | Electrical installer & foreman | 41 min | | | | |
| 13 | Plumber | 33 min | | | | |
| 14 | Plumber, foreman | 28 min | | | | |

The interview data was transcribed, and then analysed and coded in Atlas.ti. Each code is unique and traceable to the original Finnish expression in the transcription. The coding used pre-defined categories for the analysis of empowerment, based on [29] division into individual, group, and social empowerment. In addition, the data were coded for other challenges related to empowerment [23], [31]. Thus, the coding process used the following coding scheme: 1) individual expressions of empowerment, 2) group expressions of empowerment, 3) expressions of decision-making transitions (delegation of power), and 4) expressions of empowerment challenges. While these codes sometimes overlapped in quotations, they could still be clearly identified from the interviews. Some open codes were also used but were of limited importance and are not included in this study. The codes were numbered based on the software's system, with the first digit representing the interviewee number and the second digit indicating the sequence number of the coded quote (e.g., ID 1:2 denotes the second quote from interviewee 1). The coded and interpreted expressions were then analysed according to Figure 1.

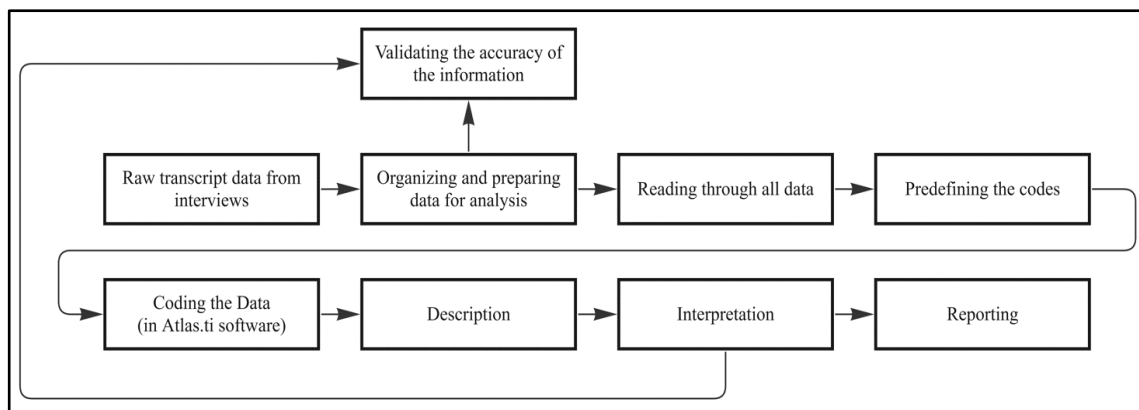


Figure 1. Data analysis process

To ensure the validity and reliability of the interview study, four sites in different locations with different main contractors and subcontractors were used. The interviewing, transcription, and coding processes were carried out by different individuals, none of whom were employed by the companies surveyed but by the university. The study aimed to provide a comprehensive set of quotations within the limits of the length of the paper.

4. Findings

4.1 Empowerment Challenges

The interviews pointed to several challenges related to empowerment. A lack of clarity about decision-making power emerged in the interviews, possibly indicating a lack of clear communication channels in these cases: "[...] you don't even know who is the foreman in charge of which area, or who you should contact about which issue." (ID 7:16). Additionally, workers often seem to have to seek approval for decisions from their supervisor or boss, which seemed to delay the workflow and is a sign of a hierarchical structure which limits autonomous working: "[...] this hierarchy [...] brings a lot of slowness. The fact that when we don't get to make a change, if we don't necessarily get approval from the designer." (ID 14:20). Workers did not feel empowered to make certain decisions, on which they seemed to have relatively clear views from an on-site perspective. The design change process also seemed bureaucratic and slow, as indicated by the gap between on-site workers and designers, which made workers feel frustrated and powerless due to long waiting times for decisions: "[...] then you start to go to the point where the first thing you do is call my boss and say: this can't be done this way, can I do this that way. Then he calls perhaps the foreman, this foreman calls the designer, or then our boss calls the designer. Then the designer starts thinking and calculating some diagrams, and then it's just waiting." (ID 14:20). Quotes may also indicate that there is no clear leadership or organization on the site, which may make workers feel insecure about decision-making power. On the other hand, direct communication between workers seemed to work, but the need for workers to follow the hierarchy that characterizes construction often emerged: "Sometimes we do them ourselves, when we are tired of waiting for someone to come and do them [...]" (ID 10:1).

