Designing adaptive reuse strategy for the ex-Deli Tobacco hospital in Medan, North Sumatra

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Abstract. In Medan, there are many buildings with high historical value abandoned. Ex-Deli Tobacco hospital is one of them. It was built in 1885 by Deli Maatschappij, a tobacco plantation pioneer company on Deli land. It is the first modern hospital in Sumatra, located in the heart of the city. This study aims to develop the design concept of the adaptive reuse of ex-Deli Tobacco hospital through a comprehensive approach, site survey, and interview with observers/activists of cultural heritage. Based on the analysis in the relation of structure and space of the city, as well as its site area (about 3.8 ha), the change of use into mix-use function concept becomes the best choice, by combining several functions such as restaurant/café/food court, office/co-working space, museum, and open green space. The old building is conserved based on its significance level. Besides, the new use recommended integrating with the Deli River revitalization concept, which contains a significant historical value in the development of the Medan city. The application of riverside as open green space integrated with the mix-use function, using the theme of sustainable architecture, will bring nature, the past, and the present together in one area.

1. Introduction
Urban cultural heritage is a source of social togetherness, diversity, a driver of creativity, innovation, and urban regeneration. Deli Tobacco General Hospital (DTGH) is one of the historically high historical buildings in Medan City, which was built in 1885 by Deli Company (Deli Maatschappij). The ex-DTGH is located at Putri Hijau Street (formerly named Laboehan street), West Medan District, Medan City, North Sumatra, Indonesia [1]. It was listed as the local heritage on the Mayor Decree Number 188.342/3017/SK/2000. It was listed as the local heritage on the Mayor Decree Number 188.342/3017/SK/2000. The hospital was last managed by one of the national plantation companies, namely PT. Perkebunan Nusantara 2 (PTPN2). Since the 1st of January 2011, it has been closed and stopped to serve general patients. There was one building that still operates as a clinic serving staffs of the company until the end of 2019. Currently, the DTGH has experienced the climatic deterioration process that affects the physical state of various structural and functional components of buildings. Therefore, it needs to revitalize it by considering the obsolescence of DTGH. According to Langston [2], the obsolescence of the historical buildings included physical, economic, functional, social, technology, and legal aspect. For the reasons, the revitalization of DTGH needs strategies comprehensively by considering those aspects to help in improving the city's ability to sustainably and responsively energy and natural resources.
In line with Langston, Lehmann attributes the adaptive-reuse of old buildings to sustainability; there may be significant positive environmental and social impacts from the conversion of existing buildings beyond the sole heritage value. Lehmann further outlined that adaptive-reuse design durability includes the ability to meet the changing needs of users over time, emerging economic and complexity factors, and the "loose" ability to integrate new technologies [3]. Also, conserving the old buildings aims to revive the internal strength of a community to renew itself by reconnecting with the past in its unique way, which is an essential thing for such renewal. This policy concerns with improving a whole area and raising its economic and social level through bringing historic buildings back into use and with integrating the historical part of the urban environment with the modern area [4]. In similar, Othman and Elsaay state that reusing heritage buildings with space and structure adjustments to the original building to match the new function can support and motivate tourism and community awareness of the heritage site [5]. In short, if handled properly, adaptive reuse as the reuse, natural, and regional environment that connected with recreational values, including self-growth, health, and social will serve as catalysts for socio-economic development through tourism, trade, and higher-value land and property. Thus providing income to pay for maintenance, restoration, and rehabilitation costs [6,7].

The site of the ex-DTGH is directly adjacent to the Deli River. In the past, the river had a central role as a transport road for Medan and contributed to trade during the early development of the Deli kingdom and plantation industry [8]. In addition to being a transportation line, the river initially also had clear water and lush vegetation on its riverbank. Deli river today faces complex problems such as the low quality of water, highly populated urban residential area with low quality and poor condition so that the area around the river to become slum area. According to a news article from CNN Indonesia, the Government of North Sumatra Province plans to build a 30.97-kilometre inner city-toll road in Medan over the Deli River targeted for completion in 2023 [9]. Indeed, this issue is a concern and consideration in the revitalization of this ex-DTGH. Thus, this research aims to develop adaptive-reuse concepts and strategy of the ex-DTGH through a field survey and interviews with the local communities from various professional backgrounds who are interested in the heritage conservation.

2. Methods
The data collection of the study started from compiling old sources about the history of DTGH followed by documenting and identifying the damage through field survey. Heritage significance assessment was carried out after documentation and historical investigation. The next step of the study involved ten informants in the interview process using a semi-structure interview type. The informants are from various professions like architects, historians, archaeologists, then some of them are residents, landowners, and potential project investors. The questions focused on the significance of the DTGH and the prospect of its new use. The content analyses are performed according to the steps of the study.

