

City Park as an Adaptive Communal Place in COVID-19 Pandemic Era (Study Case: Merdeka Town Square)

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ARTICLE INFO

Article history:

Received 04-01-2025

Revised 10-06-2025

Accepted 22-07-2025

Available online 08-08-2025

E-ISSN: 2622-1640

P-ISSN: 2622-0008

How to cite:

Wulandari L D, Pratiwi E I. City Park as an Adaptive Communal Place in COVID-19 Pandemic Era (Study Case: Merdeka Town Square). International Journal of Architecture and Urbanism. 2025. 9(2):341-357.



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ABSTRACT

The covid-19 pandemic has forced people to isolate themselves at home and advised them not to leave the city. All public transportation has stopped working to avoid commuting. As a human, we require relaxation to have a calmer and clearer mind. The health protocol advised safe outdoor activities (with no air conditioning to reduce the risk of exposure and transmission of the virus. Social distancing, avoiding crowds and poorly ventilated indoor spaces can be done by doing activities in the central park (such as the town square). This town square could be an excellent decision to fulfil the need for tourism, completed by some adaptive designs to deal with this pandemic situation. Unfortunately, the government closed this facility and led some citizens to fulfil their needs by going to the mall quite often than before. People gathered into the crowd and some indoor activities, made the mall as their new preferred tourism destination. Therefore, this morphological research aims to reveal the importance of Merdeka Town Square as an adaptive communal place in the pandemic situation, using an activity approach (place-centered mapping). Through this research and some design recommendations, we hope to present an educational discussion about an adaptive communal space to the citizens and government

Keywords: adaptive, communal, covid-19, design, place

1. Introduction

All urban systems we're living inside are constantly changing as a cycle, facing different conditions and problems in some period of time. Lately, COVID-19 has been the most significant issue that affect all aspects around the world. This pandemic situation brought significant impact on our economics, education, civilizations, government, and physical (even mental health issues) due to Post-Traumatic Stress Disorder (PTSD) [1]. As a human, people need to clear and calm their minds. Moreover, people had already bored of being forced to stay at home, work from home and stay in the city. News told more and more about the virus' transmission and pandemic situations worldwide. Lock downs and new regulations had been announced to keep their citizens safe and sound, including Malang, East Java, Indonesia. The need for tourism activities had bothered people and slowly moved them into indoor tourism activities such as the malls, as a poorly ventilated indoor spaces. The mall was more crowded than before, creating new lines and new crowds inside. Meanwhile, doing activities outdoor is more recommended to reduce the risk of exposure and transmission of this contagious disease.

Merdeka Town Square is one of the well-known public spaces in Malang from time to time. It is one of two town squares located in two different heritage areas. As a public space, Merdeka Town Square is a place for social interactions, selling transactions, and other outdoor activities. This town square has become a crowded city park since new facilities were added in 2015. This square has undergone several transformations [2] and causes behavior changes in users inside. There is reciprocity between the environment and its actors as a process of human life [3] and forms setting behavior. Human factors are always essential in determining the level of success of a design, because the relationship between humans and the environment human behavior is the main element in the formation of the environment [4]. Thus, the most critical things in the process of adaptation to humans and the environment include: (1) setting the physical environment; (2) socio-cultural environment; and (3) human behaviour [5].

In 2020, the government ever closed Merdeka Town Square due to the COVID-19 situation. This was a deplorable action because City Park (such as the town square) could be a good adaptive strategy within the city. The role of cities in implementing adaptation policies is taking huge responsibility for their resilience. This is a new term used in urban planning discussions due to the increasing attention to extreme events and their consequences [6]. A city should be able to adapt to shocks and discover new opportunities, so that it can perform even better in any circumstances. Merdeka Town Square could be a new tourism destination to reduce virus transmissions and provide the need for tourism activities. This COVID-19 condition has made some changes, so we need a new adaptive design to perform even better due to post-pandemic circumstances.

This research brings out the new possibility of making the city park an adaptive communal place due to COVID-19 outdoor tourism issues. Through this research, we could determine people's need for tourism and implement new adaptive designs related to the post-pandemic situation. A behavioral study of people in Merdeka Town Square showed the importance of public space and its role in many aspects of the city, such as government policies, citizen's needs, economics, education and even health problems. Adaptive design of public space could be a strategy to improve the city's resilience due to COVID-19 shock. Thus, the global understanding of an adaptive communal space could be developed into new systems and knowledge.

2. Method

This qualitative study was conducted at Merdeka Square, a prominent public space in Malang, Indonesia, to explore how the COVID-19 pandemic influenced social behaviors and the potential for adaptive urban designs in public spaces. The research employed a place-centered mapping approach combined with in-depth interviews to understand the interactions between the physical environment, socio-cultural factors, and human behaviors within the space. Place-centered mapping was used to document the dynamics of how people used the square at different times of the day, during holidays, weekends, and regular weekdays, in order to capture variations in usage patterns. The mapping focused on permanent user groups such as street vendors, police officers, local residents, and tourists, examining how their interactions changed in response to the pandemic. Additionally, semi-structured interviews were conducted with 25 participants representing a diverse set of stakeholders, including local residents, vendors, tourists, and city planners. The interviews aimed to gain deeper insights into the users' experiences and perceptions related to their usage of public space during the pandemic, focusing on safety concerns, health protocols, and the need for adaptive design in public spaces. Observational data was collected over several months (June 2020 – August 2021) to document the changes in behavior, such as crowding patterns, adherence to health protocols, and interactions between various user groups. A review of relevant Malang City government regulations, policies related to public health and urban space management, and previous studies on pandemic response strategies was also conducted to contextualize the study. The data gathered through these methods were analyzed using thematic analysis, identifying recurring patterns and themes that linked behaviors to the physical environment and the broader social context. These findings were then used to develop adaptive design strategies aimed at improving the resilience and functionality of Merdeka Square in the post-pandemic era. The designs proposed were based on observed socio-environmental challenges and the behavior of users, ensuring that they were both context-specific and practical. However, the study acknowledges its limitations, particularly the small sample size for interviews and the focus on a single public space, which may limit the generalizability of the results. Future research

should include a broader sample and more diverse public spaces to gain a more comprehensive understanding of urban resilience in post-pandemic contexts.

3. Results and Discussion

In this section, researchers explore the dynamic and adaptive nature of Merdeka Square, focusing on how it functions as a communal space throughout the year, especially during significant events. The changing usage patterns of the square provide valuable insights into its role in the urban fabric, highlighting how it accommodates a broad range of activities and users. To better understand these shifts, the researchers begin with a detailed examination of the square during one of the most culturally significant events of the year: New Year's Eve. The analysis of this period reveals how the square evolves from a quiet, routine environment in the morning to a vibrant, socially engaging space by night, influenced by both permanent and non-permanent users. Figure 1 offers a visual representation of these transitions, divided into three distinct time frames: morning, noon to afternoon, and evening to night. Each segment demonstrates the progressive increase in crowd density and the evolving function of the space, illustrating how Merdeka Square serves not only as a public park but also as a dynamic, adaptable space for social and economic interactions.