There were also some indications in the interviews that workers speaking different languages were unable to communicate within the team, which seemed to lead to the need for bilinguals or intermediaries, a form of communication through another person: "...in the meantime, there is no need to call a foreman, if someone who speaks Finnish, an electrician, who speaks only Finnish, then it could be quicker to solve problems, not having to wait for a foreman who speaks Finnish and can explain to him, or then explain to the other party what is being done [...] that would be cooperation [...] in a way, our foreman explains pretty well and before starting work, that what is being done, and in his native language." (ID 4:6).

4.2 Individual Empowerment through Personal Actions

Through the challenged expressions, it was possible to identify empowerment through personal actions. For example, interviewees seemed willing and able to take initiatives such as drilling new boreholes themselves or fixing problems such as those related to cruises in the plans themselves: "[...] now we would start telling someone that we want that new drill hole [...] so it would take an awful lot of time from us [...] if we make the hole ourselves, it's easier." (ID 2:5).

Interviewees also expressed a desire for greater autonomy to solve problems on site rather than waiting for instructions from others, which often led to long waiting times and reduced

work output. They expressed a need to come up with their own solutions to push the project forward: “[...] that design and all that takes quite a lot of time, so we designed it on site [...]” (ID 5:12). This can be seen as a positive aspect of empowerment, but it can also indicate systemic problems that require workers to be adaptable in this way. Interviewees seemed to cope with technical and logistical challenges largely on their own, often without the support of their supervisors, highlighting the mismatch between planning and implementation. While these expressions can be interpreted as signs of individual empowerment, a certain compulsion to fill these systemic gaps with initiative and ingenuity can also be interpreted from the interviews.

4.3 Mutual Empowerment through Group Activities

From the interviewees’ expressions, we can identify a collaborative, mutually empowering approach. This is evident, for example, in the importance of communication and teamwork when different contractors are involved. Communication technology is referred to in several comments, and WhatsApp groups are mentioned as a tool for quick communication between contractors, facilitating faster decision making and problem solving, although they acknowledge that this does not always work perfectly due to busy schedules: “We have our own WhatsApp group with our contractors, where we sometimes get quick answers, but the team doesn’t always have time to look at the phone [...]” (ID 6:3).

Interviewees also referred to the need to discuss and negotiate the status and coordination of their tasks directly with each other rather than relying solely on plans or instructions from the foreman. In situations where workers must adjust the drawings themselves due to errors and omissions in them, they described close collaboration between different trades to avoid conflicts in the positioning of, for example, ventilation, electrical and plumbing systems: “Those are usually the problems that you should [get] the drawings to overlap: electricity, air, plumbing. So many times, they clash. Well, yes, of course, it is when the professionals are here on site, so we look through them anyway. That “Okay, if I go that way, you go that way” and we agree like this.” (ID 14:9). The responses revealed the existence of people dedicated to team logistics who organize the placement and retrieval of materials on behalf of the team. It seems that this coordination would make it easier to find materials and tools. Mutual empowerment emerged in situations where, instead of waiting for instructions or help from management, the teams themselves took the initiative to move materials or solve problems, and this was also perceived as a more efficient use of time. They had to plan and carry out tasks on their own initiative that were not coordinated by supervisors or well designed by designers. Interviewees described situations in which materials and tasks were not optimally organized, which meant that they themselves had to manage site logistics to ensure that work could continue: “...we asked the construction company if they could move the stuff from there some time before, but nothing happened there, so we were the ones left with it then.” (ID 7:1).

It seems that teams discuss with each other how to use materials and equipment, choosing more durable fittings to avoid future problems with HVAC systems, reflecting a shared learning culture: “If we have some big ducts[...] [supplier X] has one of those weakly constructed[...] fittings. When you put that pipe hanging [...] and closed, it stays in the shape of an egg. If a supervisor sees it, then they have to change it [...] then we have to order [supplier Y] [...] stiffer fittings, because it's a little more expensive than [X] [...] we've [...] learned that when guys start that [HVAC] machine room, all the [...] fittings are now ordered from [supplier Y]. [Supplier X] is then used for drains and stuff like that[...]. (ID 11:3).

