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Digital Job Crafting in the Era of Artificial Intelligence: Exploring the Phenomenon Through a Socio-Technical Lens

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Abstract. This paper offers a conceptual exploration into how Artificial Intelligence (AI) and Generative AI impact job crafting. Drawing from a comprehensive review of the existing literature, the analysis leverages established theoretical frameworks on Digital Job Crafting. The study identified a range of organizational variables that influence how workers utilize AI and Generative AI tools in their work tasks. A conceptual model is proposed to describe job crafting practices facilitated by AI.

Keywords: Digital Job Crafting, Artificial Intelligence, Generative AI.

1 Introduction

Job crafting (JC) is defined as “*the physical and cognitive changes individuals make in the task or relational boundaries of their work*” [32]. These adjustments are made to better match the job to individuals’ preferences, objectives, and motivations [29], arguably leading to enhanced organizational performance [23], person-job fit [9,18], work engagement, well-being, and job satisfaction.

In recent years, researchers have examined how workers engage with Information Systems (IS) impacting JC (i.e., information systems-related JC, also known as Digital Job Crafting – hereafter DJC). Specifically, scholars have studied how employees actively make adaptations to effectively integrate IS innovations, often reshaping work practices. These studies have revealed that proactively embracing IS allows employees to shape their jobs, preserving flexibility in their work and discovering innovative approaches to task completion.

Analyzing the interplay between the digital transformation and JC becomes notably complex with the recent surge in the adoption of Generative AI tools, such as ChatGPT (Chat Generative Pretrained Transformer) and AutoGPT (Auto Generative Pretrained Transformer), in work and personal environments. These intelligent agents are capable of performing activities that are traditionally considered human intelligent tasks. With the significant impact stemming from the integration of AI-based tools, particularly

Generative AI tools, into work practices, numerous scholars have shown enthusiasm for their adoption [12, 15, 30], while others have voiced substantial challenges [1, 27].

This paper aims to contribute to this growing literature by shedding light on the role and impact of Artificial Intelligence (AI), specifically Generative AI, on work practices and JC. What emerges from this study is that the nature of the organizational impact of AI and Generative AI technologies goes beyond the traditional IT-enabled increased productivity. These AI-based tools have the potential to influence workers, affecting their learning processes and JC activities and enhancing their sense of control. From this perspective, it becomes evident that existing models for interpreting the phenomenon of DJC are somewhat lacking in specificity. Consequently, we advocate for the introduction of a theoretical framework that can effectively encompass the influence of these tools on JC. Through this integrated model, we aim to facilitate and support future research endeavors in this domain.

2 Literature Review

2.1 Job Crafting

Employees may be motivated by either proactive or reactive factors when engaging in job design or re-design activities and behavior. Reactive JC aims to adapt to work-related challenges such as disruptive changes, heavy workloads, or increased stress. In contrast, proactive JC is orientated towards achieving positive outcomes such as enhanced performance, personal growth, or finding meaning in one's work.

JC is fundamentally powered by employees' self-driven, informal, and proactive efforts to customize their work activities and perspectives according to their individual preferences. The adoption of digital technologies, via top-down JC, occurs through company policy. Companies often implement technological innovations to enhance employee work processes, recognizing that technological maturity can impact an organization's competitive advantage [11]. Unlike conventional top-down approaches, JC instigates change from the worker.

As highlighted by Buonocore et al. [7], the modification of job content is not exclusively within the realm of managers, as traditionally portrayed in the literature. The organizational perspective which separates task definition from the individual performing them is increasingly considered outdated. Therefore, this study focuses on the bottom-up perspective of adopting digital technologies and JC. Emphasizing this perspective over the organizational viewpoint is crucial, considering that JC is inherently a proactive behavior of employees. It's noteworthy that Wrzesniewski and Dutton [32] introduced the concept of JC to encapsulate "the actions employees take to shape and redefine their work". The same study also proposed that the motivation for crafting one's work stems primarily from individual and unmet needs, such as the need for control, positive self-image, and connection with others. Furthermore, a study involving 253 workers revealed that task, relational, and cognitive forms of JC were linked to the fulfillment of intrinsic needs for autonomy, competence, and relationships at work [26].

