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The Impact of Office Innovation in the Physical Workplace on Employee and Organizational Outcomes

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ABSTRACT

The physical environment through office innovation influences the success of the employees and organization at the workplace. Office innovation plays a crucial role in shaping a workspace that fosters productivity, collaboration, and overall well-being. A well-designed physical workplace tailored to the specific needs of employees can enhance both individual performance and organizational outcomes. Organizations have the responsibility to create environments that not only support daily tasks but also encourage creativity, communication, and engagement. By investing in innovative office designs - such as open layouts, flexible workspaces, ergonomic furniture, and integrated technology - companies can foster a culture of collaboration and innovation. The paper analyses analytical reviews of the existing literature to explore the relationship between office innovation and its impact on employees and organizational outcomes. Content analysis of relevant studies reveals that comfortable and well-designed physical environments lead to improved employee satisfaction, engagement and retention. Additionally, a conducive workspace promotes better communication, creativity, and teamwork, all of which contribute to higher levels of organizational performance. The findings highlight the importance of creating a healthy, innovative work environment that supports employees in their tasks, ultimately benefiting the organization by driving success and long-term sustainability.

1. Introduction

A comfortable physical environment is essential for both employees and the organization [1]. It refers to the office innovation of office design for a physical work environment that enhances employee satisfaction and organizational success. Office innovation such as open-plan office requires careful and thoughtful design, as it significantly impacts the physical work environment. Moreover, a well-designed office supports an environment that contributes to a physical healthy working environment. The rapid advancement of technology and the diversity of work styles are driving

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significant changes and reinvention in workplace innovation [2]. Additionally, modern work environments must compete with various physical and virtual opportunities. To attract employees and reinforce their values, workplaces are now compelled to adopt novel and imaginative approaches. Employees desire active involvement in the engagement of the organization and are eager to contribute in various ways. It makes the employees feel more motivated and actively participating in organization activities is a positive environment.

The design of office spaces has undergone significant transformation to accommodate various requirements, including collaboration, privacy, interaction, and autonomy [3]. These alterations are intended to foster a more productive and efficient work environment. Furthermore, office innovation for office design is evolving outcomes of employees' health and performance towards the organization [1]. In an open-plan office environment, supervisory staff can oversee their employees directly from their private offices. This layout resembles the dynamics of a factory floor, where employees are overseen by the supervisor. It also raises concerns about privacy and the potential for constant scrutiny, which affects employee morale and productivity. Moreover, an open-plan office is a type of workspace characterized by minimal barriers between workstations, as it lacks traditional partitions like walls, fences, or hedges [4]. This is supported by Park [5] that the open-plan offices have several challenges such as a lack of acoustic and visual privacy, excessive social interactions, smaller workstations, and frequent interruptions from unwanted sources of noise. In addition, a shared space can affect the outcomes such as employees' cognitive as key disadvantages in open-plan offices. The distractions caused by unwanted noise can hinder employees' concentration, lead to errors, increase fatigue and waste time ultimately affecting work quality.

According to Guler and Halime [6] insufficient visual privacy caused by interaction, noise or distractions negatively affects employees' perceptions of the workplace environment. This lack of visual privacy can undermine the primary advantage of promoting employee interaction in the office innovation. This paper examines the impact of office innovation in open-plan offices on employee privacy and concentration within the organization. It identifies a gap in the literature regarding the effects of visual privacy on the physical environment in open-plan offices. Additionally, a gap for this paper is to be examining how different configurations of open-plan spaces influence both privacy and collaboration, as well as the long-term effects on employees and organizations. Exploring these aspects provides a more comprehensive understanding of the implications of office innovation on employee experiences.

2. Literature Revi

2.1 Office Innovation

Previous research conducted by Rotimi *et al.*, [32] in Auckland, New Zealand found that workplace design includes natural elements such as interior office space influence employees' health and well-being. Another research by Wadu *et al.*, [33] conducted research in Real Estate Consultancy Firm, Kowloon, Hong Kong and found that activity-based work (ABW) from the office layout significantly influences employee productivity. Overcrowding and distraction from sources of noise is detected to affect employees in ABW working environment. Additionally [34] is agreed that the sources of noise from the open-plan offices at French Companies, France, as evident in the unwanted sound of the conversation from the people are an annoyance. Moreover, the design of open-plan offices, such as the high density of workstations and the absence of personal enclosures can worsen problems related to noise and distractions. Research by Shafaghat *et al.*, [35] conducted in Johor Bahru, Malaysia, highlighted that office innovation can enhance positive aspects such as efficient workflow, performance, flexible design, and cost efficiency, all of which contribute to improved staff

productivity and satisfaction. However, there are also negative aspects to consider, including auditory distractions, decreased work feedback, job dissatisfaction, illness, and increased stress.

