

Original Article

# The Influence of Digital Space on Space Function Activities and Sustainability Factors of Local Activity at Cyber Villages

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**Abstract** - This paper examines changes in activity in a space function that occur during the process of entering digital technology into space and elements of people's lives. Furthermore, this paper examines the factors affecting the sustainability of conventional local social and cultural activities in a settlement that carries the development of digital villages, namely the Cyber Village—using behavior mapping analysis in the field directly, with daily observation, monthly and event / incidental activities in Kampung Cyber. The results showed two forms of activity changes that occur when the digital space meets conventional space, namely activity modification and activity change. The sustainability of local social and cultural activities caused by changes in these activities can be maintained through public spaces are shared spaces that can be a forum for local social and cultural activities.

**Keywords** - Digital space, Space function, Local activity, Cyber village.

## 1. Introduction

Recent studies have investigated the development of activities in a changing space because it is produced with technology through digital spaces. The knowledge of space and place transforms over periods and culture, slowly shaping functions and activities in those spaces.[1].With the advent of digital technology, individuals are drawn to the digital world for various reasons. The recent Covid-19 pandemic has brought technological awareness to every corner of society. By generating connections and disruptions between multiple space-times, digital technology in space has established a new culture that plays a major role in everyday life [2-3]. As a result, the city, space, and society have received both beneficial and harmful implications [4-7].

Smart cities and digital thematic areas have emerged due to digital and space advances. Kampung Cyber in Patehan Village, Palace District, Yogyakarta Special Region City, where this research is being conducted, is one of the current digital thematic areas. The notion of a cyber village has been used since 2008, and this Cyber Village has drawn tourist visitors in general and is a platform for learning visits for IT students and researchers. Furthermore, the use of technology in Kampung Cyber has piqued attention and acquired fame due to visits by celebrities such as Mark Zuckerberg, the founder of Facebook, the king and queen of the Netherlands, to domestic figures such as mayors trying to learn to develop cyber thematic villages [8–11].

Several studies on digital space show that digital media technology has restructured space, and the spatial and temporal proximity of digital media culture presents new challenges, where technology emerges as a new culture growing in people's lives, changing activity spaces by providing social experiences, playing, entertainment (art), and trading in digital rooms, which were previously conducted in conventional rooms [2, 3, 12–15]. This also creates a virtual coating of digital data and relations chances that extends into the real world [16].

Several implications of the digital environment experience began to be felt; Crawford [17], through his research, concluded that the digital room's experience is comparable to that of additional themed sites such as fast-food restaurants and enjoyment parks; this is a concept of "nonplaces" to create a sense of uniqueness, managing, and flee in a culture that increasingly delivers nothing. Problems around new chances for social command by corporate and political stakes are raised in the interaction aspect, causing social anxiety [18]. Knoblauch & Löw [19] explains that Due to trans localization, i.e., the straight incorporation of different locations in conjunction with the increased relevance of its individual location, space is constituted in a mediated form motivated by advances in digital communication technology, resulting in proactive and reflexive communicative measures at various scales and levels.



