Review

Urban Heritage Facility Management: A Scoping Review

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Abstract: This review examines current discussions from the cross-section study between urban heritage conservation and urban facility management fields in the academic literature from 2011–2020. The purpose is to identify the gaps within the examined papers to reveal the challenges and opportunities in the combined fields using the United Nations Educational, Scientific, and Cultural Organization (UNESCO)'s recommendation of the historic urban landscape (HUL) approach. The scoping review procedure was followed. The six critical steps and four supporting tools of the HUL approach were used to analyze the examined papers. Most aspects of urban heritage management within the body of literature were directly related to urban-scale facility management. The potential usage of building information modelling became one of the most discussed technological aspects. The expansion of the public–private partnership model into the public–private–people partnership is considered as a new potential business model. At the same time, the adaptive reuse approach is deemed to be the most sustainable method of managing heritage areas. This scoping review identified the financial tools as the most under-researched urban heritage facility management component. Therefore, it needs to be endorsed among the scientific communities to improve the knowledge and provide operable guidelines for the authorities and practitioners in the urban heritage field.

Keywords: facility management (FM); urban FM; urban heritage; conservation; the HUL approach

1. Introduction

During the 20th century, over 30 normative manuals and guidelines for preserving and maintaining cultural heritage have been provided by the United Nations Educational, Scientific, and Cultural Organization (UNESCO) [1]. Since the expansion of its spectrum, after simply concentrating on monuments and historic centers to a more cultural heritage orientation in the early 21st century, the horizon of cultural heritage was applied to urban areas and communities as living heritages [1–3]. Broadening the term "heritage" has contributed to a comprehensive qualitative view of urban heritage that incorporates the values of the urban landscape [3,4]. A landscape is being described as a living territory, a socio-cultural concept, and a subjective mental picture of the changing environment in space and time [5–8], as cited in [1]. The HUL, which gives an extensive perspective of urban heritage, provides a framework for the implementation of an integrated value-based landscape strategy for cultural heritage management that is similar to the notion of community-based facility management, a predecessor to the urban facility management discipline [1,9]. Therefore, UNESCO's latest approach to carefully managing urban heritage areas has finally married facility management (FM) and urban facility management (urban FM) principles to achieve sustainable development of historical sites [9]. The heritage authority should handle the maintenance of urban heritage facilities and infrastructure appropriately [10,11]. The implementation strategy must carefully consider what needs to be preserved, why, and how to implement it to maintain authenticity and the visual quality of the cultural heritage area [11]. The protection of historical areas can be viewed as a complex form of adaptation, maintenance, and conservation of cultural significance [12].

Currently, urban FM is expanding community-based facilities management by providing a forum for authorities, organizations, and businesses in new and creative environments to support local stakeholders [13]. The fundamental concept of urban FM is to improve the influence of FM on the urban environment and to ensure the implementation of sustainable development goals through a service-oriented perspective that supports livability requirements and social values, community inclusiveness, and well-being approaches [14] that are more than just the operation and management of the city infrastructures. The urban FM strategy tackles the issues by functioning as a bridge between various stakeholder interests in the urban areas and ensuring that social value is integrated with environmental and financial consideration [14]. Lindkvist et al. [15] highlighted the need for FM to develop further within urban areas. It is supported by Nielsen [16] who referred to urban development as being among the nine categories where sustainable facilities management (SFM) is considered. SFM is a growing concept within the FM discipline that intends to promote high building-performance and safety, minimal resource consumption, and reduced greenhouse gas emissions production, as well as other climate change adaptive responses which includes energy conservation, waste and recycling management, safety and health management, and minimalization of water and carbon footprints [17].

Furthermore, Salaj et al. [13] extended the prospects of the urban FM field in becoming a dynamic sponsor in enhancing sustainable living spaces, focusing on healthiness and well-being. FM could incorporate diverse mechanisms for managing heritage protection by resolving changes in utilization, changes in the environment, multiple participants, and overlapping requests for sustainable necessities [10]. Managing historic urban areas has evolved from a tangible method to a holistic one within almost the same period. In the urban context, the historic urban landscape (HUL) approach supports this landscape-based approach [3,18].

However, both urban FM and the HUL approach have remained under-researched aspects of FM and conservation. Therefore, a study to bridge the urban scale heritage conservation and urban FM to gain a holistic understanding is urgently required. The combined field between urban heritage management and urban FM in this article is being introduced as urban heritage facility management (UHFM). UHFM is a new term being proposed as part of the results and not currently used in the domain. This study addresses the problem by assessing these three research questions:

(RQ1)　How is urban heritage conservation related to urban FM?
(RQ2)　What are the dimensions of UHFM in the body of literature?
(RQ3)　How can HUL supporting tools related to urban FM be placed within the critical steps of the HUL approach?