Studies conducted in Dejen Aviation (DAVI), Ethiopia [36], Higher Education (HEI), Karachi, Pakistan [37] and PT, Bank Negar, Wilayah Manado, Indonesia [38] have stated that physical workplace environments such as lighting, noise, air conditioning can increase satisfaction, performance and productivity at the workplace. Poor conditions in these areas can lead to decreased performance and higher turnover intention while optimal conditions enhance productivity and reduce the likelihood of employees leaving.

Brewing Firms, Anambra State, Nigeria [39] and Engineering Company, Jordan [22] emphasize that It emphasized that workplaces designed with ergonomics in mind boost employee performance by minimizing risks and mistakes. The equipment and machinery are important to fit workers' needs, prioritizing health and safety to enhance overall productivity. The highest factors affecting employees' performance from the discomfort of used furniture have a highly negative impact on employees. Creating a conducive work environment to increase motivation and performance.

Another primary factor that effected physical environment that research conduct in government agency in Malaysia [6] is lighting. Proper lighting is identified as the most influential factor, enhancing employee performance by improving comfort and reducing strain. A well-designed physical environment boosts employee satisfaction, commitment, productivity, well-being and employees' performance.

2.2 Open-plan Offices

Eberhard and Wolfgang Schnelle are two furniture manufacturers who initiated the idea for open-plan offices [9]. This idea came from Germany which finally extended to the United States in 1960. The open-plan offices have identified both positive and negative impacts associated with the design. On the positive side the open-plan offices enhance employee communication and interaction [9]. Conversely, the open-plan offices design has contributed to increased noise, distractions, perceived crowding and a reduction in privacy. The primary objective of open-plan office design is to establish workspaces that are outlined by furniture or partitions instead of conventional rooms or walls [7]. The partitions are frequently employed to divide extensive open-plan offices into smaller, more manageable workspaces. Moreover, the open-plan offices are characterized by individual workspaces situated within a large, open area. These designated working areas have indicated that these integrated workspaces present both benefits and challenges concerning employees' perceptions of the working environment. Open-plan offices grew even more popular as a way to save on operational costs [8]. It is designed to maximize the use of available space, fostering a collaborative environment that encourages teamwork and interaction among employees. By removing physical barriers, these layouts promote open communication and the sharing of ideas, which can lead to increased creativity and productivity. Additionally, open-plan design can enhance relationships among team members, creating a more cohesive workplace culture.

On the other hand, open-plan offices negatively affect employees due to several factors, such as a lack of visual and acoustic privacy, noise sources, shared workstations, increased cognitive workload, dissatisfaction with workspaces and decreased work performance [3,17]. Furthermore, the open-plan office design utilizes modular furniture and movable partitions to partially separate employees from other employees who share the same space. This approach is to balance openness with a degree of individual privacy. This contrasts with traditional offices, where the full-height internal walls and doors provide separate, private office spaces. Furthermore, working in an open-plan office involves spending long hours with a various group of people in the workplace and desks

facing each other are not separated by any barriers. In this office design employees can hear conversations and the activities which leads to a lack of visual privacy and confidentiality [9]. These conditions cause distraction, increase stress levels, cause nervousness, and generally have a negative impact on employees' concentration at work. This is supported by Ayoko *et al.*, [10] open-plan settings experienced increases in low task performance, low satisfaction levels, increased social withdrawal and higher turnover intention. Additionally, in open-plan office design, there are very few designated quiet spaces such as private meeting rooms and discussion rooms. The absence of a meeting room gives a challenge to employees that impairs productivity, for tasks that require confidentiality and deep concentration.