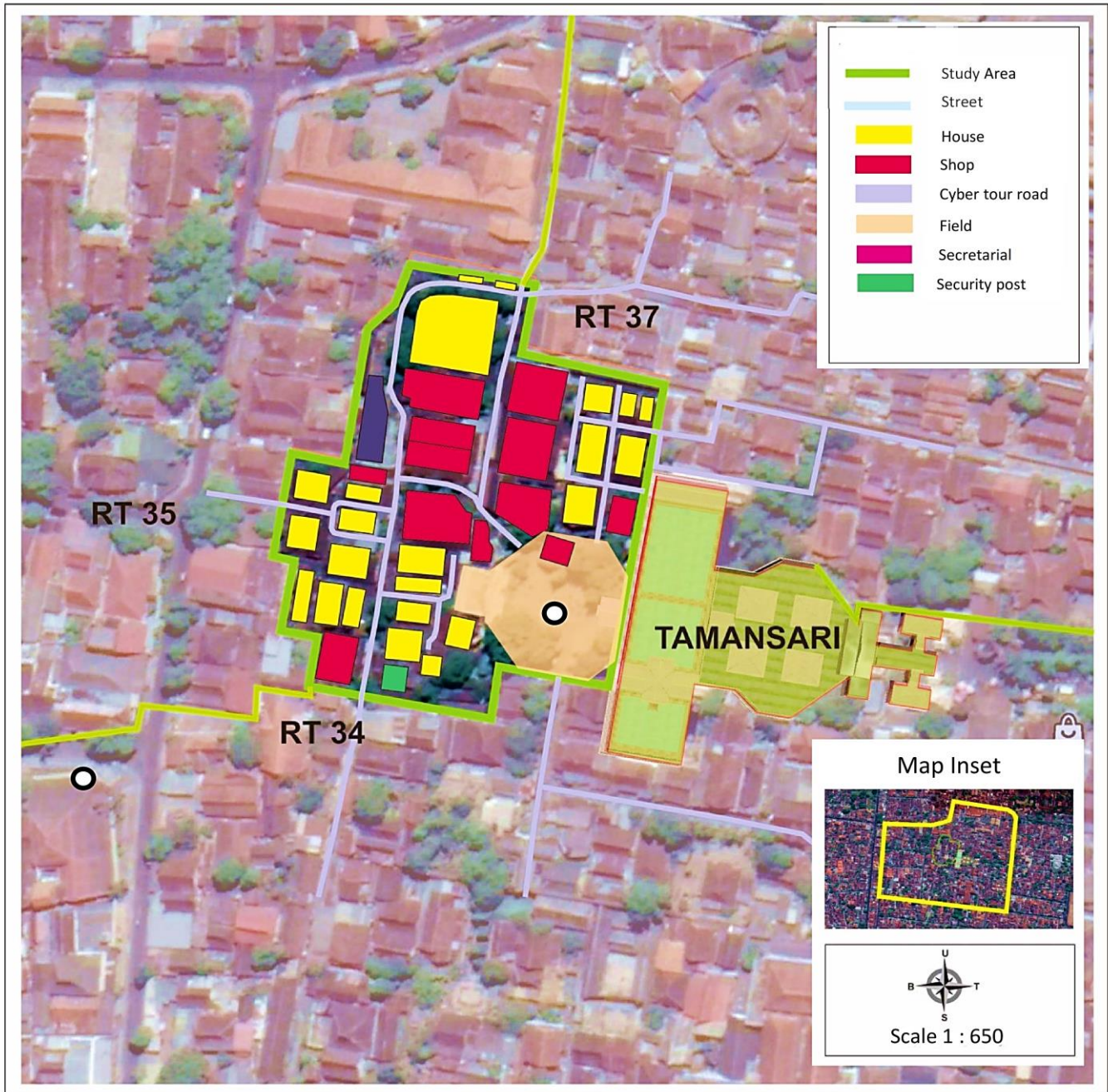


Fig. 1 Observation Area

In the digital technology era, there have been changes in space production. Abstract digital representations are becoming increasingly layered in urban contexts. Lefebvre, one of the leading pioneers in social space, believes that using computing technology would result in substantial changes in society, but how is this space created in a digital context? Memory is assumed in Lefebvre's statement about space production, and space is implicit in Stiegler's argument about the exteriorization of memory in engineering. However, predictions about essential transformations to the exact mechanism of space production carried about by advances in

digital technology still need to be thoroughly investigated [20-21]. Looking at previous studies that have raised the change of space by digital space through the experience provided and the impact that arises, the motivation of this study is to complement them by examining how the form of change in space function is reviewed from its emerging activities and what aspects of activities can maintain local activities of conventional spaces in Kampung Cyber so that technological developments do not erode them and to minimize the impact of technological development. In the world, the technology that is caught will continue to increase at a quick pace.