Workers seem to feel a shared responsibility to ensure that work runs smoothly, as illustrated by the quote below, which describes a situation in which efforts are made to ensure

that all team members have work to do despite challenges on site. This also seems to involve adapting and redistributing tasks according to the progress and availability of other teams: “[...] my main task, apart from trying to work as much as possible myself, is to make sure that [other team member] at least has work all the time. So, one of us is able to work almost at full capacity, so I have to make sure that there is enough stuff, pipe [and] everything else that [other team member] can do all the time. And then I try to do the investigations myself on the side, if there are changes, and so on. And then do something anyway...” (ID 14:11).

4.4 Delegation of Decision-Making Power

The delegation of decision-making power on construction sites is often a complex dance of trust, expertise, and coordination, as workers’ experiences show. On the one hand, there is inherent trust in the expertise of workers, and supervisors rely on their judgment to carry out tasks and solve problems: “[...] I’ve had very little contact with any of those foremen anyway, but they do appreciate our so-called expertise, that they trust that we know and tell them what we’re doing [...]” (ID 7:18).

This trust and delegation of decision-making also extends to the ordering of supplies and equipment, where workers are expected to anticipate needs and take the initiative, even though errors in the system sometimes lead to miscalculations or the need for repairs: “[...] in a way, we order [material]. [...] if we make all the forms ready where the supplies are, then our foreman should order according to them, but then at some point there’s an error...I’ve understood or so the foreman says, that there’s always those errors in the systems, but I don’t know...” (ID 10:12).

However, this delegation of power to employees also seems to lead to unnecessary work, for example in the absence of drawings and instructions, as exemplified by the need to redo 20-30% of the work in hotel rooms because initial efforts were not directed. Responsibility often falls on a single point of contact in the work team, such as the project manager, who is bombarded with calls and decisions that can be overwhelming: “[...] we started cabling before we even had a model room, before we knew how to do it. We have had to change about 20–30% of what we have already done in those rooms, because there were no drawings and then if there were drawings and tried to approve the model room in the hotel room, then it was not always approved, and we had to move the [electrical] installations [...]” (ID 9:5). “Unfortunately, it has come to the point where the foreman takes care of everything on the site, and the foreman does what he does. Pretty much all the responsibility lies with [...] the foreman. The phone just rang [...] last week too [...] I [...] had more than 40 calls during the day [...] try to do something about it now and then.” (ID 10:7).

The interviews suggest that there is some kind of collective and tacit understanding between workers and management about the sharing of decision-making power or a form of nonverbal agreement on how to proceed in the absence of formal instructions. The findings suggest a dynamic decision-making process that is adaptive but can sometimes be chaotic. It is also noteworthy from the interviews that none of the interviewees mentioned any formal agreement on the transfer of decision-making power. In terms of social empowerment, there were no indications of it in the interviews, for example, no mentioning of trade unions or other social empowerment phenomena, nor were they observed in the coding.

5. Discussion & Conclusions

While some researchers have found that a significant part of construction management today is based on influence and persuasion rather than authority and command [32] this study tells a

different story. This study shows, based on MEP workers' perceptions, leadership seems to be a dynamic and situational concept depending on tasks and their preconditions, which varies from strictly hierarchical, in design problems, to almost no leadership during task execution, with a significant amount of task coordination and problem solving left to self-managed crews. This research shows that the degree of empowerment is delegated or seized depending on the characteristics of task situations and workplace conditions and formed through the psychological processes of the individual and the group [33]. The work on task planning and control reflects these findings, by describing decision-making as increasing collaborative, detailed, and decentralized the closer task performance gets to execution [11]. This research highlights further that the degree of leadership and empowerment are tacitly and collectively agreed by management and workers through non-formal verbal communication and other factors based on situational understanding.

For the most part, the workers expressed in the interviews a collegial attitude to other workers on site. They seem to have a good spirit in helping each other out, for example, in cases of clashes that require collaborative design work on site. This seems surprising because trades do not generally have a collective incentive to work together. This may be due to the interviews not probing deeply enough into problems of this nature. Alternatively, the social situation between workers in a shared work environment may play an important role. There is, however, evidence of some situations where the workers express frustration towards other trades due to them not getting the attention they desire (ID 14:8). Another example of this nature is (ID 8:10), where the interviewee refers to on-site coordination between the workers as "fighting", although this may be a humorous way of expression.

ID 14:16 describes a situation where the worker gets to choose their work area from which there are many available to choose. This kind of empowerment can also be counterproductive if it is caused by the foreman failing to communicate the intent of the overall schedule. The GC may have planned the proper work areas, but the worker might not be aware of it. Leaving the decision to the worker may cause interference for the subsequent trades.