2.3 The Importance of Office Innovation

Office design plays a crucial role in determining the most appropriate layouts for organizations, ensuring alignment with employee's requirements [11,17]. It has a relationship between well-being and working the workplace. Fayyad *et al.* [17] mentioned that office interior design can enhance the human experience by improving health, safety, and welfare. A comprehensive understanding of an organization's nature, work practices, office culture, and other needs enables employers to propose the optimal combination of various space types and physical environments, fostering innovation in office interior design. It shows that interior design such as furnishing becomes important as a support for the employees in performing the tasks at the workplace. Moreover, Joroff *et al.*, [12,14], mentioned that office innovation is referring to a proper plan to avoid the negative impacts on employees and maintain a good image of the organization. This is supported by Nanayakkara *et al.*, [11,1] employees spend about eight to nine hours in the workplace become essential to support the positive environment. Moreover, Lee *et al.*, [13,15] added that an effective design of an office space contributed to the productivity, safety and health of the employees. They further explained that fostering a positive environment through innovative approaches can lead to a better future, increased value, and greater satisfaction for the organization. This is supported by Binyaseen [15], who highlights that office design plays a significant role in influencing office privacy. Furthermore, a lack of privacy can lead to distractions, which negatively impact concentration. Consequently, the physical office environment can have adverse social impacts on employee sustainability.

1.1.3 Noise Sources Reduced Personal Enclosure in Open-plan Offices

Noise is a major source of dissatisfaction in open-plan offices, significantly impacting employee comfort and the overall workplace experience [16]. Noise from the unwanted sound such as the people's conversation disrupt and negatively impacts employee's performance on tasks that require cognitive processing. This type of noise can interfere with concentration, increase cognitive load, and lead to higher levels of stress. In addition, employees can experience reducing productivity and make mistakes in tasks [18]. This is when in open-plan offices noise and disturbances caused by others' conversations or phone calls is the most comments that significant with the quite time for focus work [19]. The open-plan design office is lead to the noise from the phone calls conversation, which the conversation and disturbing others. It has happened when noise and disturbances from others' conversations or phone calls are frequently cited as significant issues during quiet, focused work. This environment can be particularly challenging for employees who require a quiet space to concentrate and perform their tasks effectively. The lack of personal enclosure and the constant background noise can significantly impact productivity and overall job satisfaction.

Contrary to the common belief that communication increases with physical proximity, it is found that open-plan offices can actually reduce the frequency of face-to-face interactions [20]. Additionally, open-plan offices designed to facilitate employee interactions do not necessarily lead

to improved communication [21,22]. Furthermore, employee interaction fails to balance the negative impacts of noise and privacy issues, and increased distractions indirectly reduce collaboration in open-plan offices [23,24]. Consequently, office innovations that prioritize open-plan layouts are not suitable for employees who require privacy and concentration to perform tasks effectively.

2.4 Office Transition and Its Impacts

Innovations in office layout significantly influence various outcomes, employee health, and overall performance for both individuals and the organization [23]. In the context of open-plan offices, the office environment is identified as negatively impacting both employees and the organization. This refers to a significant decline in workspace satisfaction, employees' increases in distraction and loss of privacy, and a decrease in performance in open-plan offices. The features of the open-place office do not fit employees with the workspace when the employees often find another place for discussion such as outside the office to avoid interruptions. Moreover, office innovation can lead to feelings of loss of privacy and personal control over the workspace [25]. In modern offices, open-plan layouts have become popular, eliminating partitions to create open workspaces. Consequently, this design can make employees feel uncomfortable and consistently exposed, as they are always visible to others.

On the other hand, the features of open-plan offices lead to fatigue, headaches and difficulties in concentration [25,26]. This indicates that as the density of an environment increases, the likelihood of collaboration decreases. Furthermore, density-populated work environments impact employees' ability to collaborate effectively. The constant noise makes it difficult for individuals to engage in meaningful conversations or collaborative work. As a result, employees often experience reduced productivity and delays in task completion. To maintain focus, employees need to filter out background noises that disrupt their concentration.

2.5 Other Factors in Office Innovation

2.5.1 Concept of Office Design

According to Gjerland *et al.*, [27], the three concepts of office innovation in design include: first, a typical layout plan for the physical office workplace; second, the seating arrangement of employees; and third, the overall location of the office.

