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Factors Causing Visitor Vandalism in Functional Design City Parks Facility Products (Surabaya-Indonesia)

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Abstract

This study attempts to study how the design of City Park facility products can influence vandalism intentions. The method is carried out in two stages, namely observation of product damage and a qualitative survey of visitors and park managers. Researchers align the damage audit process through the product design functionality approach from Function-Behavior-Structure (FBS), namely the functional safety theory of a product design applied to the audit of three types of products, namely amenities, physical support, and aesthetics. This study was conducted in a comprehensive tropical city park in the city of Surabaya, namely the Surabaya Zoo (KBS) and the Bratang Surabaya Park. The results show that there is an influence of unsafe and functional design with the intention of visitor vandalism.

Keywords: *Management, Product Design, Functional, and City Park*

1. Introduction

[1] stated that the Green Open Space (GOS) tourist area in tropical cities is generally in the form of a Tropical City Park (TCP), which has an important function for the surrounding community to support various outdoor activities. [2], [3], [4] stated that TCP generally has various interesting features to support visitor activities such as various vegetation as a Cooling Zone Area and physical facilities in the form of Product Support Activity [5], [6], [7] explained that the availability of facilities and the environment can affect the flow of TCP visitor activities. The challenge for management to service TCP is increasingly important because visitor vandalism is

increasing, studies on TCP Indonesia [8], [9], [10], [11] also show an increasing level of visitor vandalism after the COVID-19 pandemic or after 2021 because people are increasingly visiting GOS but the security management of the facilities is lacking. [12] stated that facilities in TCP can be damaged, stained or broken due to visitor vandalism. Facility

Facility products are one of the important features of TCP [13], which can be used for individuals and social [14]. In terms of function, facility products are able to support various visitor activities [15]. [16] explain that facility products can be divided into three parts according to their functional value, namely amenities as public facilities, physical support as products that support physical activities, and aesthetics as garden decoration products.

Visitor activity towards TCP facilities can be influenced by functional factors of the facility but has not been clearly defined and can depend on the type of facility [17]. To prevent negative behavior and vandalism of visitors towards products, [18] explains that the functional security design of a product consists of components that are interconnected with each other as a functional form unit, these attributes can be the main function of the product (function), components that support the main function of the product (Behavior) and the related relationships between product components (Structure) or Function behavior-structure (FBS). [19] stated that FBS can further summarize the analysis in classical product design studies which consider more intuitively how the function of the product or system that is the subject where the design process phase is too technocentric and less directed at the aspect of product use. Anthropocentric studies such as FBS as aspects of product comfort and safety are still rarely used. [20] stated that FBS is also considered superior to several previous security design theories utilizing functional requirements and other separate design parameters.

Therefore, management needs to see the problems or damage to the product facilities that arise due to visitor activities. This study analyzes the influence of functional safety design features of products carried out by TCP management on seating product facilities against visitor vandalism.

Park Vandalism Due to Poor Functional Management Factors of Facility Products [21] stated that poor management in the design of supporting facility products can lead to intentional or unintentional vandalism by visitors, therefore good management is needed to manage the design of facilities provided for visitors and design factors are important for the implementation of safe

and comfortable park management. [22] added that poor management factors in the design of unsafe and unkempt facility products cause negative behavior.

[23] Continuing that vandalism or negative visitor behavior can be caused by functional factors in the design of facilities that are not functioning optimally. [24] continued that facility products that are less functional as supporters of activities, supporters of entertainment and recreation values and lack of functional design can reduce visitor satisfaction, thereby increasing negative behavior or vandalism. Based on the review above, a management strategy is also needed to prevent injuries to users through safe design management in facilities so as to reduce the impact of negative visitor behavior. The problem in this research is how FBS influences product facility design products on the intention of bad behavior or vandalism of park visitors. This study aims to determine the causes and types of vandalism carried out by visitors to city park facilities based on FBS and to determine The main components of FBS product facilities cause bad behavior of visitors.

2. Method

facility security design using a security theory approach to the functional design of facilities with FBS. The data collection method and the mechanism used to interpret the data is to use the observation method on the subject and visitor behavior or called focused ethnography on the types of park facility products based on [25] which states that this type of method, researchers can limit the focus of observation to certain aspects or phenomena in certain subjects or environments. For example, researchers can focus on social interaction patterns in the location area, changes in the research subject system, or the influence of security attributes on visitor behavior.

The main goal is to gain a deeper understanding of the phenomenon. Research attributes using a theoretical approach Function-Behavior-Structure (FBS). (FBS) according to [26] based on the development of the basic theory of FBS from The Function- Behaviour-Structure Framework by [27] is a framework used in systems engineering to analyze and design complex systems. This framework combines three main elements: function, behavior, and structure of the system.