Figure 1 provides a detailed visual representation of how Merdeka Square, a central urban park, functions as a dynamic space throughout New Year's Eve, with a clear transition in the square's usage from morning through to night. The figure is divided into three distinct time periods: (a) morning, (b) noon to afternoon, and (c) evening to night. Each time segment reveals a progressive increase in crowd density, as the square transitions from a space dominated by permanent users to a more crowded and diverse space in the evening. The morning segment (a) shows relatively low activity, with permanent users such as police officers, street vendors, and the parking attendants occupying central positions within the square. These users, though permanent, perform functional roles that contribute to the square's routine operation. Their presence sets the foundation for social interactions, which gradually intensify as the day progresses. By noon to afternoon (b), the square begins to attract non-permanent users, including shoppers, tourists, and those on their way to other activities. These individuals are often drawn by the activity already present in the square, such as the street vendors and musicians who contribute to the square's lively atmosphere. The permanent users, such as police officers and street vendors, seem to facilitate this attraction, as their presence provides a form of social anchoring, drawing crowds into the square. The square serves not only as a passive recreational space but as an active node of commerce and social interaction. In the evening to night (c), the square reaches its peak crowd density, particularly as individuals gather for New Year's Eve celebrations. Non-permanent users, who may have been initially drawn by the activities of the permanent users, now fill the space, with some returning regularly to the square during peak events. The cumulative effect of the permanent users, who provide a stabilizing presence and draw in non-permanent users, illustrates how Merdeka Square transforms into a communal hub by night. In this phase, the square fully embodies the characteristics of an adaptive public space, as it accommodates a broad spectrum of users, ranging from local workers to evening tourists and celebrants.

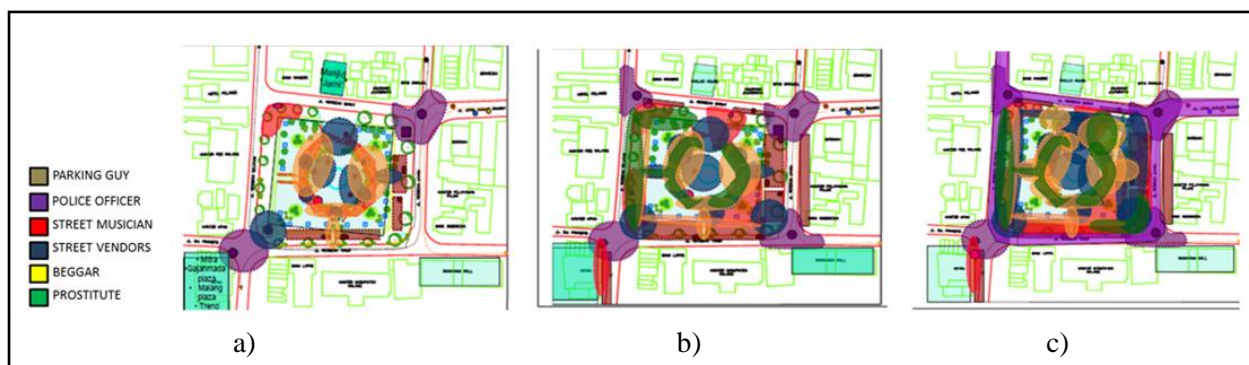


Figure 1 New Year's Eve situation of the permanent users as an attraction to the non-permanent users. From a) morning, b) noon till afternoon and c) evening to night time. These figures showed that the square was getting crowded as it was getting late

The analysis of Figure 1 is situated within the broader context of place-centered mapping conducted at different times, including national holidays, religious observances (such as Eid al-Fitr and Ramadan), and ordinary weekdays. The place-centered maps have demonstrated that the behavior of square users is influenced by the activities of permanent users, who serve as both a functional and symbolic presence within the square. Street vendors and musicians, for instance, occupy larger areas of the square and, by doing so, create zones of attraction for non-permanent users. As the crowd density increases throughout the day, it highlights how Merdeka Square acts as a public space that fosters social and economic exchanges. The figures suggest that this square is not merely a passive tourist attraction; it is a dynamic space where human behavior is shaped by both environmental factors (e.g., the square's design and facilities) and social actors (e.g., permanent users). The permanent users' presence, therefore, plays a crucial role in attracting non-permanent users and shaping the square's function as a vibrant, adaptable public space [7].

Building on the insights gained from the New Year's Eve transformation in Merdeka Square, we now turn our attention to the square's dynamic use during a major religious celebration, Eid al-Adha. The shifting patterns of use observed during this event further highlight the adaptability of Merdeka Square as a communal space. Figure 2 provides a visual depiction of how the square evolves throughout the day, shaped by the unique social and cultural demands of the celebration. This analysis demonstrates how permanent users, such as police officers and street vendors, play pivotal roles in facilitating social interactions and creating a welcoming environment for non-permanent users, while also illustrating how the square transforms to accommodate both organized events and informal social practices. The increased crowd density and the inclusion of marginalized groups, such as beggars, reflect the square's role as an inclusive space that accommodates diverse societal groups, reinforcing the square's function as an adaptable and resilient public space [8]. The analysis of Figure 2 within the context of place-centered mapping reveals important social and behavioral dynamics in Merdeka Square during Eid al-Adha, an event with significant religious and cultural meaning. The behavior of permanent users, particularly police officers and street vendors, highlights the square's adaptability to the social and cultural demands of the event. The street vendors serve as both economic actors and attractors for non-permanent users, whose arrival shifts the square's purpose from a simple passageway to a vibrant communal space. The role of police officers and their consistent presence offers a stabilizing effect that fosters a sense of trust and safety, facilitating higher levels of non-permanent use, even amid the complex dynamics of a major religious celebration. As the day transitions into evening, beggars represent another layer of Merdeka Square's transformation into an adaptive space that responds to the social dynamics of the community. Their positioning at the edges of the square during the evening reflects how public spaces like Merdeka Square often serve as a meeting point for different societal groups, some of whom may be marginalized but are still part of the social fabric of the city [9].

The increased crowd density, combined with the diverse activities of both permanent and non-permanent users, exemplifies how Merdeka Square operates as a resilient and adaptive public space. It not only serves as a hub for daily interactions and commerce but also acts as a place for cultural and religious expressions, such as those seen during Eid al-Adha. This evolving role of Merdeka Square as an adaptive communal place underscores its resilience and flexibility, which are vital in the post-pandemic era when cities are grappling with the need for safe and inclusive public spaces.

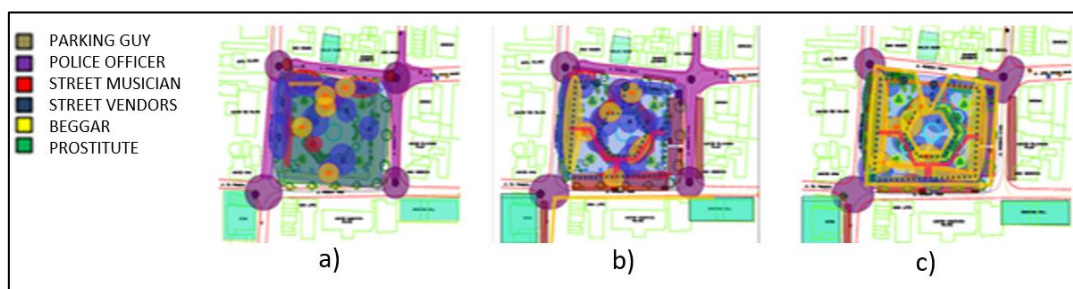


Figure 2 Eid-al Adha Eve situation of the permanent users as an attraction to the non-permanent users. From a) morning, b) noon till afternoon and c) evening to night time. Police officers were fully working in the morning and beggars in the evening