A typical layout plan for the physical office workplace encompasses the overall design and arrangement of the office space. It includes how different areas are organized, such as workstations, meeting rooms, and shared spaces. A well-thought-out layout can enhance workflow, facilitate communication, and improve employee collaboration. A benefit an effective layout is place collaborative spaces near workstations to encourage teamwork while also providing quiet areas for focused work. The design of an office layout is a critical component of an office concept, as it not only defines the physical arrangement of workspaces but also influences how employees interact and utilize the space.

The seating arrangement of employees involves how employees are positioned within the office. This can range from traditional cubicles to open-plan seating or even flexible arrangements that allow for movement and change. There are several types of setting arrangement, including private cell offices that accommodate one person per room. Shared offices can host two to three individuals per room, while open-plan offices are designed to accommodate four or more people, with some layouts capable of housing even larger groups. In order to tailor the work environment with the diversity of office design, the office innovation the organization is allowed to meet various needs and

preferences, ultimately fostering collaboration and enhancing productivity among employees. These types of offices are defined by how many employees share each room, and the rules for using them are usually informal or not clearly stated. Flexible office or activity-based office models allow employees to select seating freely to enable employees to work in any area of the office according to the tasks and personal preferences.

Overall, the location of the office needs to be accessible to enhance convenience for employees. Additionally, an office situated in a spot that maximizes natural light and offers pleasant views can significantly boost employee well-being and productivity. Large windows and open spaces allow light to flow in, creating a more inviting and energizing environment.

2.5.2 Flexible Workspaces

The flexible workspace is defined by the nature of both the organization and the employees' work [27]. It encompasses the adaptation of activities and tasks performed by employees in relation to various work practices. This flexibility in office design is contingent upon how the workspace is organized and how activities are conducted within it.

A flexible workspace within an organization refers to the strategic organization and arrangement of office space to effectively support employees' activities [27]. The design of flexible workspaces encompasses a variety of areas, including pantries, discussion rooms, meeting rooms, conference rooms, standing desks, and quiet zones. Additionally, flexible workspaces include employee workstations and lounge areas. This diverse arrangement aims to create subdivided spaces that balance the varying needs of employees in performing the tasks. Furthermore, the flexible workspace is addressed by how easily or ensures that every room is conveniently reachable to ensure flow of movement throughout the office. This design not only enhances collaboration among employees but also ensures easy access to the resources and spaces needed to perform tasks efficiently [28]. Additionally, access to natural light in the workplace is crucial for enhancing employee overall satisfaction. Designing workspaces with large windows or skylights allows abundant sunlight to enter, creating a warm and improve cognitive. Exposure to natural light can improve mood, increase energy levels, and enhance focus, which helps employees remain engaged with the tasks.

2.5.3 Ergonomic Factors for Office Innovation

Ergonomics plays a vital role in integrating employees into the physical environment, particularly within open-plan offices [29]. According to Lemma *et al.*, [30] ergonomics is the relation or interaction between people with the physical environment in which employees work. In the context of office innovation, it is essential to assess and design workspaces that involve creating layouts that facilitate movement and interaction while minimizing distractions.

Ergonomic factors in office innovation at the office workspaces such as noise that include phone conversations, ringing phones, typewriters and other activities at workspaces [31]. In order to reduce noise distraction, it is essential to incorporate acoustic damping devices and features that minimize noise. This includes using glass partitions between work areas, installing acoustic ceilings, and providing printer cabinets. These elements work together to enhance the overall work environment, promoting focus and productivity. The acoustic aspect of this environmental factor pertains to respondents' perceptions of noise, which can significantly impact an employee's ability to concentrate on their tasks.

In the workstation, the idea to include strategically placing desks to promote collaboration, ensuring adequate space for personal privacy, and incorporating adjustable furniture that

accommodates various body types and preferences. Additionally, ergonomic design encompasses the physical arrangement of workspaces, including factors such as desk height and chair design, acoustic system, lighting and temperature which are essential for supporting employee comfort during task performance.

The integration technology and ergonomic setups enhance the functionality of employees at work. Ergonomic furniture for adjustable desks allows employees to alternate between sitting and standing, promoting better posture and reducing the risk of musculoskeletal issues. Ergonomic chairs provide lumbar support and encourage proper alignment, which is vital for long hours of work. This thoughtful setup aids employees in maintaining better posture and significantly reduces the risk of strain and injury.