1. Function: Function refers to the primary purpose or task of a product or system. It answers the question “what should the product do?” Product function is usually related to the performance of the product, such as producing a desired output or achieving a specific goal.

2. Behavior: Behavior refers to the way a product's operating system or responds to user actions. It answers the question "how does the system work?" System behavior involves interacting with input, processing information, and producing appropriate output.
3. Structure: Structure refers to the components of a product and the relationships between those components. It answers the question “how do the components relate to each other?” Product structure involves modeling the components, relationships, and physical or logical layout of the product elements.

In the FBS framework, system analysis and design are done by understanding and combining these three elements. The system's functions and behaviors are used as a guide to designing the right structure, while the system's structure can influence the desired functions and behaviors.

Data Collection

Data collection consisted of two main components: field observations and semi-structured qualitative interviews [28]. Observations were developed from post-visit content and photographs of priority seating facilities that were most affected by damage or signs of vandalism and frequently used by park visitors. Interviews were conducted with lay people who had visited the park and used the facilities as well as interviews with park managers who could act as decision makers and park designers who were familiar with facility product issues [29], [30].

Each interview lasted from 20 minutes to 1 hour and was recorded or transcribed. To ensure that everything went smoothly, a question framework was developed before the semi-structured interviews were conducted based on the FBS attributes of park facility products that affect vandalism, but the exact order of questions and topics varied depending on the situation. The interviews were supplemented with photos of the facility, vandalism, and the condition of the area around the facility to facilitate respondents' understanding [31]. The score results from the interviews can be classified by Excel tabulation and interviews using the NVIVO 12 program.

City Park Selection Setting and Observation

The type of urban park used is the comprehensive park type [24], [32], and [33] mentioned comprehensive parks are rich in content, suitable for all types of outdoor activities, and provide a variety of recreational management and support services.

The comprehensive park type is Surabaya Zoo, dan Kebun Bibit Bratang, because this park is a popular park with a large area, located in the city center and diverse facilities and has unique characteristics.

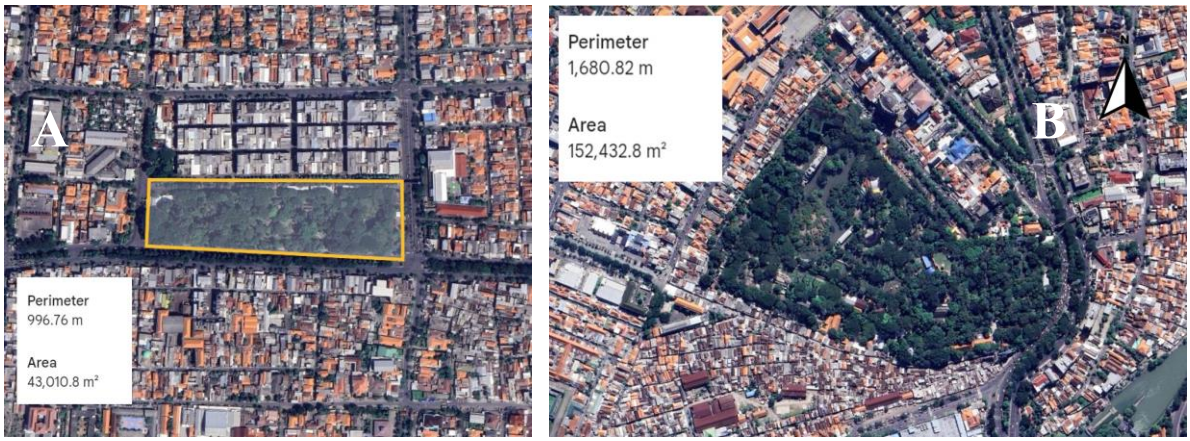

Figure 1. Comprehensive Park. (A) Bratang and (B) Zoo Park

3. Result and Discussion

Table 1: Participant Data

Characteristics of the Participants (n = 20).	
Age Mean	39
Minimum	21
Maximum	60
Sex, n (%)	20
Male	15 (75)
Female	5 (25)
Marital Status	
single	4 (20)
married	15 (75)
divorced	1 (5)
Education, n(%)	
Lower secondary school	0 (0)
Higher secondary school	2 (10)
University College	18 (90)
duration to the park, n(%)	
30–60 min (Low)	2 (10)
1 -2 hours (Medium)	6 (30)
> 2 hours (Long)	12 (60)
Usual frequency of park visits	

About 4–6 times per week	10 (50)
About once per week	4 (20)
About 2–3 times per month	2 (10)
About once per month	4 (20)
Status, n (%)	20 (100)
Visitors	10 (50)
Park Management	10 (50)

Reasons Why Visitors Come to the Park

Respondent visitors (n=10) who came to the park were the majority with a percentage of 90% coming together with other people. Visitors who came and did activities with family and children came from married visitors and other visitors who came with their friends came from single visitors and 10% came to the park alone. Visitors who came to the park with their friends tended to be younger than visitors who came with their families and children.