Continuing from the exploration of Merdeka Square's adaptability during Eid al-Adha, we now shift our focus to how the square transforms to accommodate the unique cultural and religious demands of Maulid Nabi Muhammad SAW. The behavior patterns observed during this celebration provide further insights into the square's resilience and flexibility as a communal space. Figure 3 illustrates how Merdeka Square evolves throughout the day, reflecting the square's ability to shift from a structured environment in the morning to a lively and densely packed area by evening. The roles of permanent users, such as police officers and street vendors, become more prominent as they facilitate crowd management, while non-permanent users, including celebrants, play a significant role in making the space dynamic and inclusive. This analysis highlights the square's adaptability to both structured events and informal activities, showcasing its importance as an inclusive space that serves diverse community needs, especially in times when public spaces must respond to both social and health challenges. The behavior patterns observed in Figure 3 provide insight into how Merdeka Square adapts to the unique requirements of Maulid Nabi celebrations. The morning period is characterized by a structured environment, dominated by police officers whose roles are defined by the need for crowd management and security. The noon to afternoon phase shows a transition into a more social and informal space, where the dynamics between permanent users, such as street vendors, and non-permanent users, such as celebrants and visitors, come to the forefront. By evening, the square has transformed into a lively and densely packed communal area, where beggars occupy the periphery, and crowds fill the space, creating a highly dynamic environment. This shift in behavior is a clear indication of the adaptive nature of Merdeka Square. The square adjusts to the needs of various groups, including those engaged in religious observance, commercial activity, and social interaction. The role of permanent users, especially the police officers and beggars, is crucial in understanding how public spaces can maintain their functionality and inclusivity, even during large public events. While police officers provide a sense of order and security, beggars highlight the social inclusivity of the square, underscoring how urban spaces serve diverse communities. The crowd dynamics observed in this analysis illustrate the resilience and social elasticity of Merdeka Square as a public space. It is a space that adapts to both organized events, such as religious observances, and informal social practices, such as street vending and begging. The square's ability to accommodate both the formal presence of security personnel and the informal, marginal activities of beggars underscores its multifunctional role in urban life [10], particularly in times when adaptive public spaces are essential for community well-being during crisis situations, such as the COVID-19 pandemic [11].

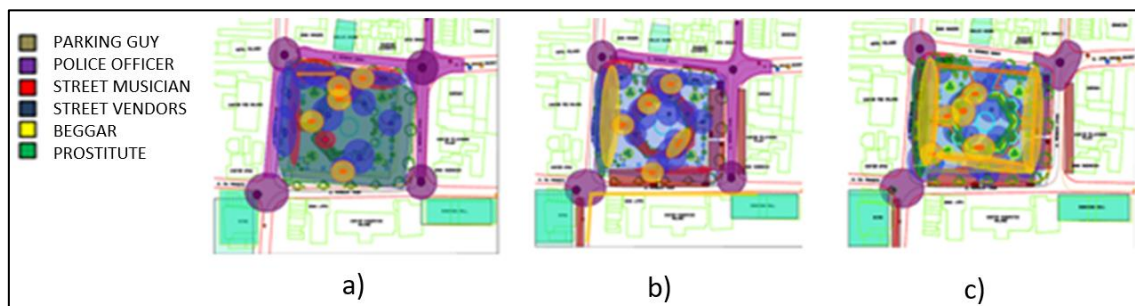


Figure 3 Maulid Nabi Muhammad SAW period from a) morning, b) noon till afternoon, and c) evening to night time. The square was fully occupied by police officers in the morning and beggars in the evening. Crowds were surrounding the square

Building upon the adaptability of Merdeka Square during religious celebrations like Maulid Nabi, we now shift to examine how the square responds to the specific demands of the City Birthday celebration. The changing behavior patterns observed in Figure 4 further emphasize the square's capacity to serve a wide array of social and functional purposes throughout the day. From morning to evening, the square transforms from a quiet, routine environment to a vibrant space for both social and commercial activities. The role of permanent users, such as street vendors and police officers, is crucial in guiding this transformation. As the square fills with a diverse crowd, the interaction between permanent and non-permanent users highlights the dynamic nature of Merdeka Square, underscoring its ability to foster both celebratory gatherings and everyday social interactions. This shift from functional space to celebratory hub illustrates the square's resilience and flexibility in responding to the needs of the community, particularly during large-scale public events. The behavior

patterns shown in Figure 4 underscore the adaptive qualities of Merdeka Square, emphasizing how public spaces can shift between different functional uses throughout the day based on the activities and needs of the users. The progression from morning to evening reflects how the square serves different social purposes at different times. In the morning, the square functions as a site for routine activities, with permanent users occupying their designated spaces. The relatively low crowd density reflects a more controlled environment, where the square is primarily a transit point for local residents. As the day moves toward noon and afternoon, the square transitions into a social and commercial hub, driven by the presence of street vendors and supported by the police officers' oversight. This period marks the beginning of the square's transformation into a celebratory space, with increasing interaction between permanent and non-permanent users. By the evening, the square has fully adapted to the festive nature of the City Birthday, drawing crowds from various social and demographic backgrounds. The adaptive nature of Merdeka Square is most apparent here, as it accommodates a range of activities, from commercial exchanges at the vendor stalls to socializing and celebrating the city's birthday. The square, in this sense, acts as both a gathering space for social interaction and a functional hub for commerce. The role of permanent users, particularly street vendors and police officers, is critical in facilitating this transformation [12]. They act as both attractors and regulators, ensuring that the square remains a safe, accessible, and engaging space for a wide range of users [13]. The street vendors, by occupying larger territories, not only contribute to the square's vibrancy but also create focal points that draw non-permanent users into the space. Meanwhile, the police officers help maintain order amidst the growing crowd, ensuring the square remains a functional and enjoyable space throughout the day.

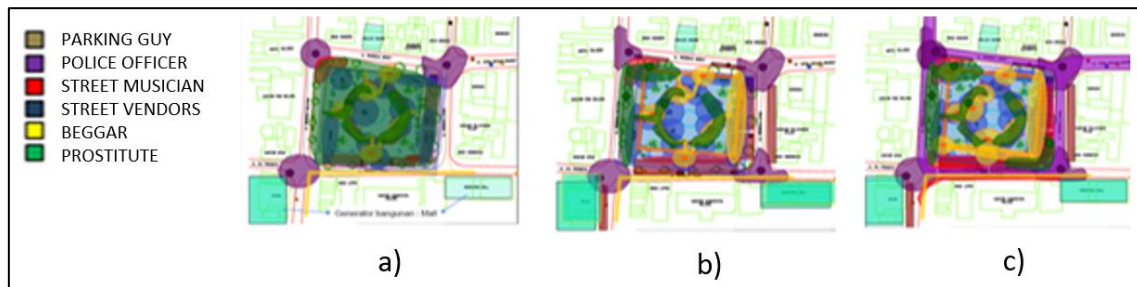


Figure 4 City Birthday situation of the permanent users as attraction to the non-permanent users. From a) morning, b) noon till afternoon and c) evening to night time. These figures showed that the square was getting crowded as it was getting late

Following the exploration of Merdeka Square's adaptability during the City Birthday celebration, we now turn our attention to how the square functions during Indonesia's Independence Day celebration, as illustrated in Figure 5. This analysis further reinforces the idea that Merdeka Square is a highly adaptive communal space, capable of adjusting its function and atmosphere based on the time of day and the nature of the event. In the morning, the square serves a preparatory role, with permanent users establishing the necessary infrastructure for the later celebration. As the day progresses, the square gradually transitions into a vibrant social and commercial hub, with the roles of vendors and police officers becoming increasingly important. By the evening, the square fully transforms into a festive, celebration-focused venue, demonstrating its capacity to shift between different functions while maintaining its core role as a community gathering space. This shift underscores the square's resilience and flexibility, essential qualities for urban public spaces, particularly in times when adaptability is key to meeting diverse user needs. The dynamics captured in Figure 5 reinforce the idea that Merdeka Square is a highly adaptive communal space, one that adjusts its function and atmosphere based on the time of day and the nature of the event. In the morning, the square's use is predominantly functional and preparatory, with permanent users at the center, establishing the necessary infrastructure for the later celebration. This phase underscores the importance of functional adaptability, where the square is prepared for the influx of non-permanent users in the later hours. As the day transitions into noon and afternoon, the square becomes increasingly socially vibrant. Permanent users such as vendors and police officers continue to play a significant role, not only as functional actors but as attractors for non-permanent users, who are drawn into the square by both the commercial activities and the sense of security provided by the police officers. This interaction between permanent and non-permanent users contributes to the square's

resilience and sociability, making it a space where various user groups can coexist and engage with one another. By evening, the square is fully transformed into a cultural and festive hub, where permanent users help anchor the crowd. Their role in maintaining order, providing goods, and ensuring safety underscores the adaptability of Merdeka Square as it shifts from a calm, functional space to a dynamic, celebration-focused venue. This transformation demonstrates how urban public spaces can accommodate a variety of uses, including commerce, leisure, and social interaction, while maintaining their core function as community spaces [14] [15].