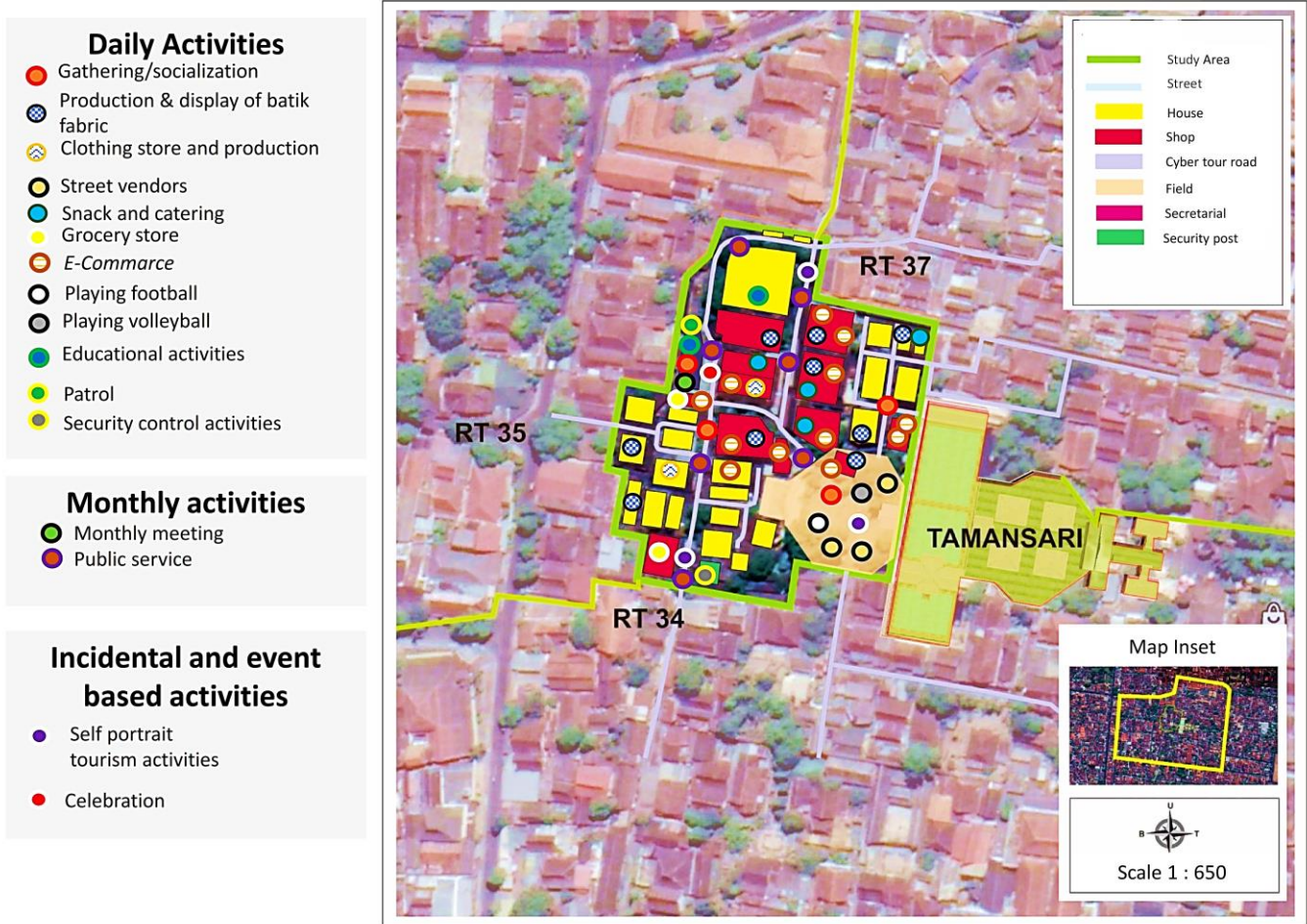


Fig. 2 Activity distribution

## 2. Literature Review

The study examined changes in activity in spaces affected by technological advances and reviewed factors that could sustain conventional local activities. The parameters of space and activities in it will be units of information in this study. The two main theories derive from two frameworks of thought related to space and activity from Lefebvre, Rapoport and Gehl.