Empowerment, as discussed in this paper, can in general be interpreted as positive and useful for the overall production system. However, empowerment situations described in the results can, for example, mean a trade worker taking initiative in doing logistical work to clear their work area [34]. This kind of empowerment is a sign of poor planning and weak management. Empowering trade workers to do logistical work should not be encouraged as a countermeasure to poor coordination, although it can be justified in the short term. Instead, in the longer run, the root cause of the need for this kind of empowerment should be analyzed and tackled. This interpretation is evidenced by the mostly negative and frustrated tone of the interviewees' descriptions of the situations. This research opens avenues for future research to better understand demands of leadership and empowerment within situational context and how to synchronize individual task performance without contradicting and hindering each other [15]. Furthermore, forms and impact of empowerment need to be explored further as well as causes and situations when empowerment is delegated or seized. In contrast to historical instances of empowerment, it seems construction holds naturally centralized and decentralized structures at the same time and arise often voluntarily and tacitly to manage emerging situational constraints to carry out installation work.

While our study has provided valuable insights, its analysis of perceived worker challenges was hindered by the constraints of a limited sample size and interview methodology. This limitation impedes the generalizability of our findings and underscores the need for further

investigation into how various project and management approaches, such as lean and traditional methods, affect worker empowerment outcomes. Moreover, the Finnish context accentuates these limitations, emphasizing the importance of future research embracing a more inclusive perspective.

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References

- [1] J. Lehtovaara, O. Seppänen, and A. Peltokorpi, "Improving construction management with decentralised production planning and control : exploring the production crew and manager perspectives through a multi-method approach," *Constr. Manag. Econ.*, pp. 1–24, 2022.
- [2] C. Görsch, A. Al Barazi, O. Seppänen, and H. A. Ibrahim, "Uncovering and Visualizing Work Process Interruptions through Quantitative Workflow Analysis," *Lean Constr. J.*, vol. 183, pp. 171–183, 2022.
- [3] M. Watkins, A. Mukherjee, N. Onder, and K. Mattila, "Using Agent-Based Modeling to Study Construction Labor Productivity as an Emergent Property of Individual and Crew Interactions," *J. Constr. Eng. Manag.*, vol. 135, no. 7, pp. 657–667, 2009.
- [4] V. Priven and R. Sacks, "Effects of the last planner system on social networks among construction trade crews," *J. Constr. Eng. Manag.*, vol. 141, no. 6, pp. 1–10, 2015.
- [5] M. Liinasuo, S. Tuisku-Tuuli, and C. Görsch, "Drywall Installers' Work Demands – Tackling between Normal Duties and Absurd Challenges," in *European Conference in Cognitive Ergonomics*, 2023.
- [6] M. Loosemoore, "Improving construction productivity: a subcontractor's perspective," *Eng. Constr. Archit. Manag.*, vol. 21, no. 3, pp. 245–260, 2014.
- [7] M. Y. Ghadi and K. S. A. H, "The Role of Job Crafting in the Relationship between empowering Leadership and Happiness at Work: An empirical Analysis," vol. 21, no. 1, pp. 244–251, 2020.
- [8] A. Riege, "Three-dozen knowledge-sharing barriers managers must consider," *J. Knowl. Manag.*, vol. 9, no. 3, pp. 18–35, 2005.
- [9] H. Mintzberg, *Structure in Fives: Designing Effective Organizations Main message & purpose A review of Organizational Design*. Englewood Cliffs: Prentice–Hall International, 1983.
- [10] S. B. Yang and M. E. Guy, "The Effectiveness of Self-Managed Work Teams in Government Organizations," *J. Bus. Psychol.*, vol. 26, no. 4, pp. 531–541, 2011.
- [11] C. Görsch, O. Seppänen, A. Peltokorpi, and R. Lavikka, "Task Planning and Control in Construction: Revealing Workers as Early and Late Planners," *Constr. Manag. Econ.*, vol. 0, no. 0, pp. 1–47, 2023.
- [12] A. Reinbold, O. Seppänen, and A. Peltokorpi, "The Role of Digitalized Visual Management to Empower Selfmanaged Crews in Construction Projects," in *Annual Conference of the International Group for Lean Construction*, 2020.
- [13] H. Martin, T. M. Lewis, and J. Fifi, "Centralized versus decentralized construction project structure - Easing communication difficulties," *Int. J. Constr. Manag.*, vol. 14, no. 3, pp. 156–170, 2014.
- [14] Z. Baumann, *Freedom*. Open University Press, 1988.
- [15] M. Traynor, "A brief history of empowerment: Response to discussion with Julianne Cheek," *Prim. Heal. Care Res. Dev.*, vol. 4, no. 2, pp. 129–136, 2003.
- [16] D. Amaratunga and R. Haigh, "Recognising the importance of 'Tacit' skills of the construction worker in a knowledge environment," in *ACROM Doctoral Workshop*, 2005.
- [17] A. D. F. Price, A. Bryman, and A. R. J. Dainty, "Empowerment As a Strategy For Improving Construction Performance," *Leadersh. Manag. Eng.*, vol. 4, no. 1, pp. 27–37, 2004.
- [18] E. Galván Vela, V. Mercader, E. Arango Herrera, and M. Ruíz Corrales, "Empowerment and support of senior management in promoting happiness at work," *Corp. Gov.*, vol. 22, no. 3, pp. 536–545, 2022.
- [19] G. D. Geroy, P. C. Wright, and J. Anderson, "Strategic performance empowerment model," *Empower. Organ.*, vol. 6, no. 2, pp. 57–65, 1998.
- [20] T. Ohno, *Toyota Production System: Beyond Large-scale Production*. 1988.
- [21] N. D. Lincoln, C. Travers, P. Ackers, and A. Wilkinson, "The meaning of empowerment : the interdisciplinary