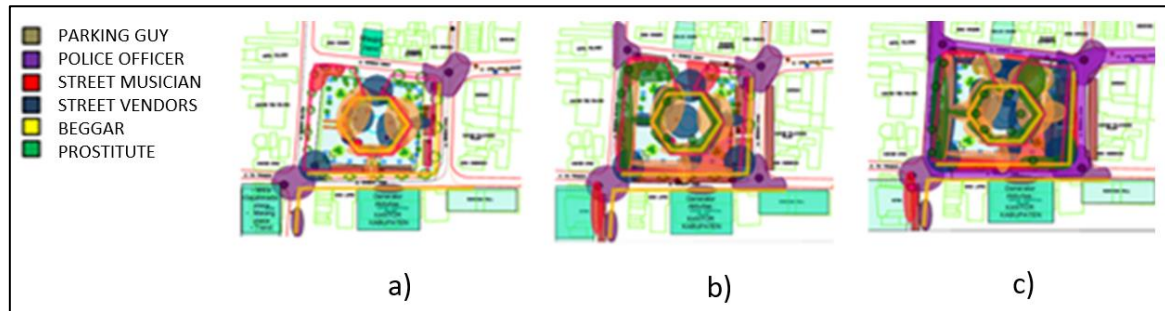


Figure 5 Independence Day of Indonesia behaviour setting from a) morning, b) noon till afternoon, and c) evening to night time. Permanent users tend to gather at the centre of the square

Building on the adaptability of Merdeka Square during secular celebrations, we now turn our attention to how the square functions during a period of religious observance, specifically the holy month of Ramadhan. The analysis of Figure 6 reveals the unique temporal dynamics of the square, where the daily rhythms are significantly altered by the fasting rituals of Ramadhan. Unlike typical public holidays, the patterns of space use during this time are influenced by religious practices, economic constraints, and environmental factors, such as daytime heat. This shift underscores Merdeka Square's resilience and capacity to adjust its function according to the specific cultural and social demands of the community. The sustained presence of permanent users, such as street musicians, exemplifies how informal actors contribute to the square's ability to transform into a space that supports both routine activities and communal rituals, highlighting the square's importance as a site of social resilience, especially in times of crisis or religious observance. The behavioral patterns exhibited in Figure 6 highlight the temporal ecology of Merdeka Square during the holy month. Unlike secular public holidays, Ramadhan reconfigures daily temporalities through fasting rituals, modifying the pattern of public space use. Street musicians, as permanent users, respond to this temporal shift by aligning their spatial occupation and activity schedules with the day's religious structure. This reveals the square's resilience and adaptive capacity not merely in its physical design but in its ability to accommodate shifting cultural and economic practices.

The place-centered mapping approach in this case shows that the square does not operate under a uniform logic of use. Instead, it responds to time-sensitive behaviors shaped by religious norms, economic constraints, and environmental factors (e.g., daytime heat). The adaptability of the musicians—evident in their sustained occupation of the square throughout the day—demonstrates that Merdeka Square acts as a temporal threshold, enabling transitions between routine activity and communal ritual. Moreover, the square's use during Ramadhan embodies the concept of informal adaptability. With limited formal programming or infrastructural adjustments, it is the presence and behavior of permanent informal actors like street musicians that give form and function to the square's adaptive identity. Their sustained activity throughout the fasting day, culminating at iftar, supports the manuscript's broader argument: that public squares serve as critical nodes of social resilience, capable of flexibly absorbing and reflecting communal needs in times of restriction [16] [17], such as a pandemic or religious fasting.

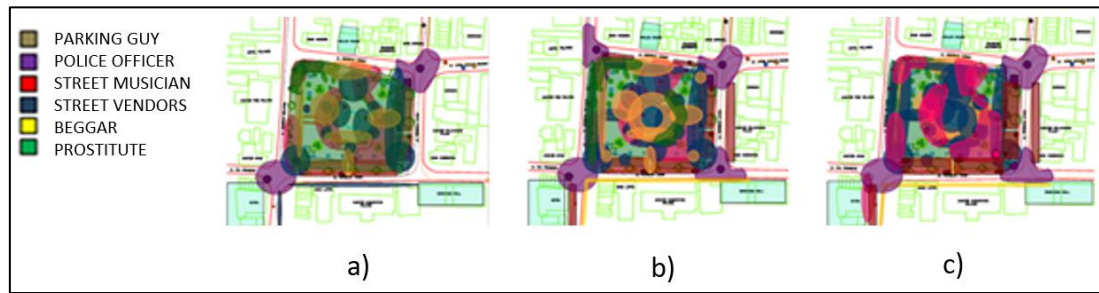


Figure 6 Ramadhan from a) morning, b) noon till afternoon and c) evening to night time. Street musicians spread inside the square from morning to evening, near iftar time

Building on the understanding of Merdeka Square's adaptability during Ramadhan, we now examine how the square transforms during the significant religious observance of Eid al-Fitr. The spatial and temporal dynamics captured in Figure 7 highlight the square's ability to shift its function throughout the day, from a space dedicated to religious activities in the morning to a lively communal gathering point by evening. This transition is shaped by the unique cultural and social practices associated with Eid al-Fitr, further emphasizing the square's role in fostering social interaction, community engagement, and inclusivity. The presence of police officers ensures the square remains secure and accessible, while the positioning of beggars at the edges reflects the complex social dynamics of public spaces, where inclusivity and social stratification coexist. The analysis of these behaviors underscores Merdeka Square's dual function as both a celebratory space and a site of social division, which evolves in response to the varied needs and behaviors of its users. The spatial and temporal analysis of Figure 7 reveals the adaptive nature of Merdeka Square during Eid al-Fitr celebrations. From the morning to the evening, the square's function evolves as it transitions from a logistical space focused on religious observance to a communal gathering point for social interaction. The police officers are essential in ensuring the square's security, both during the morning prayers and throughout the day as crowds increase. Their role in crowd management ensures that the square remains safe and accessible for all users.

The beggars, while occupying the edges of the square, demonstrate the inclusivity of public spaces like Merdeka Square. Despite being a marginalized group, they are able to occupy space within the square during a major public celebration. The marginalization of beggars to the edges, however, could be seen as a reflection of the social inequality that persists even in public spaces designed to be inclusive. The spatial positioning of beggars and the contrast between the lively center and the quieter edges of the square suggest the complex social dynamics that unfold in public spaces during such celebrations. This division between the central active area and the peripheral spaces occupied by beggars is an example of how public spaces can evolve and adapt in response to different user groups. While some groups are more visibly integrated into the celebration, others are relegated to the periphery. This reflects the dual role of Merdeka Square as both a celebratory space and a site of social stratification, which is common in urban environments [18] [19].