Causes of vandalism

Respondents mentioned that there are several reasons for the occurrence of functional product problems and other factors in park facilities that correlate with visitor vandalism. Respondents expressed the impact of facility problems that create negative impressions and behaviors of visitors when using park facilities. These factors have sub-factors that can differ based on the respondents' reasons.

Table 2. Park Facility Vandalism Factors

Correlated with vandalism		Not Correlated with vandalism	
Function	28	Function	12
interferes with activities	8	The Facilities have functional well	9
Facilities are damaged	14	The function of the facility can be	
The design does not match Expectations	6	known to visitors	3
Behavior	39	Behavior	1
Part of the facility interferes with	7	The facilities are still in good	
Activities		condition	1
Part of the facility was damaged	19		
The material facilities section is not good	11		
The Part Design section is confusing	5		
Structure	28	Structure	12

The facility structure is weathered and corrosive	21	The facility structure is still in good condition	6
Interferes with activities and is dangerous	7	The facility structure is still strong	4
		The structure of the facility does not interfere with activities	2

The results of the respondent interviews showed that the functional security problem factor in the facility product had a positive effect on visitor vandalism n=95 (79.2%). A total of 10 respondents from 3 answers for various types of products with a total of 28 respondents stated that functional problems in park facilities can affect vandalism, while 39 respondents stated that problematic behavioral factors can cause vandalism, and 28 respondents stated that can lead to vandalism. In the functional factor there are sub-factors that influence such as: disrupting activities and damaged facilities "Function can influence vandalism if the condition of the facility product does not meet visitor expectations."

Regarding the design not being as expected, this can be explained by visitors, namely "The function of the product can influence vandalism, when the product has a complicated component shape and becomes difficult for visitors to use." Meanwhile, in terms of behavior, there are several sub-factors in respondents' answers, such as the facility section disrupting activities." "Behavioral aspects of product components can influence vandalism, when there are parts of the product that are damaged, detached and dangerous when used, which can cause discomfort and improper use of the product. "Part of the facility is damaged "Behavior can influence vandalism if there are certain parts of the facility product that are problematic, such as dangerous component parts such as weathering, corrosion and sharpness", The material part of the facility is not good "Behavior can influence vandalism when the material parts of the facility product that are easily weathered and not strong have the potential to be damaged when the facility is not used properly and is exposed to heavier loads."

For the Structure factor, there are sub-factors such as the facility structure is weathered and corrosive. "The structure can be affected by vandalism if some of the structures on the product facilities have surface parts that peel off until they become sharp and disturb the users." Disrupting activities and causing harm "The structure can affect vandalism, the structure of the components connecting the backrest of the chair is not good, it is rotten and worn out so that it can injure visitors and make visitors disturbed and vent their anger or in the form of vandalism."