2.2 Digital Job Crafting

Two primary theories concerning DJC have been proposed by Wrzesniewski and Dutton [32], and Tims et al. [28, 29]. The former model posits that employees can enhance the meaning of their work by reviewing their work identities through three forms of crafting: task crafting (altering the nature, scope, or quantity of work tasks), relational crafting (adjusting relational aspects of work such as the quality or quantity of interactions with colleagues), and cognitive crafting (modifying perceptions related to work). The latter model defines JC as “*the changes that employees can make to balance their job demands and labor resources with their personal skills and needs*” [28: p. 174]. In this regard, Tims et al. [28] identified four dimensions of JC in their theoretical model: improving structural labor resources, increasing social labor resources, increasing demanding labor demands, and reducing hindering labor demands.

Zhang and Parker [33] offer a three-level hierarchical structure of JC, amalgamating the two reference models. With this integrated hierarchical framework, researchers can examine antecedents and outcomes from both perspectives.

The widespread automation potential of most jobs, facilitated by the introduction of digital technologies, has highlighted a gap in the existing literature regarding the exploration of digital technologies’ impact on JC. Digital technologies can support crafters in terms of job content, tasks, and attributes. Consequently, while the adoption of digital technologies enhances workers’ tasks and performance, it also emphasizes the enduring importance of human factors [34].

2.2.1 DJC and workers

Some scholars have observed a positive impact between the quality of information technology on work-life balance [4, 34], a factor intricately linked with worker well-being. Saha and Iqbal [25] further highlight the utility of digital technologies in enhancing task performance while cautioning about their impact on well-being and work engagement. They conducted an experimental study focusing on automatic time scheduling for work using the Time Focus feature on Outlook calendars, which revealed that participants experienced improved well-being, including heightened arousal, relaxation, and satisfaction, along with reduced feelings of anger, frustration, fatigue, and stress [25]. In alignment with the crafting categories delineated by Wrzesniewski and Dutton [32], the aspect of workplace well-being is primarily associated with environmental crafting.

Another dimension impacted by the integration of technologies into work practices is knowledge sharing (KS). Olan et al. [21] assert that simply implementing technologies is insufficient to enhance performance. Therefore, it becomes imperative to highlight the theme of KS in conjunction with digital technologies, as the latter serve as significant facilitators of KS activities within an organization [21]. In line with the crafting categories delineated by Wrzesniewski and Dutton [32], KS could primarily be associated with relational crafting.

The integration of technologies into workers’ activities frequently brings about a shifting context. Therefore, cognitive JC emerges as an innovative strategy advocated

by workers to navigate the perception of a challenging and evolving environment [23, 24]. Cognitive JC serves as a crucial individual tactic for coping with adverse circumstances, aiding individuals in discerning factors that may prompt employees to actively seek changes in their roles amid conditions of significant and dynamic job insecurity [7].

2.3 Impact of AI and Generative AI on JC

The interaction between the digital transformation phenomenon and JC becomes increasingly complex to analyze. However, it introduces an intriguing dimension when considering the integration of technologies like ChatGPT, a digital tool classified under Generative AI. An illustration of the profound impact of this technological innovation on employment is AutoGPT, an intelligent agent capable of receiving tasks in natural language, breaking them down into simpler sub-tasks, and executing them automatically using the Internet and other available tools in an iterative manner. It utilizes the GPT-3.5 and GPT-4 APIs, making it one of the pioneering applications to utilize GPT-4 for autonomous task execution. In essence, these technologies belong to a generation capable of performing tasks traditionally assigned to human workers. The dynamic nature of these systems distinguishes them from previous generations of intelligent systems [22].

In light of the substantial impact brought about by the introduction of AI, particularly Generative AI tools, on work practices, the literature reflects varying positions. Through an updated review of the literature, one can discern authors' reactions ranging from enthusiasm to apprehension regarding the integration of these new tools into the work context, while the theoretical foundation of the phenomenon of DJC remains unchanged.