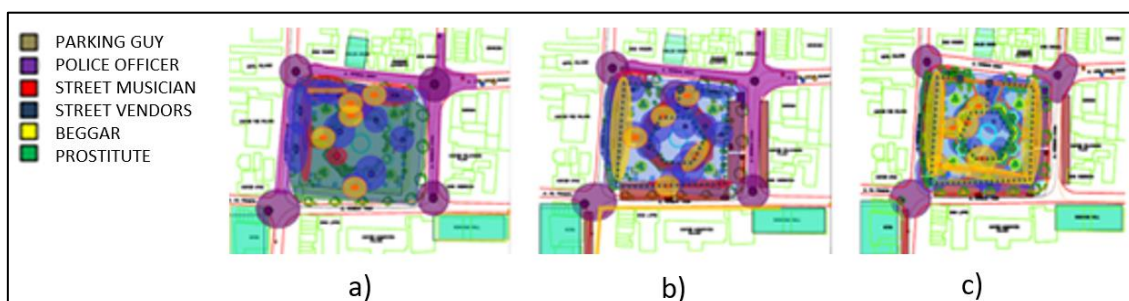


Figure 7 Eid-al Fitr situation of the permanent users as an attraction to the non-permanent users from a) morning, b) noon till afternoon and c) evening to night time. Police officers were guarding near the great mosque area and beggars filled the square during the evening. They gathered around the edge of the square

Building upon the insights gained from the Eid al-Fitr celebrations, we now turn our focus to the dynamic role of Merdeka Square on Fridays. The square exhibits notable versatility, adapting to both cultural and commercial needs, as demonstrated in Figure 8. As a space that evolves throughout the day, from a quiet morning to a bustling evening, Merdeka Square showcases its functional flexibility. The behaviors of permanent users, such as street musicians and vendors, play a significant role in shaping the square's spatial usage and rhythms. These permanent actors contribute to the square's transformation, making it a cultural and commercial hub. The analysis highlights how Merdeka Square adjusts to the changing social contexts of the day, from supporting everyday routines in the morning to facilitating social gatherings and leisure activities by evening. This adaptability demonstrates the square's importance as a public space that responds to diverse user needs and fosters social engagement.

The analysis of Figure 8 offers insights into the functional versatility of Merdeka Square on Fridays. Street musicians and street vendors, as permanent users, significantly shape the square's spatial usage and temporal rhythms, demonstrating how permanent actors influence the public space. The progression from a quiet morning to a crowded evening illustrates the square's role as a cultural and commercial hub that adapts to the needs of its users throughout the day. The place-centered mapping approach emphasizes the adaptive nature of public spaces [20] [21], where permanent users like street musicians and vendors adjust their locations and activities in response to changing social contexts. These users are attractors for non-permanent users, guiding the flow of pedestrian traffic and fostering social engagement. For example, street musicians not only provide entertainment but also act as cultural markers that define the square's identity, while street vendors create an informal economy that reflects the local character of Merdeka Square. Together, these permanent users help facilitate interactive public space, making the square a central location for commerce and social interaction on Fridays. The evolution of the square's use from morning to evening demonstrates the concept of temporal adaptation in urban public spaces. The morning and afternoon periods are marked by incremental increases in crowd size, while the evening reflects the culmination of the day's activities, where the square's full potential as a social and cultural space is realized. This shows how the square adapts to the rhythms of everyday life, with street vendors and musicians occupying the space in such a way that they accommodate a variety of behaviors and needs—ranging from commerce in the morning to leisure and social gathering in the evening.

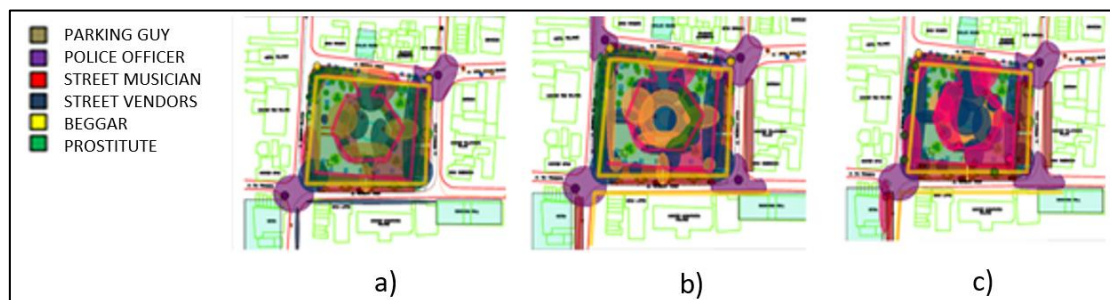


Figure 8 Fridays situation period from a) morning, b) noon till afternoon and c) evening to night time period. Street musicians and street vendors were the main users of the square on Fridays

Building upon the insights gained from the analysis of Merdeka Square's role on Fridays, we now shift our focus to how the square adapts to different social rhythms throughout the day, as illustrated in Figure 9. The square's function evolves significantly from a pedestrian shortcut in the morning to a vibrant social gathering point by evening, with the continuous presence of permanent users like street musicians influencing this transformation. This shift highlights the square's capacity to serve as both a functional transit space and an informal cultural hub, underscoring its versatility as an urban public space. The analysis of Figure 9 demonstrates how the design and positioning of Merdeka Square enable it to fulfill multiple roles, catering to both movement and social interaction. As the square adapts to the flow of users and the changing needs throughout the day, it reinforces the importance of such spaces in urban planning, reflecting how public spaces can support a range of activities and provide value to diverse user groups. The behavior observed in Figure 9 highlights the adaptability of Merdeka Square to different social rhythms throughout the day. From a pedestrian shortcut in the morning to a social gathering point by evening, the square's function evolves based on the

changing flow of users and the activities of permanent users like street musicians. The presence of these musicians throughout the day suggests that public spaces can retain their role as informal cultural hubs, even when the primary function might initially be one of movement and transit [22] [23].

The square's use as a shortcut for pedestrians is an important aspect of its spatial flow. It reflects how the design and location of Merdeka Square facilitate not only leisure activities but also functional needs, such as movement across the urban environment. The square is strategically positioned to serve multiple purposes: it functions as a passageway for people moving between different parts of the city and as a destination point for those who wish to stop, interact, or engage with the public space more fully. This multi-use role enhances the square's relevance in urban planning, as it demonstrates how public spaces can adapt to different needs and function in multiple ways throughout the day. The evolution of the square from morning to evening demonstrates a shift in how permanent users interact with the square. Street musicians, whose presence is consistent throughout the day, adapt to the changing crowds and the square's evolving functions. In the morning, they create a subtle background to the square's quieter atmosphere, while by evening, they transform the space into a lively cultural scene. This temporal adaptability is crucial to understanding how Merdeka Square can respond to both the functional demands of daily transit and the social demands of communal gathering.

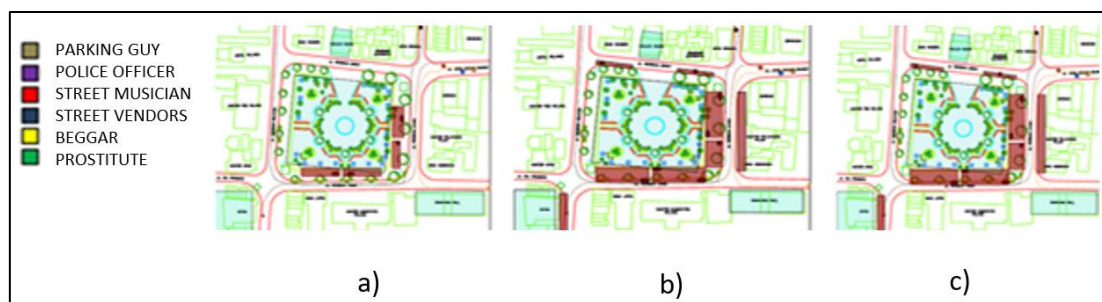


Figure 9 Weekdays mapping from a) morning, b) noon till afternoon and c) evening to night time. Street musicians gathered around the square. The square has functioned as a shortcut for pedestrians

Place-centred maps showed the behaviour of Merdeka Square's users during events and common days. This square had seven groups of permanent users. They are the parking guy, police officers, street musicians, street vendors, beggars and even prostitutes. The maps showed how permanent users worked inside, at the centre or around the edge of the square. Street vendors and street musicians had the wider territory, followed by police officers and other users. Those permanent users attached other non-permanent users to come and vice versa. They could've come because many people were gathering inside the town square. Merdeka Square acted as a city park and became more than just a tourist destination. It is a work field for some people.