3. Methodology

The paper analyses analytical reviews of the existing literature to explore the relationship between office innovation and its impact on employees and organizational outcomes. The paper primarily focuses on existing data related to office design within the physical office environment emphasizing how these designs support employees' tasks and contribute to organizational success at the workplace.

The information used in this paper is derived from secondary sources, including journal articles from Google Scholar and academic research publications. The research came up with a total of thirty-one (31) most related articles in related to physical workplace environment.

3.1 Types of Outcomes

The study outcomes must be relevant to office employee workplaces and organizations. Fostering innovation in the workplace is crucial, as it significantly enhances both employee satisfaction and overall organizational performance. Creating an environment that encourages innovative thinking, employees are more likely to feel engaged and fulfilled in their roles, which in turn positively impacts the organization's success.

3.2 Types of Setting

The study setting encompasses various office concepts, ultimately focusing on one specific type: open-plan offices. This research delves into specialized studies on office innovation and its impact on both employee satisfaction and organizational outcomes.

3.3 Fishbone on Positive and Negative Impact in Open-plan Offices

The literature reviewed from sources such as Google Scholar, Elsevier, Emerald and Sage highlights both positive and negative impacts of office innovation in open-plan environments. The keywords utilized in this research include open-plan office, shared space, density and office, privacy, performance, noise in the office, employee productivity, employees' health and ergonomics. Office innovation within open-plan offices significantly influences both employee experience and organizational outcomes. As illustrated in Figure 1, these impacts can be categorized into positive and negative effects, each encompassing various sub-factors.

Positive impacts include enhanced collaboration, improved communication, and increased flexibility, which can lead to higher employee engagement and satisfaction. Conversely, negative

impacts often manifest as distractions due to noise, reduced privacy and potential health issues stemming from ergonomic deficiencies, ultimately affecting employee performance and productivity. This duality underscores the complexity of open-plan office designs, necessitating a careful balance to optimize both employee well-being and organizational effectiveness.

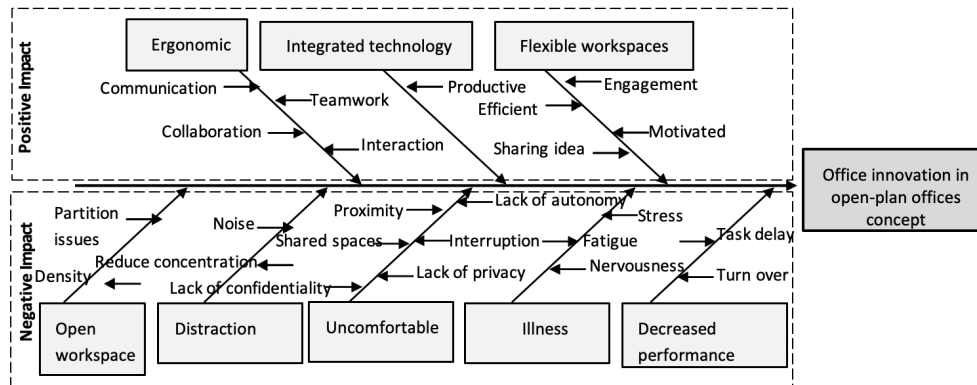


Fig. 1. Office innovation in open-plan offices concepts affecting the employees and organization

4. Result

4.1 Content Analysis in Office Innovation on Employees and Organization Outcomes

The research came up with a total of 23 most related articles on office renovation in open-plan offices. All reviewed articles have been transferred into the checklist table which resulted from Table 1. The content of the literature was analyzed to identify which office innovation impact, and the sub-factors have been focused on. Table 1 presents the content analysis on the reviewed open-plan office design's impact on employees and organization. The research provided the row 'Total' to determine the time(s) of authors for each sub-factor.

The literature indicates that the sub-factor of communication, situated within the broader category of ergonomics, has been extensively examined in relation to its positive impacts on both employees and organizational outcomes. Conversely, the sub-factor of noise, categorized under distractions, has been predominantly addressed in the context of its negative effects. Research consistently points to noise as a significant disruptor of focus and concentration, leading to decreased performance and increased stress among employees. This dual focus on communication and noise underscores the complex dynamics of open-plan office environments, where the benefits of enhanced interaction must be weighed against the challenges posed by auditory distractions.