3. Results and discussion
The ex-DTGH formerly known as Deli Maatschappij (DM) hospital began to be discussed in 1871 since the company brought a foreign doctor, H. Sanders Eza, to Deli [1]. About 1874, the company built a simple hospital focused on providing a health service particularly about 1874, the company built a simple hospital focused on providing a health service, particularly for the European who are managers of plantations. Eight years later, the Netherland East Indies Government issued the Koeli Ordonantie, a regulation governing contract labour relations in East Sumatra, one of which is the provision of health facilities for contract coolies. Then around 1885, the hospital was established, it served for the labourer’s health as well. This hospital consisted of four wards and a main building [10]. In the early 20th century, Mr Ingerman, General Manager of DM for that period, renovated the hospital with more modern facilities like providing X-ray and laboratory. The hospital had eight rooms in the area of 1 Ha with five trained nurses and funded by 39 companies, included German and Swiss clubs. A few years later, the "Koeli Ordinante" was reviewed, and in its revision requiring the plantations company to provide a free health care service for labourers. In 1915, the DM Hospital selected to become a tropical disease laboratory hospital. Then around the 1930s, the hospital has a significant renovation. After Indonesian
independence, the hospital experienced renovations in 1959, 1963, 1989, the 1990s, and 2000. The name of DM hospital changed many times according to the development of the plantation company organization and eventually had locally known as Deli Tobacco General Hospital under the management of PTPN 2 [11].

In general, all buildings are in a state of deterioration and degradation. The condition is getting worse due to vandalism. From the observations shown, most of the buildings has been renovated for both interior and exterior. Those changes have impacted their integrity and authenticity decreasing. The layout and number of facilities in the site as well the chronology of hospital development shown in the following Figures 1 and 2. This highlights the buildings are diverse in term of architectural style, starting with the use of late 19th-century architecture and until the last building built in 2000 using a collection of contemporary modern architecture. The VIP building, built in the late 19th century, was designed in Indische Style that is the dominant eclectic (neoclassical), while the main-building built around 1930 using the colonial tropical architectural style.

Figure 1. The block plan of the former DTGH [11].

Figure 2. The chronological development of the buildings [11].

In contemporary conservation theory, the identification of the significance or value of a historical asset is fundamental to heritage conservation [12]. The concept of development and preservation of heritage building during the past decades that based on its value known as the values-based management system involving all associated communities and stakeholders to develop the conservation strategies and policies [13,14]. The value assessment for the former Deli Tobacco Hospital has been carried out twice in July 2013 and September 2014 by using the assessment criteria developed by Fitri [15]. As a result, the ex-DTGH overall met the criteria i, ii, iii, iv, and v. Today, the number of whole buildings in the site is 31; thus, it needs assessment of each building components. Figure 3 shows the level of significance for the 31 buildings on site. The policies and action for conservation depending on its significance level, the priority to save and conserve the buildings especially given to that have special and high significance values.

Considering the potentialities of adaptive reuse for the ex-DTGH, the recommended new use is the mixed-used concept with Open Green Space. Mixed used with functions such as offices, cultural parks, and green open spaces are the appropriate choice to support the redevelopment of this area in the context of Medan city development by prioritizing social, cultural, economic, and environmental values. The use of part of the site as a cultural park socially and culturally can have a positive impact on activities such as art and cultural performances. Besides, the use of the complex as an office area complements the economic function that drives economic activity in Medan City—then integrated with the concept of the revitalization of the Deli River at the west of the site. Procurement of public spaces or green open spaces as utilization of riverfront areas is needed to support the increase in the percentage of green space in the city of Medan. Environmentally, this function supports saving the environment. This revitalization aims to be able to make local people aware of the vital role of the Deli River. Indeed, the discourse on toll projects announced by the Government is reminiscent of the case that happened to the
Cheonggyecheon River in South Korea. Above the river was used as a freeway in the 1940s. Like many of the world's underpasses, the area under the expressway has mainly become avoided by the public as it is considered a space full of criminal activity and illegal dumps. Then from 2002 to 2005, the Government restored the river area to a friendly public space and also enhanced Korea’s image worldwide. Learning from the case that occurred in Korea, the Medan City Government can make a better strategy for the revitalization of Deli River.

Figure 3. The significance level of the building components in site of the ex-DTGH [11].

Figure 4. Adapted structure for new function (Old maps source from Leiden Library University).

The legacy built through adaptive-reuse has new functions for several socially beneficial purposes, according to Yung, which is the most effective approach for self-financing and a sustainable form of conservation. In particular, extending the life of existing buildings through reuse can reduce the consumption of materials, transportation, and energy as well as pollution and thus make a significant contribution to the reduction and sustainability of low carbon [16]. Several other new proposed functions are museums, culinary delights, co-working spaces, offices, and also large open outdoor spaces. Thus, it can bring together the past, present, and nature in one design area. We can have past experiences through the existence of an old building that establishes in 1885. The incorporation of co-working space functions in the design represents the present concept. Development in technology has changed the working concept into infinite space or spaceless. Today many people who work have no limitation by physical spaces anymore. Co-working spaces are increasing the possibilities of meeting new people and collaborating. The river and large green open spaces in this design present nature amidst the hustle and bustle of the city of Medan. The lack of recreational green space in the city of Medan to visit makes the presence of rivers and green open spaces the address to this issue. The large green space can also transform into an outdoor event space.