Space theory, Lefebvre's conception of spatial practice, representation of space, and representational space [22] provides a theoretical framework for this article, which recognizes the productive relationship between space and the relation of activity within it. With regard to digital space, Lefebvre coined the term 'abstract space' and described this kind of spatial logic with the digital spatial provision that opens up abstract relationships with space [12], [23] Lefebvre's theory underlies the analysis that activity can be produced or altered by space.

In activity theory, Lefebvre mentions that every society produces a distinctive material space, 'place', as a space

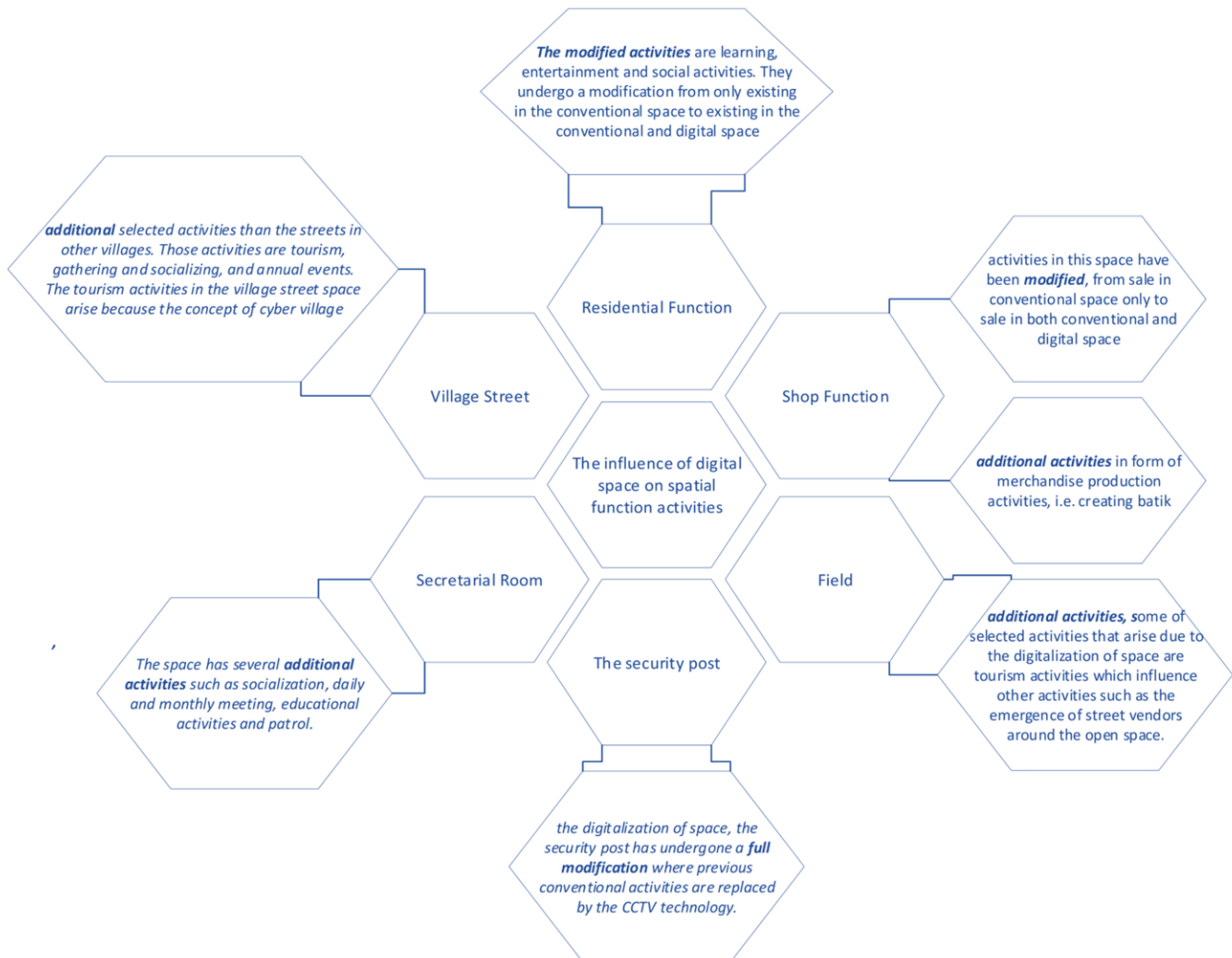
defined by social activity [24-25]. Behaviour activities also exert an influence on space, referring to the Rapoport, which gives the theoretical idea of activities that arise and are formed because of space, as well as the space that forms and gives rise to activity [26]. Rapoport's theory also corroborates the analysis theory that activity can change based on the meaning of a space function. Division of activity reviews in this study, using Gehl's theory of activity, divides activity into primary and preferred activities [27-28].