This article examines the current discussions, what is already known, and what is not from the cross-section study between urban heritage management and urban FM fields in the academic works of literature using a scoping review process. This scoping review aims to provide key elements of UHFM by identifying the current academic discussions on FM practices within the urban heritage area from 2011–2020 to reveal the challenges and opportunities within the combined fields. This study also attempts to provide a clearer view and operable criteria to managing the facilities of historic districts by analyzing the HUL critical steps and supporting tools recommended by UNESCO.

2. Theoretical Framework

The main ambition of this chapter is to outline key features of the two theoretical fields, urban heritage management and urban FM, in order to establish a vocabulary necessary to grasp the challenges involved. This vocabulary will in turn serve as the basis for the scoping literature review, and will structure the presentation of the results.

2.1. Urban Facility Management (Urban FM)

The main concept of urban FM is to increase the efficiency of the tangible infrastructure, build employment openings, and safeguard neighborhood inclusiveness in the operation

of facilities of the city [14]. The deterioration of physical space is linked to the lack of local inhabitants' self-organization, leading to conflicts between social classes (among people) and between people and governments or between dwellers and other institutions [19]. Integrating FM with community facilities might solve the escalating operational costs and negligence from facilities services providers. Since non-technical elements, such as public participation, neighborhood self-organization, well-being, etc., are more disruptive in the built environment, projects that fulfilled technical criteria, such as building codes, heritage conservation codes, city planning and masterplanning etc., but did not meet livability requirements were more prevalent [20]. Therefore, Salaj [21] argued that engaging with communities using a value-driven strategy may result in a shared motivation to find solutions that fulfill the community's needs, as well as a link to long-term objectives and commercial possibilities. Although public–private–people partnership (PPPP) is still under-researched, it is a potential new business model that seeks comprehensive connections with all stakeholders [22] to enhance public–private partnership (PPP) approach. The discipline of FM is developing into a more complicated subject of urban FM by responding to communities' needs and creating a coordinating body between people, public, and private sectors. Urban FM provides integrated deliveries, e.g., customizable solutions, flexible and well-maintained structures, outdoor activities and services, and various socio-technical solutions [14]. The focus of urban FM is to increase well-being, especially looking at how to deal with an extensive array of challenges, such as environmental hazards [23], social safety [24], resilience [25], and health [26], particularly for women, older adults, and youth. From a design and accessibility point of view, spatial interventions are essential to improve citizens' health and well-being [27]. Still, the approaches primarily focus on a local level context, limiting their broader impact on society. In particular, exploring the possibilities of stimulating a healthy environment as an opportunity to mitigate the effects of people needing care through changing circumstances has been considered in the workplace context [28]. Through urban FM, it is possible for this learning to be transferred to the neighborhood level.

2.2. The Historic Urban Landscape (HUL) Approach

The latest UNESCO guideline on the HUL approach [18,29] promotes a landscape-based strategy at the international level. National and local governments must enact, disseminate, promote, and track its implementations. Authorities are urged to redevelop instruments and tools responsive to local principles and needs related to the HUL critical steps which are (1) mapping resources; (2) reaching consensus; (3) assessing the vulnerabilities; (4) integrating urban heritage values and vulnerabilities, (5) prioritizing actions, and (6) establishing partnership and local management frameworks [12]. The new philosophy on managing heritage areas describes urban heritage management as "managing the thoughtful transition", thus it proposes a holistic strategy to managing historic sites [12,30,31]. The concept of heritage management has developed from a tangible method towards a more holistic framework that incorporates intangible values, attributes, and sustainable urban gentrifications, followed by a more critical analysis of urban historic social and economic roles. The strategy is referred to as the urban landscape method [11]. There are also four supporting tools for the HUL approach, which are (1) civic engagement tools; (2) financial tools; (3) regulatory systems, and (4) knowledge and planning tools [12]. For every critical step of the HUL approach, these four tools are involved in various forms to support it in diverse proportions according to each specific case.

2.3. Interaction between Urban FM and the HUL Approach

The role of FM in historical urban development is infrequently studied, and its contribution to sustaining the operation of heritage buildings is sometimes problematic. Most studies stated that FM was mainly related to supporting core activities within a single-owned building(s) [9,32–39]. In fact, FM could be understood from a broader perspective [40], for example, understanding FM from urban scale viewpoints. FM is a branch of

the management discipline that addresses the tools and services that support the functionality, safety, and sustainability of buildings, grounds, infrastructures, and real estate [41]. The International Facility Management Association (IFMA) also proposes a new definition of FM: "Facility Management is a profession/discipline that encompasses multiple disciplines to ensure the functionality of the built environment, by integrating people, place, process, and technology". This new definition allowed urban FM to legitimately become an expansion of the FM discipline since urban FM is a manifestation of an urban scale facility management. This study pinpointed the prospect of urban FM to perform in a more expansive setting, especially urban heritage, as argued by Salaj [13] in terms of extending the possibility of the role of urban FM to develop itself as an involving collaborator in promoting living areas and emphasizing health and well-being.