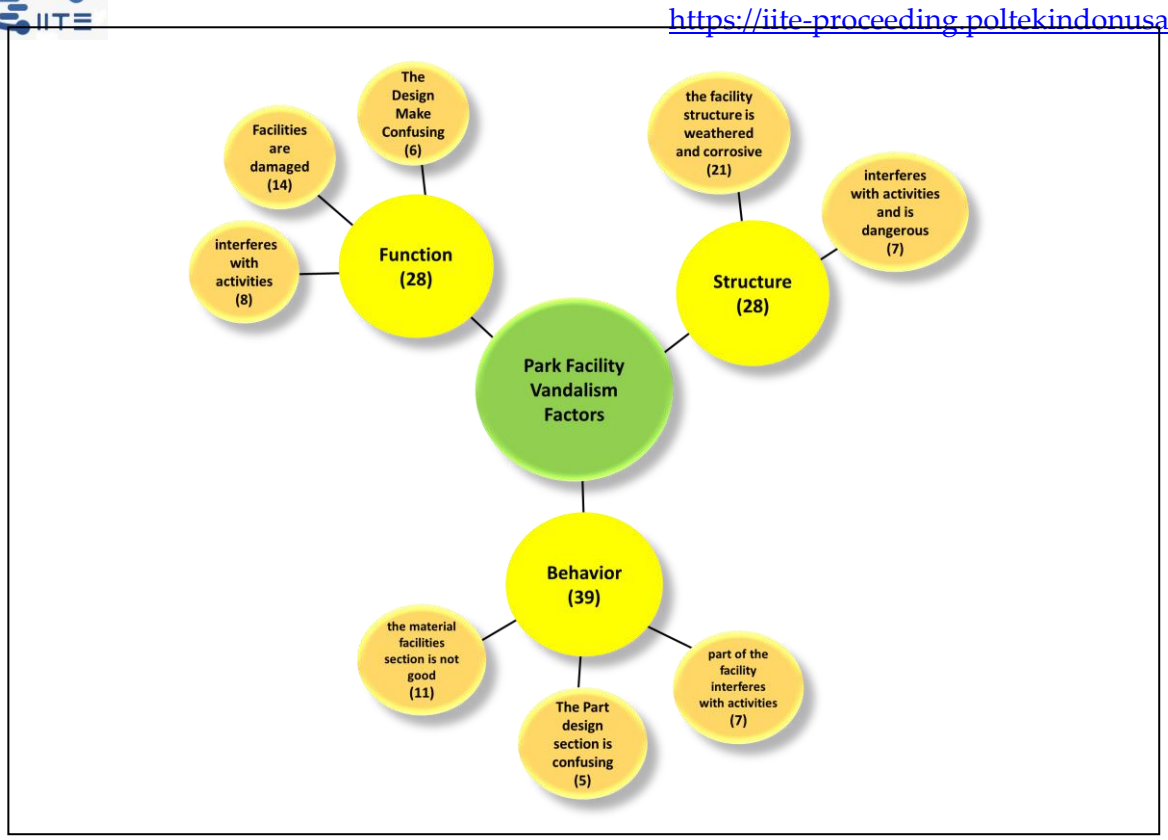

Figure 2. Factors and sub-factors causing vandalism..

Observation Results

Next, the researcher conducted observations on the causes of vandalism in facility products based on the categories of amenities, physical support, and amenities

Table 3. Problems with park facility products

Category	Product Facility	Type problem	Problems
Amenities	Trash Bin	Function	The design does not match Expectations
		Behavior	Part of the facility interferes with Activities
Physical	Seat Swing	Function	Facilities are damaged
Support		Behavior	Part of the facility was damaged
		Structure	structure is weathered and corrosive
Aesthetics	Fence	Function	Facilities are damaged
		Behavior	The material facilities section is not good
		Structure	The facility structure is weathered and corrosive

Based on the audit results from the tabulation measurements, it does show that there is an influence of FBS on park facility products. Facilities that experience The form of vandalism

received an above average problematic answer from the FBS attribute aspect, for example in the trashbin amenites product, some visitors committed vandalism in the form of littering because the design (function) was not as expected by visitors because the lid was difficult to open, causing visitors to have difficulty turning the lid (behavior), then behaviorally, the difficult way to open the trash lid (turn it) made visitors throw trash not inside but outside the trashbin and visitors' lack of understanding of the components of the trash can lid locking handle resulted in the trash can not being closed properly.

While in other products with the Aesthetics type such as fences that experience vandalism because (function) the fence is damaged and corroded and the material used is weathered (behavior). So the fence is easily damaged when visitors use it to lean on. while in the physical support product on the swing chair there are several causes of visitors becoming uncomfortable and committing vandalism such as in (function) is facilities are damaged, then in (behavior) is part of the facility was damaged, and (structure) is weathered and corrosive

Figure 3: Problems with Amenities products

Figure 4: Problems with aesthetic products

Figure 5: Problems with physical support products

3.1. Presenting the Results

This section contains answers to the questions "what have you found". Therefore, only representative results from the research are presented. What is meant by "representative results" are results that represent the research findings, which lead to the discussion. Generally, research results are presented in figures or tables, but can also be in the form of descriptions for certain cases.

Although, good figures and tables are interesting and easy to understand, but the most important thing is that the results / data presented in the figure or table are honest. If an image can only be understood with the support of research data which may require half or a full page of paper, then the data should be included as an appendix. Do not hide important data that raises reader questions or leads to mistrust of the reader.

The results section is written following the chronological order as presented in the method section. The important thing in presenting results is that the author must not include references in this section. This section is the "findings" of the author himself. However, if the results of the study are presented in a figure or table that directly compares with the findings of another person, the part of the figure or table must include the findings of that other person, without the need to discuss it in this section.

4. Conclusion

This article provides an overview of the audit of the design of city park facility products by considering the functional design aspect. The results obtained correlate with the causes of visitor vandalism due to confusion and dissatisfaction when using facilities based on function, behavior, structure. These results are important for park managers or for park designers and managers to be able to consider the sustainability of services to visitors by considering the functional design of facility products. This study has a deficiency, namely the lack of comprehensiveness of the test measurement tools used, although researchers have used qualitative measurement tools that can still provide in-depth results.

However, researchers hope that future studies can use more quantitative measurement tools with better statistics and more respondents so that the results obtained are more credible. Furthermore, it is hoped that future research will develop methods related to functional design

with other methods that have been developed from various aspects and collaborated with other methods so that research can provide more comprehensive results in providing more diverse results and location areas can also produce different results in research.

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