Architectural Functions Analysis

Therefore, a new adaptive design should be created to help people maintain their activities within Merdeka Square, ensuring that it remains open and functional as an adaptive public space. The architectural functions analysis was conducted based on observations to understand the needs of the square's users. During this observation, several changes and issues were identified, which led to the development of a new adaptive design in response to the COVID-19 post-pandemic era. Table 1 presents an analytical description of Merdeka Square's architectural functions, highlighting key physical settings and their transformations during the pandemic. One significant change was the introduction of guardrails, which were initially placed during the COVID-19 pandemic to control access. However, in response to the growing demand for more open space, these barriers were later opened by citizens. The garbage cart base, originally serving its waste management purpose, was repurposed to also function as a parking and sitting area. The parking area itself saw a doubling of its use, not only as parking for visitors but also for those attending the nearby Great Mosque. The sitting area, equipped with facilities such as Wi-Fi and water stations, was designed to offer a space for relaxation. However, the comfort of these areas led to prolonged sittings, which created some behavioral issues. The

skating area, originally intended as a skate park, transformed into a casual sitting spot where visitors could relax or take photos. The center of the square, designed for movement, became a gathering space for eating, drinking, and socializing, even after the fountain ceased operation. The small office area became a focal point for administrative tasks, such as queuing for taxes or licenses, though it sometimes violated health protocols by attracting large crowds. Lastly, the playground and gym area, although some gym equipment was not in use, became overcrowded with street vendors, thus turning it into a business hub. These observations highlight how the square's architectural functions evolved to meet the changing needs of its users during the pandemic and underscore the need for an adaptive design that supports the square's continued role as a dynamic public space [24].

Table 1 Analytical description of Merdeka Square's architectural functions.

No.	Physical Setting	Analysis
1.	Guadrails	The park was occupied with guardrails during the COVID-19 pandemic, but was forced to open by citizens.
2.	Garbage Cart Base	Switch functions to parking and sitting places
3.	Parking area	The square's parking area was also being used as a parking area for visitors to the Great Mosque.
4.	Sitting area	Equipped with a shelter located in the corner of the square to eat, drink, wait and chat on their seats. The wi-fi facility and ready-to-drink water completed the fountain's sitting area, but attracts people to sleep or sit longer. This comfy place led some misbehaviour actions and makes new crowds by sitting too long.
5.	Skating area	The area was designed similar to a skate park and specifically used for a skate park. But, this area often used as a place to sit and take photos.
6.	Center	People were using this area to sit, eat and drink even though the fountain has stopped working. Some people who went to mosque, often stop by to sit.
7.	Small Office	This area was filled with visitors queuing for their taxes and license business. Long queues made new crowds against the health protocols.
8.	Playground and Gym Area	Although some of the existing sports equipment cannot be used, this area turned into a crowded business area. Many street vendors entered the park, even the carriage parked outside the fence to attract people.

Playground and Gym Area

The design proposals for the Playground and Gym Area in Merdeka Square emphasize adaptive features that facilitate safe and enjoyable experiences for children, particularly within the constraints of the COVID-19 pandemic. Figure 10 introduces new game facilities with strategic design adjustments to maintain social distancing while encouraging play. The design incorporates separated individual games, each with unique entrances and varying elevations, ensuring that children maintain physical distance while engaging with the space. These distinct elevations, coupled with narrow entrances, guide children to play independently, while also creating a natural queuing system. Such spatial organization not only ensures physical distancing but also allows children to move freely without clustering, thereby reducing the likelihood of crowding. By designing the space with specific individual sizes in mind, the design subtly controls behavior while still promoting interactive play, preventing children from stepping into each other's space due to the calculated individual sizes and separated zones [25].

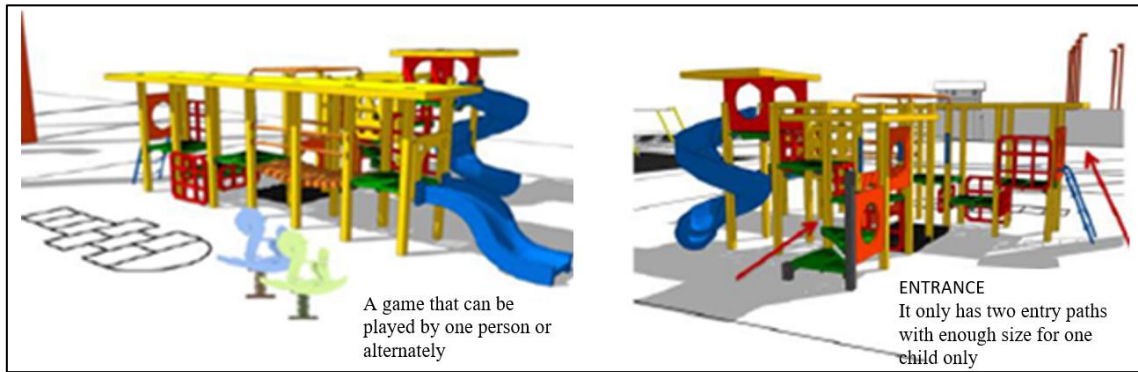


Figure 10 New game facilities to occupy children's need a) individual games, b) different and small entrance and different elevation to make them queue. The new designs allow children to play, but at the same time keep their distance

Building on this, Figure 11 presents individual swings that are similarly designed to ensure social interaction while adhering to health protocols. The swing system ensures that each child has a designated space to enjoy the activity independently, thus reinforcing both physical distancing and the playful atmosphere. These adaptive features highlight how Merdeka Square's playground design not only responds to the need for safe public spaces in the post-pandemic era but also offers a solution to a critical challenge—allowing children to play while preventing the spread of the virus. The innovations in both designs underscore the potential of public spaces like Merdeka Square to evolve dynamically, adapting to the shifting needs of its users while continuing to prioritize public health and safety. In essence, these designs not only ensure a safe environment for children but also foster social interaction in a controlled manner. The separation of play areas and the strategic design of the space show how the built environment can guide behavior, making it easier to maintain distance and reducing potential risks, all while supporting social connectivity [26]. These adaptive features, particularly the spatial configurations and individual game setups, highlight the resilience of public spaces like Merdeka Square, demonstrating their ability to accommodate a diverse range of needs, particularly in times of health crises. Such designs make Merdeka Square a model for resilient and flexible communal spaces that prioritize public safety while fostering a sense of community engagement.



Figure 11 Individual swings to let them have fun and interact with safe health protocols

Sitting Areas

The sitting areas in Merdeka Square have undergone significant adaptive changes to meet the evolving needs of the community, particularly in response to the COVID-19 pandemic. As illustrated in the design, the seating area, which includes tables, has been minimized in number and spaced strategically to discourage prolonged seating. This design choice not only promotes movement within the square but also encourages a quick turnover of users, thereby reducing overcrowding and adhering to social distancing guidelines. The park benches, as shown in Figure 12, are another key feature of the adaptive design. These benches are individually spaced to ensure that each person can sit while maintaining an appropriate distance from others. This careful spacing aligns with the square's broader goal of creating a socially responsible public space, where individuals can rest and engage with the environment while maintaining safety protocols. Furthermore, the inclusion of sinks nearby adds an extra layer of hygiene, promoting sanitation and preventing the spread of the virus in a high-traffic area.