- etymology of a new management concept," vol. 4, no. 3, pp. 271–290, 2002.
- [22] C. Görsch, O. Seppänen, A. Peltokorpi, and R. Lavikka, "Construction Workers' Situational Awareness – An overlooked Perspective," in *Annual Conference of the International Group for Lean Construction*, 2020, pp. 937–948.
 - [23] A. R. j. Dainty, A. Bryman, and A. D. f. Price, "Empowerment within the UK construction sector," *Leadersh. Organ. Dev. J.*, vol. 23, no. 6, pp. 333–342, 2002.
 - [24] S. Cook, "The Cultural Implications of Empowerment," *Empower. Organ.*, vol. 2, no. 1, pp. 9–13, 1994.
 - [25] J. Egan, "Rethinking Construction - The Report of the Construction Task Force," 1999.
 - [26] R. B. Johnston and M. Brennan, "Planning or organizing: The implications of theories of activity for management of operations," *Int. J. Manag. Sci.*, vol. 24, no. 4, pp. 367–384, 1996.
 - [27] A. Faisal and A. Whyte, "Employee empowerment in construction: A review of issues," *Proc. Int. Struct. Eng. Constr.*, vol. 1, no. 1, pp. 691–696, 2014.
 - [28] A. Tezel, L. Koskela, P. Tzortzopoulos, A. Koskenvesa, and S. Sahlstedt, "An examination of visual management on finnish construction sites," *Annu. Conf. Int. Gr. Lean Constr.*, pp. 115–124, 2011.
 - [29] K. E. Pigg, "Three Faces of Empowerment: Expanding the Theory of Empowerment in Community Development," *J. Community Dev. Soc.*, vol. 33, no. 1, pp. 107–123, 2002.
 - [30] M. Alvesson, "Beyond Neopositivists, Romantics, and Localists: A Reflexive Approach to Interviews in Organizational Research," *Acad. Manag. Rev.*, vol. 28, no. 1, pp. 13–33, 2003.
 - [31] E. Baker, M. Kan, and S. T. T. Teo, "Developing a Collaborative Network Organization : Leadership Developing a collaborative network organization : leadership challenges at multiple levels," *J. Organ. Chang. Manag.*, vol. 24, no. 6, pp. 853–875, 2011.
 - [32] Y. Jung, M. Goo Jeong, and T. Mills, "Identifying the Preferred Leadership Style for Managerial Position of Construction Management," *Int. J. Constr. Eng. Manag.*, vol. 3, no. 2, pp. 47–56, 2014.
 - [33] D. D. Perkins and M. Zimmerman, "Empowerment theory , research , and application," *Am. J. Community Psychol.* , vol. 23, no. 5, pp. 569–579, 1995.
 - [34] F. Hamzeh, F. Faek, and H. Al Hussein, "Understanding improvisation in construction through antecedents, behaviours and consequences," *Constr. Manag. Econ.*, vol. 37, no. 2, pp. 61–71, 2019.