## 3. Materials and Methods

This study employed a qualitative approach with behaviour mapping analysis techniques. Behaviour mapping is a technique of mapping people's activities and behaviour in a space function. Its purpose is to describe the function of space behaviour in maps, identify types and frequencies and show the relationship between these behaviours and specific design forms [29-30]. Mapping this behaviour can be done directly when it is also in a place, comparing the physical characteristics of the environment with information on the behaviour of residents through the recording of location and temporal attributes [31-32].

**Table 1. The distribution of observation activities in spaces (periodic)**

Room	Day	Time
House	Weekdays (Monday-Friday)	Morning, Afternoon, Afternoon and Evening
Office	Weekend (Saturday-Sunday)	Morning, Afternoon, Afternoon and Evening
Road	Event (specific day of celebration)	Morning, Afternoon, Afternoon and Evening
Court	Weekdays (Monday-Friday)	Morning, Afternoon, Afternoon and Evening
Secretarial	Weekend (Saturday-Sunday)	Morning, Afternoon, Afternoon and Evening
Security Post	All days (Sunday-Saturday)	Morning, Afternoon, Afternoon and Evening



**Fig. 3 Result The influence of digital space on spatial function activities: additional and modified activity**

The type of behaviour mapping technique used in this study is "place center mapping" behaviour at a time at a specific place. The steps of this technique consisted of sketching a place /setting that includes the entire physical element that is thought to affect the behaviour of the space used. The second step was to make a list of behaviours to be observed and specify the symbols/sketch marks of each behaviour. Then within a certain period of time, the researchers recorded the behaviour that occurred in the place by using symbols on the basic map prepared [33].

This research began with periodic behaviour mapping to identify activities in space functions. Behaviour mapping is also used to see if space connects with digital technology (abstract space). After being identified by the two, periodic field observations were conducted again so that a variety of activities were found in the function of space connected with digital technology (abstract space). This variety of activities was analysed, whether the impact on the activity in the space and the reliability factor of local activities, then conduct interviews as the primary source and validate the results.

## **4. Results and Discussion**

Based on the observation area in Figure 1 and the division of activity in spaces such as Table 1, the identification of community activity mapping in Kampung Cyber shows that there are several functions of space connected to digital space (abstract space). They are residential space, shop space, field space (open space), security space (security Posts), secretarial room, and road room (village road) functions.

### **4.1. Residential Function (House)**

The main activity in the residential function does not change as a place to live. However, the choice activity becomes modified, giving rise to additional choice activities. The modified selected activities are learning entertainment, and social activities. These three preferred activities are modified from only existing in conventional spaces to being in conventional and digital spaces. While the increased choice activity is economic activity in the form of e-commerce that uses digital space as the place of its activities, marketing through digital media makes new activities appear again at home, namely merchandise production activities sold alone or as support for activities in the function of the shopping room.