Additionally, the unique pavements designed for queueing serve as an important tool to manage social behavior and ensure that people can safely wait in line without breaching health protocols. The combination of these carefully thought-out features – individual seating, proper spacing, nearby sanitation facilities, and organized pathways – highlights how Merdeka Square's sitting areas have adapted to the public's evolving needs while maintaining functionality, accessibility, and social engagement. These adaptive design elements illustrate how public spaces can be reimagined to serve both health and social needs, fostering a resilient and adaptive urban environment suitable for the post-pandemic era [27]. This comprehensive approach aligns with the broader objective of creating public spaces that are not only inclusive and comfortable but also resilient to future challenges.



Figure 12 Adaptive benches designed as architectural functions in the sitting area

Sculpture and Amphitheatre

The addition of the sculpture and amphitheater, as shown in Figure 13, plays a crucial role in enhancing Merdeka Square's appeal by offering both aesthetic value and functional utility. Strategically placed at the center of the square, these features serve as the main attractions, effectively drawing visitors and creating a dynamic space where people can gather, socialize, and engage in various activities. The sculpture and amphitheater not only elevate the square's visual attractiveness but also foster an environment of entertainment and cultural interaction, making it a prime destination for tourists and local visitors alike. This shift encourages outdoor tourism and public interaction, as people now have more reasons to spend time in the open space rather than indoors.

The design of the sculpture and amphitheater is aligned with the goal of transforming Merdeka Square into a resilient and adaptive public space, especially in the post-pandemic context. By centralizing activities around these features, the space encourages social interaction in a safe manner, while discouraging isolated gatherings in less visible areas. The resulting dynamic helps ensure the square remains lively and accessible, while minimizing the risk of problematic activities. The centralized layout draws attention away from secluded spots, promoting the use of the entire space and reducing the likelihood of illicit behaviors, such as prostitution, which could have previously occurred in isolated corners of the park.

Moreover, the presence of these permanent structures serves not only to attract visitors but also to maintain order and safety in the square [28]. They allow for more organized movement and interaction, contributing to a sense of security and community. As a result, the sculpture and amphitheater do more than just provide cultural enrichment—they reshape human behavior by encouraging the use of the square's full potential. This adaptive design illustrates how urban spaces can evolve to meet the needs of both the public and the broader urban environment, offering both cultural enrichment and a more organized, health-conscious space for interaction in the post-pandemic era.



Figure 13 Sculpture and Amphitheatre as the center of attraction

Service Centre

The service center and its associated facilities, as depicted in Figure 14, play a crucial role in managing user behavior and enhancing the function of Merdeka Square in the post-pandemic era. The service center is strategically placed at the center of the square, complemented by additional toilet units to meet the public's essential needs. This central location serves as a hub for directing visitors to appropriate areas, ensuring the smooth and orderly flow of people within the space.

One of the key design features in this area is the queueing system, which encourages visitors to maintain safe physical distances while waiting for services. Small stepping stones are incorporated into the design, with each stone intended for one individual only. This deliberate separation of individuals helps prevent overcrowding, while also making it clear where people should stand, thereby promoting discipline and order. The contrast between the green areas and the concrete spaces further reinforces the queueing system, making it visually obvious to visitors where they should position themselves. These facilities, including the queueing area and service center, address the broader need for structured and adaptive public spaces in the face of health and safety concerns, particularly in a post-pandemic world. By organizing the movement of visitors and ensuring that they remain spaced apart, the design promotes not only safety but also a more enjoyable and efficient experience [29]. Ultimately, these interventions enhance Merdeka Square's function as an inclusive, socially responsible space that balances public health protocols with the need for community engagement and interaction.



Figure 14 New facilities to overcome the misbehaviours of the users: a) queueing area b) service centre

Skatepark

The design of the skatepark in Merdeka Square, as depicted in Figure 15, has been thoughtfully adapted to optimize space usage and promote safety during the post-pandemic era. By eliminating seating within the skatepark itself, the design ensures that the area is fully dedicated to active use, allowing for better movement and reducing the risk of overcrowding. The track is specifically designed for individual use, enhancing the functional efficiency of the space and providing ample room for people to engage in physical activity without

hindrance. This approach aligns with the need for social distancing and helps maintain the flow of users while fostering a more dynamic and engaging environment for those using the skatepark.

Furthermore, the seating area for companions is strategically placed at the center of the square, away from the skatepark. This arrangement ensures that individuals waiting for their partners or children can comfortably do so while maintaining appropriate physical distance. The interspersed greenery around the seating area not only creates a pleasant environment but also reinforces social distancing measures by spacing users apart. This integration of the skatepark design with the central seating area exemplifies how public spaces can be adapted to meet the demands for both activity and safety [30] [31]. The careful planning of these spaces highlights Merdeka Square's ability to remain a functional, inclusive, and socially responsible space, catering to the community's needs while adhering to post-pandemic guidelines.

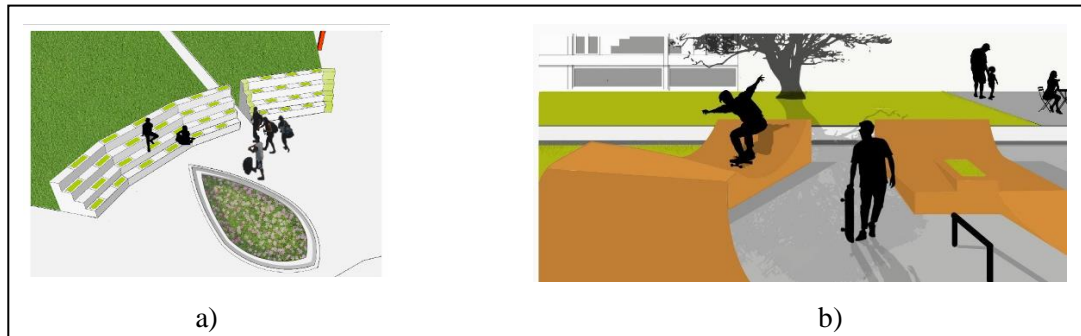


Figure 15 a) sitting area at the centre of the square for the companions b) no sitting area inside the skate park

4. Conclusion

Merdeka Square has been changed from time to time, showing that this square has developed into an adaptive communal space. The square brings an important role to the community, as a city park, tourism destination and even work field. It changes every time, depending on the occasion but still holds the same important role as a communal space. Merdeka Square can even solve—not just tourism—but also economic problems caused by COVID-19. It has an essential role for some permanent users and supports outdoor activities. Merdeka Square fulfilled the needs of its people, but can be developed more and more due to the issues and conditions that will be happened ahead. Every place could affect human behaviour and vice versa. Merdeka Square acted as a controller for citizens' behaviour. Therefore, previously shown design recommendations are new strategies to face post-pandemic era. Government and their people should work as a team to maintain urban resilience. Communications between government and their people are essential, it is shown by the history of the town square. Merdeka Square has its own identity as a historical urban space that should be last forever, even through some changes. This is how an adaptive design should be done.

5. Acknowledgements

The authors would like to express their sincere gratitude to the Architecture Department of the Faculty of Engineering, Brawijaya University, Malang, Indonesia, for their support in conducting this research. Special thanks are extended to the local authorities and residents of Malang who participated in the study and provided valuable insights into the use of the Merdeka Town Square. We also appreciate the assistance of the reviewers and the editor for their constructive feedback during the revision process.