As AI-based tools become increasingly prevalent in working environments, employees are finding themselves compelled to adapt their work methods accordingly. The influence of AI extends beyond societal impact, affecting the methods and characteristics of individual employees' work, thereby necessitating a reconfiguration of their roles. While AI is fundamentally altering the landscape of employment, it is evident that despite its formidable capabilities, it cannot entirely substitute human functions. Some scholars (e.g., [12, 16]) suggest that AI will displace numerous routine and manual jobs. However, this perspective faces several challenges. The assumption that professional activities are non-routine and require high-level skills is blurred, as a significant portion of professional work involves routine tasks that are susceptible to automation by AI. Additionally, many entry-level and manual jobs are not strictly routine and are thus difficult to codify [2, 3, 14]. Based on Moravec's paradox, it is possible to suggest that some jobs are uniquely 'immune': tasks requiring high-level reasoning demand minimal computation, while low-level sensorimotor skills necessitate significant computational resources [13]. Consequently, certain skills inherently human are challenging to replicate with computational power, making it less likely for new technologies to replace jobs in lower-skill occupations [15].

While there exists an optimistic outlook regarding the integration of AI into work activities, a study shedding light on negative perspectives associated with the

restructuring of work in the AI era is presented by Frey and Osborne [35], who project that 47% of all jobs in the U.S. are at high risk of being replaced by technology within two decades. It's noteworthy how these negative views are linked to various variables, including worker integrity and well-being. JC can serve as a framework to explore adaptive responses to this challenge through proactive behaviors [1].

Even in the context of advanced technologies like Generative AI, the dichotomy between positive and negative impacts fades in light of overwhelming enthusiasm. It's unsurprising that the introduction of ChatGPT is likened to a "Cambrian Explosion" [27], describing how the tool sparked a surge of experimentation and innovation, resulting in a plethora of creative ideas for its application [9].

2.4 Impact of AI and Generative AI on Crafters

The impact of technology, particularly AI, including Generative AI, extends to various aspects such as KS, feedback speed, collective intelligence, and workplace well-being. When examining these variables in the context of AI, literature emphasizes the impact on certain aspects of job crafters more than others.

For instance, regarding KS, Olan et al. [21] assert that AI-based technologies can enhance performance by providing resources for integrating existing or new knowledge. They advocate for the creation of systems capable of integrating AI tools and facilitating KS.

While individuals may capitalize on opportunities associated with KS through AI tools, they could also experience career advancements and enhanced workplace well-being [30]. Xu et al. [30] discovered through a survey of 268 employees that the perception of AI opportunities is positively correlated with employees' work well-being.

Furthermore, AI, being a digital technology, impacts the quality of work, particularly in terms of task execution speed. AI utilization influences the pace of work activities, affecting what is termed as "setting the rhythm" [36]. This notion can be likened to "persistence in execution" as described by Brynjolfsson et al. [8], denoting a type of persistence aiding workers in performing tasks swiftly and consistently. It is argued that workers with lower persistence in execution demonstrate reduced speed and quality in task execution.

2.4.1 Sense of Control

The literature highlights that Generative AI tools exert a consistent impact on specific facets of JC. Notably, the notions of control and ongoing crafting emerge prominently. Concerning control, Afiouni and Pinsonneault [1] introduce the concept of "human-in-control" — the perception of one's capability to achieve desired work outcomes in an AI and Generative AI-infused work environment. They note that this aspect has received limited attention in the literature but necessitates particular scrutiny with the advent of AI-based tools. Adapting work designs to reestablish a sense of control becomes crucial, especially in the realm of AI systems, given the inherent features of this technology. The authors argue that control remains pivotal in this new landscape, as individuals retain responsibility for their work actions and decisions. This assertion

finds support in the fact that AI learning is tailored to comprehend data content but remains oblivious to underlying causality or rationale [5]. Particularly with the introduction of new LLM systems like ChatGPT, a disparity emerges between the amplified need for control accentuated by responsibility and the perceived control disrupted by reliance on the tool. In essence, human-in-control embodies the perception of control over work outcomes, encompassing both automated and non-automated tasks, as well as other work elements [1].

2.4.2 Knowledge Sharing and Continuous Crafting

JC extends beyond individual efforts to encompass team dynamics, where collaboration among members plays a pivotal role in customizing work processes and boundaries to achieve shared objectives [17]. Leana et al. [17] conducted a study exploring JC at the team level, revealing its coordination among childcare educators and assistants. It was observed that individual and collaborative JC differed in nature and had distinct determinants. Subsequent research by Tims et al. [28, 29] linked collaborative JC positively to team performance through enhanced teamwork engagement. Even in settings with limited autonomy, opportunities for collaborative JC persist, as evidenced by findings from McClelland et al. [20], who studied call center teams with low work discretion. They found that collaborative crafting positively correlated with team efficacy, control, and interdependence. In collectivist cultures, where collective interests prevail, individual JC may require more consideration of its impact on others, yet collaborative JC remains prevalent due to its alignment with shared goals [18].