Open-plan office designs have both positive and negative effects on the workplace in the organization. On the positive side, these designs enhance communication among employees and reduce overall office costs by minimizing the need for partitions. This layout promotes a more collaborative environment and allows for greater access to natural light.

However, open-plan offices also present several challenges. Open-plan tends to increase workplace sources of noise, leading to disturbances and distractions that can negatively impact employee concentration and performance. Additionally, the feeling of crowding and the loss of privacy are significant drawbacks associated with this design.

Privacy, which refers to the degree to which individuals can control employees' social interactions, is particularly compromised in open-plan settings. It can be categorized into three types: visual privacy, acoustic privacy, and privacy from distractions. The lack of privacy in these environments can disrupt personal conversations and contribute to a less functional workspace, ultimately reducing the required square meters per person.

Table 1
 Content analysis on office innovation

Authors	Positive Impact								Negative Impact															
	Ergonomic			Integrated Technology		Flexible Workspaces			Open Spaces			Distraction		Uncomfortable		Illness		Decrease performance						
	Communication	Collaboration	Teamwork	Interaction	Productive	Efficient	Sharing Idea	Engagement	Motivation	Partition Issue	Density	Shared Spaces	Reduce Concentration	Proximity	Noise	Lack of Confidentiality	Lack of Autonomy	Interruption	Lack of Privacy	Stress	Fatigue	Nervousness	Task Delay	Turn-over
Kim & de Dear (23)	√									√					√			√					√	√
Ayoko & Ashkanasy (10)	√									√			√	√		√			√	√				
Joroff <i>et al.</i> , (12)		√																						
Blok <i>et al.</i> , (21)		√																					√	
Morrison & Smollan (3)	√	√										√	√			√							√	
Seddigh (8)		√								√		√	√		√			√	√				√	√
Shafaghata <i>et al.</i> , (9)			√							√			√					√						√
Lemma <i>et al.</i> , (30)			√											√										
Gjerland <i>et al.</i> , (27)					√						√												√	
Forooraghi <i>et al.</i> , (14)					√											√								
Norton <i>et al.</i> , (29)	√	√				√	√				√					√		√	√	√	√	√	√	√
Park & Lee (5)														√										
Bernstein & Turban (20)	√	√																						
Haapakangas <i>et al.</i> , (24)	√				√		√							√				√	√					
Colenberg <i>et al.</i> , (17)								√						√					√	√				
Fayyad <i>et al.</i> , (18)					√			√																
Nanayakkara <i>et al.</i> , (11)		√			√				√															
Binyaseen (15)									√	√														√
Liu <i>et al.</i> , (4)										√				√										
Bodin (26)													√	√							√			
Chacon Vega <i>et al.</i> , (19)	√						√																	
Guler & Demirkan (16)		√		√										√										
Rotimi <i>et al.</i> , (1)									√	√				√										
TOTAL CITATION	7	5	3	3	5	1	3	2	2	3	5	2	2	3	11	1	4	1	4	5	5	1	6	5

In summary, while open-plan offices can foster communication and reduce costs, this design pose challenges related to noise, privacy, and overall employee efficiency. Addressing these issues is crucial for optimizing the benefits of open-plan designs.

The findings highlight the importance of creating a healthy, innovative work environment that supports employees in employees' tasks, ultimately benefiting the organization by driving success and long-term sustainability.

5. Conclusions

In conclusion, this paper emphasizes the vital importance of visual privacy in open-plan office environments. When visual privacy is insufficient, often due to noise and distractions, it can significantly impact employees' perceptions at the workplace. This undermines the primary goal of promoting interaction and collaboration among employees.

The paper highlights the need for further research to fill existing gaps in the literature regarding how visual privacy affects the physical workspace. This paper specifically emphasizes the need to explore how various layouts of open-plan spaces affect both privacy and collaboration, along with their long-term implications for employees and organizations.

Understanding these dynamics is crucial for designing work environments that not only foster collaboration but also protect employee well-being and performance. Ultimately, a balanced approach to office design can lead to more effective and satisfying workplace experience for all employees and the organization.

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