### **4.2. Shop Function**

The main activity in the shop function does not change as a trading activity. Still, the main activity in this room undergoes modifications, from initially only selling conventionally to being in the convention room and digital space. The results of modifying this space activity make merchandise products widely marketed and impact the emergence of additional activities in the form of merchandise production activities such as batik (traditional crafts).

### **4.3. Court (Field)**

The court or field becomes an open space owned by a cyber village, an open space with a public function. This space accommodates many activities of the cyber village community. The main function of open space as a social space and sports runs well in this space, and the activity is still conventional by using physical space in the field. Some of the preferred activities that arise due to the digitization of space are tourist activities that impact other activities, such as the presence of street vendors in the field.

### **4.4. The communal security posts**

The communal security post has the main function as a communal security post; usually, the communal security room becomes a basecamp for the community who are on guard to maintain the community's security. But with the digitization of space, the security post has been fully modified. This modification results in the disappearance of previous conventional activities and is replaced with digitization in the form of CCTV. The communal security post is currently undergoing a modification of its function as a security control room that relies on CCTV technology as its supervisor.

### **4.5. Secretarial**

The secretarial room is a building space used as an administrative activity in the cyber village. The secretarial room is a building space in Kampung Cyber utilized for administrative purposes. This room is transformed into a location where additional activity activities take place. These activities serve as a social activity space, serving as a venue for daily to monthly conversations (monthly meetings), educational activities, and communal security. The rise of cyber villages has resulted in people using this space for both formal and casual gatherings, resulting in social activities. Educational activities take place at two points during the community's digital training and in an academic area for student field studies and research. The communal security activity appears in this secretarial room because, as the previous explanation, the communal security room has undergone modification of activities from conventional to digital. Its security function is replaced with a CCTV control room. But interestingly, here, the community still maintains conventional communal security activities by moving their activities to the secretarial room. The secretarial room was chosen as a place for communal security base camp activities because it has a broader space than the previous security post room to accommodate more residents involved in communal security.

### **4.6. Village Road**

The village road serves as a place for communal events and vacant space for settlements. Its primary role as a circulatory system has not changed. However, the emerging choice activity becomes more than the streets in neighbour communities. Tourism, communal, and annual event activities are the most popular activities. Because the concept of cyber village tourism comprises cyber network tracers and murals on road barriers, tourist alternatives are active in the village road area. The activity of gathering and socializing emerges as a result of multiple intersections becoming the meeting point of community circulation, resulting in the emergence of social potential. The annual event selection activity can take the form of uniform and national events, which use road space as a forum for their activities.

### **4.7. Discussion**

As stated in the background and theory, digital space might cause problems with changes in people's social situations toward the individual and undermine existing local culture. However, as shown by Kampung Cyber, traditional activities continue to exist in the digital domain. In the case of lost activity, there is one space where activity is completely digitalized, resulting in the disappearance of traditional activities or local culture, namely the communal security room. However, traditional communal security activities are not lost in activity in the Cyber Village because they are transferred to the secretarial room. Based on the results of the study of space and activities in Kampung Cyber, the factors that can be sustainable for the local culture that exists in the

deconstruction of digital space are analysed. There are still efforts to carry out communal activities to socialize in the community, including discussions between citizens, monthly activities such as monthly meetings and community service, and annual events such as religious and national events. These activities continue to bind the community into real and physical social relations so that societal socio-cultural values can be maintained.