Generative AI profoundly influences KS among crafters as evidenced in some studies [e.g., 8]. It was observed that the AI model facilitates the dissemination of tacit knowledge from experienced workers to newcomers, reducing managerial interventions, and bolstering employee retention. However, this phenomenon may deter experienced workers from sharing information to avoid being surpassed by less experienced colleagues who adhere to AI suggestions [26].

Despite the potential negative effects on certain workers, Generative AI tools can foster continuous updating of job activities. Tools like ChatGPT stimulate ongoing refinement through their novelty, evolving capabilities, and generation of new outputs.

3 Socio-Technical Systems (STS) and JC

Ravarini et al. [34] emphasize the potential for a more comprehensive understanding of the phenomenon of DJC through the application of the Socio-Technical Systems (STS) perspective [6, 10]. STS offers the capability to comprehend both the technical and social dimensions of the phenomenon, thereby shedding light on the influence of digital technologies on JC. The study highlights a close relationship between the STS model and well-established models, such as Wrzesniewski and Dutton [32] and Zhang and Parker [33].

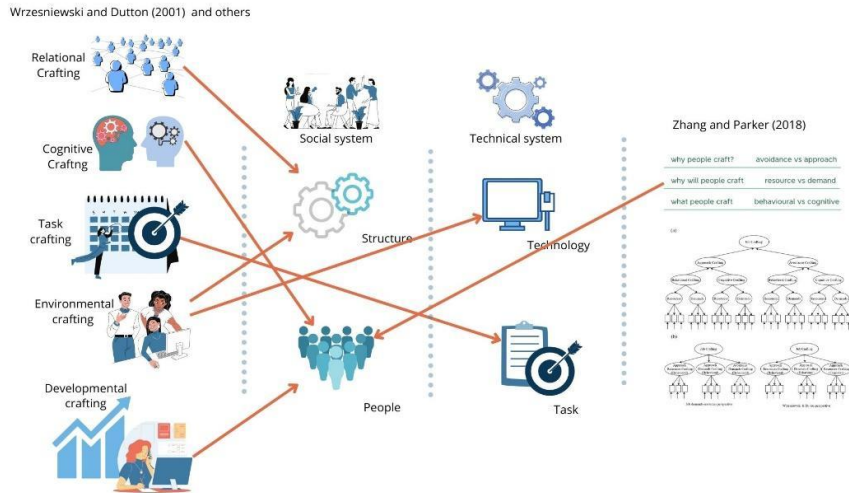


Fig. 1. JC and the STS framework [34]

It's important to highlight that the development of the theoretical model (Figure 1) considers digital technologies in a broad sense, and their impact on various aspects of JC. Specifically, digital technologies can influence facets such as KS, collective intelligence, feedback speed, and workplace well-being. Thus, within the framework proposed by Wrzesniewski and Dutton [32], these technologies affect different types of crafting: they impact relational crafting through KS, cognitive crafting through collective intelligence, task crafting through feedback speed, and environmental crafting through workplace well-being.

Considering the specific influence of technologies like AI and Generative AI on novel aspects of JC, it becomes evident that these categories pose challenges in aligning with the crafting types defined by the Wrzesniewski and Dutton model [32]. Hence, there arises a need to further develop a model that integrates this discussion to better elucidate the phenomenon of the impact on DJC, particularly concerning the adoption and utilization of Generative AI tools: one introduced by Laenen [37] for continuous crafting and [1] for the theme of sense of control.

Laenen [37] presents a study aimed at facilitating the continuous and autonomous creation of work, even in domestic settings, through the development of an application named Job Crafting Journey. This application, grounded in the Labour Demand Resource Model (JD-R) [38] and the Work Home Resource Model [39], assists individuals in their JC endeavours. Through an empirical survey, Laenen [37] identifies various themes, predominantly focusing on continuous work creation. Notably, this theme resonates with the concept of autonomous work creation and application functionalities.