A restaurant is one of the places that people like in big cities like Medan. Apart from being a place to hang out with friends or family, it is also a relaxed place to discuss things from studies to business matters. In terms of tourism in Medan, what is best known is its culinary delights. Therefore, it is better to include the culinary function in the revitalization design of the Ex-DTGH. It can attract tourists from outside the city and even abroad visit this area to experience the food of Medan while enjoying one of the historical buildings that still exist. One of the recommended design themes is the theme of sustainable architecture. According to the research about the relationship between adaptive reuse to the 3Es of sustainability, adaptive reuse can reduce the number of greenhouse gases (GHGs) produced by buildings [17]. Some of its applications, namely, using natural ventilation, water recycling, green roofs, water infiltration, and natural lighting. Learning from the former landscape concept of the ex-DTGH, it is found, as shown in Figure 4, the layout of the circulation path formed a semicircle as pictured in the old maps of 1913 and 1925. It is one element categorized as a structure in heritage that has important
significance to be conserved and adapted. Regarding the waste pool of the hospital Waste Water Treatment Plant (WWTP), which is located right behind the Laundry building, it needs further investigation to identify its condition. If its part is still useful, it can be converted into an area for filters and water storage or ground water tanks.

The development of the Deli Tobacco Hospital has broad potentialities. There are several reasons for its safeguard and conservation, including:

- The location of the ex-DTGH is very strategic with an area about 3.8 Ha. Besides, it is very close to the heart of Medan with a high economic value. Today, some new building like a 5-star hotel, supermall, and several high-rise buildings have been constructed and impacted to the changing of historical character. Local Regulation Number 2 the Year 2015 concerning Detailed Spatial Plan of the town states that the land use function of this area is for office [18].
- The ex-DTGH has contributed to the historic character area. It is possible to conserve it by strengthening of its historical value as the first modern hospital in Sumatra so that the physical traces of the DTGH can treat the collective memory of the community that will be able to bind with the following generations in the future.
- According to the current condition, around 60% are possible to be safeguarded, even though it has started to deteriorate. The building structures built in the Dutch Colonial era are well known for their excellent quality and durability.
- The site has a large area and adjacent to the Deli river. Because of Medan city is a lack of community facilities so that this location is very suitable as green open space as well as a historical center and even a health center for learning, socializing citizens, and becoming a historical public space for the region.
- The hospital business is the best-selling business in Indonesia, also Medan, the hospital stands like mushrooms in the rainy season. Therefore, this highlights to redevelop the ex-DTGH into a tropical disease hospital completed with a more sophisticated laboratory so that the ex-DTGH could lead back into being a center for tropical disease research in Sumatra Island.

From the results of interviews with the informants, nine of ten respondents argued for the adaptive reuse of the former DTGH. Some of the appropriate new functions based on respondents’ views are offices, museums, community centers, restaurants/cafes, and conference halls. According to them, the strategy for conserving the ex-DTGH depends on their significance and existing condition. All respondents agreed that the Deli River that borders the area is also a potential and significant point in revitalizing. Therefore, it can create a good design, which is sensitive and responsive to the site where it stands.

4. Conclusion
The ex-Deli Tobacco General Hospital is a local heritage of Medan having high significance and urge to be conserved. In developing this hospital building, the concept needs to be a concern for its values. Based on observations and interviews, as well as the analysis of the regulations, the adaptive reuse of the former DTGH would be better to implement a mix-use concept. The utilization of the complex as an office area complements the economic function that drives economic activity in Medan. The arrangement should integrate the former DTGH complex should consider with the concept of the revitalization of the Deli River bordering the site on the westside. The renewal held expected to uses a theme that to be a link between the existence of the river and the former complex of Deli Tobacco Hospital. Based on one of the government strategies in advancing local business and tourism so far is to build a facility capable of attracting the interest of the public both from within the country and abroad. The location of the former DTGH is very strategic in terms of proximity to the city center, supporting facilities around it, the potential of the land is large enough. Also, it recommends the new functions should also take into account the tourism aspect. One of the attractiveness of the Medan city so far that is quite supportive of the local economy in terms of tourism is local culinary. In conservation, deconstruction or additions buildings within the heritage area must have a consultation with conservationists and construction engineers. It is considering the old building structure using a shallow
foundation and its location bordering the river so that it is not allowed to have basement construction due to the dewatering process considered to be harmful to the structure of the building. Using heavy equipment in the process of building new constructions is not recommended. Before development planning, owners or consultants should conduct the Heritage Impact Assessment (HIA) so that it can know the influence of development on heritage buildings in general.

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