The existence of communal activities at point 1 is supported by spaces that have shared space, such as the use of open space (void) court or field and the use of village road space as a common space, as well as the use of building space (void) secretarial as a shared activity space. It can be concluded that increasing the function of shared space is needed to maintain the existing socio-culture of settlement. There is public awareness of using digital space as an economic and educational aspect that can bring tourism. These results reinforce previous research regarding the impact of the 4.0 revolution, which accelerates the dissemination of information and distance learning [34], as well as the advantages of digital marketing, such as real-time review and market expansion [35 - 36], that can be put to good use. This can be seen from the distribution of behavioural mapping results that use more digital space for the economic side (e-commerce) and become the advantage of utilizing digital space as a medium of public learning. Meanwhile, social activities and entertainment are still conducted conventionally. This can be seen from the many communal activities in various functions of available space. Conventional entertainment, such as playing volleyball and soccer, is still a daily activity of cyber villagers.

The Yogyakarta Cyber Village research is a continuation of Muhammad et al.'s research (2019) [8–11] which resulted in the application of technology in everyday life in Cyber Villages that did not diminish the social relations of the community. Detailed research from previous research related to the impact of technology on the function of space and its activities. As a result, there are increased space functions, partially and fully modified. Elsewhere research is presented by Peyrar [4-7] on the fast-growing Songdo City as a mega-urban project that is proclaimed as an exemplary "smart city", the functional and morphological differences: from the presence of vacant land near new towers to vegetable gardens in front of glamorous urban facilities, p. this has shown that "global surveillance" is a real paradigm for society. Space changes have also begun to shift to a technological space in the form of an abstract; Capener [20-21] also describes how the representation of space has begun to develop and can be felt in digital space through experiences shared on google maps. However, this study has other results, namely with the social control of the community, changes in space due to technology occur without much changing the value of the existing traditional space, for example, in a fully modified security room into a digital space, people make a traditional

security room back in place. Another (the secretariat room) is because there is a high social value (as a place for gathering and socializing the community) in the function of the security room so that even though it is fully modified by technology, it will reappear elsewhere because of the function of its social living space. This is the novelty of this research.

## **5. Conclusion**

Through behaviour mapping analysis, this study investigates how activity changes in space when met with the process of space digitalization and factors that keep local activities surviving and sustaining in the digitalization era. Unlike the previous behaviour mapping research, this research was conducted in the location of the thematic village with a development theme of the digitized area, namely cyber villages. This makes this research precisely locational because the digitization process becomes a development activity at the study site. Digitalization activities at the study site have been recognized by government institutions, private institutions, research institutions and educational institutions nationally and internationally, with many study visits to the location.

Empirical results of behavior mapping analysis of changes in activity showed that the activity of cyber kampung space experienced changes in activity near all functions of its space. This change in activity is indicated by the modification of the activity and the addition of the activity. The addition of activities will provide additional optional activities on the functions of cyber village spaces to further improve the quality of space because it has many choice activities. Unlike activity modification, activity modification consists of hybrid activities (carried out offline / conventionally or online/digital) and full digital activities. Modified activities that lead to full digital activities can eliminate settlements' local social and cultural activities. This is indicated by the disappearance of communal security activity in the function of the security post room, replaced with CCTV as an activity to monitor security. The security post room becomes a security control room.

Empirical results of behavior mapping analysis of factors that can maintain local activities of settlements found three aspects. These three aspects are the remaining of conventional social activities, the function of public spaces or shared spaces as a forum for conventional social activities, and both aspects encourage people to utilize technology towards economy and education instead of in the direction of replacing social spaces. Based on the space function point of view, the extensive use of public or shared spaces becomes a place for conventional activities has positive effects on society in which an area is still available to carry out those activities daily and monthly, from a small event to the bigger one such as religious and nationalist events.

The above research results provide input to the government and the community in developing digitalization

aspects in their community life. It is necessary to pay attention to modified activities to minimize the impact of activity changes brought about by digital progress. Modification of actions can make the loss of conventional activities (local social culture of settlements) and a function of space. In Kampung Cyber, this problem is followed up with hybrid

activities (offline and online) or moving conventional activities lost due to modification of activities to other spaces. Another thing that needs to be considered is to provide public spaces as shared rooms to become a forum for conventional activities of local social culture settlements.

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