Continuous JC entails factors enabling participants to seamlessly integrate crafting into their daily routines as an ongoing process. It encompasses a continuous cycle of action-reflection, a natural alignment between demands and resources, and objectives, along with seamless integration into workflow [37]. The interrelationship among these components is illustrated in Figure 2.

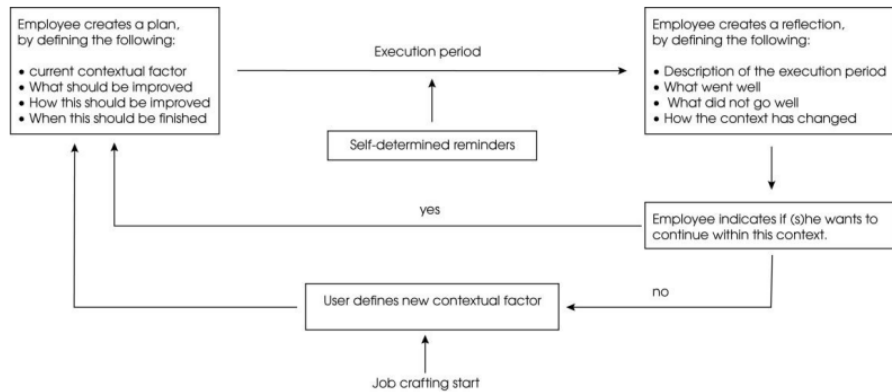


Fig. 2. The autonomous and continuous JC process [36]

In the context of the model proposed by Ravarini et al. [34], Laenen's model [37] serves as an extension, particularly delving into the task and people components of the STS framework. The process outlined in Figure 2 can be viewed as a typical procedure for defining and sharing tasks with any Generative AI tool. Notably, despite the interaction with Generative AI tools, the process maintains a human-centric approach, highlighting the centrality of human involvement. This alignment is reinforced by Afiouni & Pinsonneault [1], who assert that humans retain responsibility for process outputs, regardless of machine-generated outputs.

Afiouni & Pinsonneault [1] present a theoretical framework delineating the cascading effects of task changes on skills, relationships, and ultimately, work cognition, rooted in JC theory. As mentioned earlier, they introduce the concept of human-in-control, reflecting one's perception of their ability to achieve desired work outcomes within an AI-infused work environment, as a focal point of the JC process. The theme of control has garnered significant attention, particularly amid the widespread adoption of AI systems, highlighting the centrality of human responsibility for generated outputs. With AI integration into work processes, a perceptible gap emerges between the heightened need for control driven by responsibility and the diminished perceived control due to delegation to AI.

Motivated by the imperative to restore a sense of control, employees engage in work redesign endeavors, aiming to regain a perception of human-in-control. A ripple effect ensues from the redistribution of tasks between humans and AI, as posited by Afiouni & Pinsonneault [1]. The disruption to employees' sense of control prompts efforts to reconfigure tasks, subsequently impacting the requisite skill set. Task and competency modifications ripple into relational dynamics, either bolstering or weakening certain relationships, thus delineating relational crafting. Subsequently, individuals gain clarity on their job roles, culminating in cognitive crafting. As individuals progress through crafting stages, their sense of control evolves accordingly.

The model emphasizes trust in human-AI relationships, primary and secondary perceptions of control, and attitudes toward technology, particularly AI. Drawing from the framework of Wrzesniewski and Dutton [32], the model categorizes crafting into task,

skill, relational, and cognitive realms, associating them with the theme of control. Task crafting is further delineated into hybrid and human activities, with distinctions between critical and non-critical tasks based on trust assessments and delegation decisions. Skill crafting emphasizes variety and skill utilization in fostering a sense of control and well-designed work. Relational crafting encompasses empowerment and network strengthening to navigate AI-related control dynamics. Lastly, cognitive crafting reshapes perceptions of work boundaries and overall work perception, offering autonomy and perspective shifts.