6. Conflict of Interest

The authors declare that there are no conflicts of interest related to this study. The research was conducted with complete independence and no external influences from funding bodies, sponsors, or organizations.

References

- [1] Paiman, P. (2022). Pandemic COVID-19: A challenge and opportunity for health and sports physical education learning in junior high schools. *MAJORA: Majalah Ilmiah Olahraga*. <https://doi.org/10.21831/majora.v28i1.56003>
- [2] Ahmed, M., & Anbrine, S. (2022). Structural positioning of mosque in the development plan of the federal capital of Pakistan. *Journal of Islamic Thought and Civilization*. <https://doi.org/10.32350/jitc.121.19> (Ahmed & Anbrine, 2022).
- [3] Khurana, I., & Dutta, D. (2023). From place to space: the emergence and evolution of sustainable entrepreneurial ecosystems in smart cities. *Small Business Economics*. <https://doi.org/10.1007/s11187-023-00765-3>
- [4] Altman, et al. *Place Attachment-Human Behavior and Environment*. (1992).
- [5] M. Hidalgo, *Operationalization of Place Attachement*. (A consensus proposal Estudios de Psicologia, 2013).
- [6] Winata, E. Sofian, S. Geldin and K. Qui. *Adaptive Governance for Building Urban Resilience: Lessons from Water Management Strategies in Two Indonesian Coastal Cities*. (Journal Perancangan Pembangunan, 2017).
- [7] Anggiani, M., Ayudya, R., & Hirda, A. (2025). Sense of place attachment of user in public open space commercial building in West Jakarta. *BIO Web of Conferences*. <https://doi.org/10.1051/bioconf/202515906005>.
- [8] Daware, T., & Dhote, T. (2023). Enhancing Public Safety Through Real-Time Crowd Density Analysis and Management. 2023 5th International Conference on Inventive Research in Computing Applications (ICIRCA), 1040-1046. <https://doi.org/10.1109/ICIRCA57980.2023.10220731>.
- [9] Bensemman, F. (2021). Movement Through the Marginalised: An Urban Landscape Investigation. . <https://doi.org/10.26686/wgtn.16606733.v1>.
- [10] Morgan, J. (2021). Policing Marginality in Public Space. *SSRN Electronic Journal*. <https://doi.org/10.2139/SSRN.3818305>.
- [11] Ashford, C., & O'Brien, M. (2022). Counter-Cultural Groups in the Age of Covid: Ravers, Travellers and Legal Regulation. *The Journal of Criminal Law*, 86, 241 - 255. <https://doi.org/10.1177/00220183211073641>.
- [12] Karsono, B., Arar, M., Luthfi, I., & Deni, D. (2022). Dominating the Space: Uncover the Existence of Street Vendors in Public Space, The case of Tengku Amir Hamzah Square, Stabat, Indonesia. *International Journal of Engineering, Science and Information Technology*. <https://doi.org/10.52088/ijesty.v2i4.394>.
- [13] Aye, K., & Sarma, B. (2022). Street vending and urban public space. *International journal of health sciences*. <https://doi.org/10.53730/ijhs.v6ns8.9667>.
- [14] Dunaevska, A., Slipchenko, V., & Kurilovych, K. (2024). Public Space and its Impact On People. *Regional problems of architecture and urban planning*. <https://doi.org/10.31650/2707-403x-2024-18-119-129>.
- [15] Lafrenz, A. (2022). Designing Multifunctional Urban Green Spaces: An Inclusive Public Health Framework. *International Journal of Environmental Research and Public Health*, 19. <https://doi.org/10.3390/ijerph191710867>.
- [16] Alawi, M., & Chu, D. (2024). New approach to integrating disaster resilience into public open space planning and design. *Journal of Infrastructure, Policy and Development*. <https://doi.org/10.24294/jipd.v8i9.5222>.
- [17] Trenz, H., Heft, A., Vaughan, M., & Pfetsch, B. (2021). Resilience of Public Spheres in a Global Health Crisis. *Javnost - The Public*, 28, 111 - 128. <https://doi.org/10.1080/13183222.2021.1919385>.

- [18] Başaslan, Z. (2022). The Square as a Tool of Social Communication And Socialization. *European Journal of Social Sciences Studies*. <https://doi.org/10.46827/ejsss.v7i4.1258>.
- [19] Mohamed, K., Eraqi, A., & Milad, M. (2022). The Public Realm Supporting Social Interactions and Priorities of Improvement. *Journal of Advanced Engineering Trends*. <https://doi.org/10.21608/jaet.2021.66821.1095>.
- [20] Messeter, J., & Johansson, M. (2008). Place-specific computing. *Proceedings of the 7th ACM Conference on Designing Interactive Systems*, 99–108. <https://doi.org/10.1145/1394445.1394456>
- [21] Brownell, K., Khan, A. D., Brooks, D., & Wei, G.-Y. (2009). Place and route considerations for voltage interpolated designs. *2009 10th International Symposium on Quality of Electronic Design*, 594–600. <https://doi.org/10.1109/isqed.2009.4810361>
- [22] Gibson, C., & Homan, S. (2004). Urban Redevelopment, Live Music and Public Space. *International Journal of Cultural Policy*, 10(1), 67–84. <https://doi.org/10.1080/1028663042000212337>
- [23] Gibson, L., & Stevenson, D. (2004). Urban Space and The Uses Of Culture. *International Journal of Cultural Policy*, 10(1), 1–4. <https://doi.org/10.1080/1028663042000212292>
- [24] Mao, D., Yang, H., Zhang, S., Sun, H., & Wang, X. (2023). Adaptive Behavioral Dynamics in Public Open Spaces During the COVID-19 Pandemic: A Technological Perspective on Urban Resilience. *Journal of the Knowledge Economy*, 15(3), 12651–12677. <https://doi.org/10.1007/s13132-023-01591-4>
- [25] Boon, B., Rozendaal, M., van den Heuvel-Eibrink, M. M., van der Net, J., & Stappers, P. J. (2016). Playscapes. *Proceedings of the The 15th International Conference on Interaction Design and Children*, 181–189. <https://doi.org/10.1145/2930674.2930713>
- [26] Pinter-Wollman, N., Jelić, A., & Wells, N. M. (2018). The impact of the built environment on health behaviours and disease transmission in social systems. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 373(1753), 20170245. <https://doi.org/10.1098/rstb.2017.0245>
- [27] Moghaddam, S. N. M. (2024). Introduction—Navigating Pandemics in Urban Spaces: Challenges, Strategies, and the Future of Urban Planning. *Making Sense of Planning and Development for the Post-Pandemic Cities*, 1–26. https://doi.org/10.1007/978-981-97-5481-6_1
- [28] Zakariya, K., Harun, N. Z., & Mansor, M. (2015). Place Meaning of the Historic Square as Tourism Attraction and Community Leisure Space. *Procedia - Social and Behavioral Sciences*, 202, 477–486. <https://doi.org/10.1016/j.sbspro.2015.08.196>
- [29] Hayes, D., & MacLeod, N. (2007). Packaging places: Designing heritage trails using an experience economy perspective to maximize visitor engagement. *Journal of Vacation Marketing*, 13(1), 45–58. <https://doi.org/10.1177/1356766706071205>
- [30] Abulhawa, D. (2020). Girls and women holding and creating space in skateboarding. *Skateboarding and Femininity*, 16–43. <https://doi.org/10.4324/9781003025740-2>
- [31] Abulhawa, D. (2020). Skateboarding physical culture. *Skateboarding and Femininity*, 62–80. <https://doi.org/10.4324/9781003025740-4>