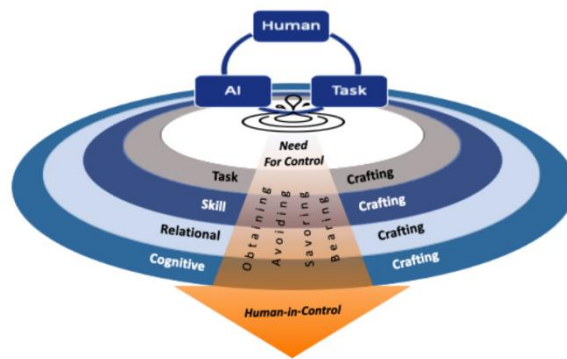


Fig. 3. From the need for control to human-in-control [1]

Afiouni & Pinsonneault [1] distinguish between two forms of control attempts: primary control, achieved during the initial iteration of the model, and secondary control, attained in subsequent iterations. Alongside the anticipated shifts between primary and secondary control, trust undergoes changes as well. As individual workers adopt diverse JC strategies, their encounters with AI systems vary, influencing their confidence in the technology. Repetitive errors in AI-generated results may erode trust, while successful outcomes could enhance trust, impacting others' perceptions of the technology. This dynamic trust associated with a worker directly influences task delegation, including assigning tasks to AI. Consequently, the evolving perception of control over time not only affects but is also influenced by crafting activities.

In the context of the model presented by Ravarini et al. [34], the framework proposed by Afiouni & Pinsonneault [1] can be viewed as an elaboration of the Wrzesniewski and Dutton [32] model and, consequently, all the components of the STS framework [34]. Thus, it represents an examination that specifically considers the element of control, a variable profoundly affected by the integration of AI into JC practices. Figure 4 illustrates the refined model.

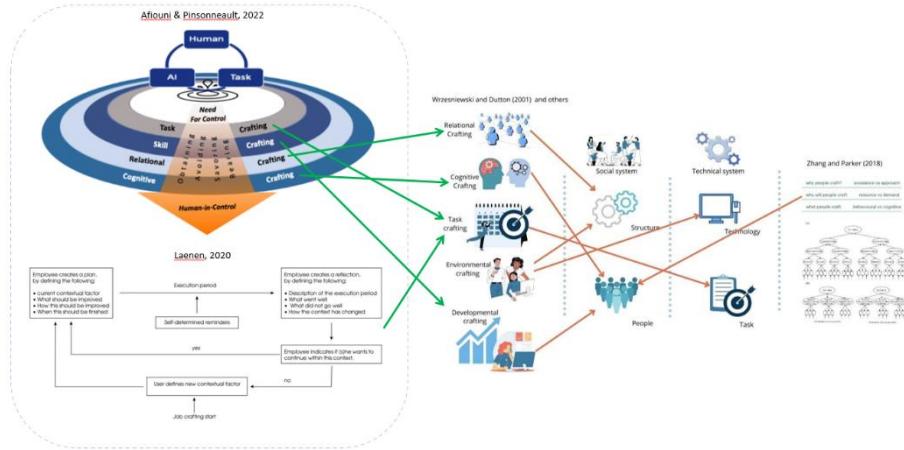


Fig. 4. DJC and the influence of AI/Generative AI

4 Conclusion and Future Research

The review shows that the impact of AI, particularly Generative AI tools, on JC, appears to be different from other digital technologies. This may be due to the nature and unique characteristics of the technology itself, which not only impacts performance but also the characteristics of the crafter.

Traditionally highlighted characteristics such as KS, cognitive crafting, and well-being have emerged. However, the adoption of tools such as ChatGPT or AutoGPT highlights the importance of continuous crafting and the sense of control, as evidenced in the literature. Ravarini et al. [34] developed an integrated model to elucidate the phenomenon of DJC, incorporating the impact of digital technologies on JC. Considering the distinctiveness of the new AI and Generative AI tools and the consequential impact on the JC, this study contributes by developing a conceptual model that integrates and considers further impacts on the crafter identified in the literature: Afiouni & Pinsonneault [1] and Laenen [37].

Therefore, this study aims to elucidate the role of AI, particularly Generative AI, in enhancing work practices. The development of the proposed model seeks to offer a useful framework for comprehending and interpreting the phenomenon of JC, considering the introduction of AI tools within work practices.

The framework developed serves as both a support and foundation for further research endeavours. Subsequent analyses could delve deeper into the phenomenon by exploring other theories and considering different theoretical frameworks to examine the impact of AI on JC.

Disclosure of Interests. The authors have no competing interests.

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