In terms of cultural heritage management, FM is known to be a discipline focusing on property. FM can be described to have originated from the convergence of three key fields of practice, including land management, property maintenance, and office administration [42]. This notion should be applied to a broader viewpoint, both tangible and intangible, following the 2011 HUL Recommendation by UNESCO in managing urban heritage sites [10].

Similar to the HUL approach, Salaj et al. [20] explained that through establishing solid relationships with residents, urban FM would be able to develop inclusive governing, efficiency, co-financing, co-ownership, and co-creation of urban public spaces to enhance people's participation, engagement, confidence, equality, and cohesion. Enhancement of citizens' participation in governing and development processes is important for the higher achievement of SDGs [43]. From that perspective, co-financing is in line with the public-private-people-partnership (PPPP) model [22], co-owning with the personal perception of responsibility and attachment to the public domain [44,45], and co-creation with the collaborative governance approach resulting in the creation of quality public spaces that contribute to people's well-being [46]. Urban FM stayed as an under-studied FM feature due to the multiple overlapping elements, including urban planning, urban gentrification, urban management, and urban sustainability [9,13,41,47].

Redevelopment in the built environment, particularly the urban historical area, is frequently concentrated on technical elements compared to its non-technical features [48]. Gentrification in urban areas must be closely monitored to grasp sustainable growth because of numerous social advancements. Strengthening people's awareness and demands of the environment is critical to increasing their desire for technological possibilities [14,48], an important component of FM.

2.4. Knowledge Gap

The previous subsections are theoretical explanations of FM and urban FM, the HUL approach, and interaction between the two fields, and represented the phase-zero and initial rapid analysis of the 76 examined papers using queries, text search, and word frequency tools provided by the qualitative analysis software to identify the potential knowledge gap. The preliminary scoping review process indicated a lack of an operable value-based approach within urban heritage facility management. Regional discourses on preservation and the complexities of managing heritage assets were not entirely contextualized. Local authorities often found it problematic to implement UNESCO's recommendation on HUL due to a lack of detailed local guidance. Urban FM could potentially bridge the gap in operationalizing a value-based approach concerning local policy and stakeholders by facilitating the shift from international standards to the contextualized municipal initiatives and strategies in managing historic districts.

Two systematic reviews [1,31] were also acknowledged as phase-zero works of literature, prior to the scoping review process, that enriched the study. Although considered valuable sources, both articles were not listed as examined papers in this scoping review due to the rigorous protocol of the scoping process. While the two articles, from Rey-Pérez [31] and Ginzarly [1] were conducting a systematic review solely from an historic

urban landscape (HUL) approach point of view, this scoping review was more (urban) FM oriented, aimed at providing vital elements of urban heritage facility management by identifying the current academic discussions on FM practices within the urban heritage area from 2011–2020 to reveal the challenges and opportunities within the combined fields.

3. Materials and Methods

3.1. Research Design

This study implemented a scoping review as the primary method for understanding and identifying the urban FM principles and the urban heritage conservation value. Levac [49] explained that a scoping literature review is a small-scale, detailed description of studies on a subject previously studied. A scoping review aims to remind readers of the essential information and ideas that have been created on the topic to compare, contrast, and relate the results found while evaluating the work of researchers [50]. This method helps both authors and readers to gain a sense of academic discussions. Within a study, a scoping review is frequently utilized as a groundwork aimed at a fresh understanding to recapitulate and extract others' opinions [49–51].

The scoping review seeks to quickly understand the key ideas, especially the complex topics [52]. This qualitative study is suitable for addressing the relationship between urban heritage management and urban FM principles. There have not been many works of literature that comprehensively discuss both fields simultaneously in such a manner. An urban heritage conservation viewpoint could potentially enrich and sharpen the urban FM perspective of managing historic towns or urban heritage precincts.

As proposed by Grant and Booth [53], and then by Arksey and O'Malley [52], a scoping review is an "assessment of potential size and scope of available research literature", aiming to identify the nature and the extent of research carried out within a field. As such, it bears no formal quality assessment of the research mapped.

This is in contrast with, for instance, systematic reviews, which "seek to systematically search for, appraise and synthesis research evidence, often adhering to guidelines on the conduct of a review." Correspondingly, still according to Grant and Booth [53], "such systematic reviews can use quality assessments as inclusion or exclusion criteria. Systematic reviews typically come up with recommendations for practice, while scoping reviews map the knowledge within a field, in order to be able to propose research agendas".

A scoping literature review is usually conducted according to a specific protocol to safeguard its reliability and replicability. The procedures used in this analysis were (1) describing the research problems; (2) searching for appropriate works of literature; (3) collecting articles; (4) charting the data, and (5) compiling, summarizing, and presenting the results [52].

The study aims to describe to what extent and how the cross-section of the urban FM and the HUL approach were operationalized through the literature and to propose key elements of urban heritage facility management (UHFM) extracted from the examined papers.

3.2. Searching Procedure

Following the protocol of the scoping review [52], the steps taken were (Figure 1):

1. Three research questions were defined.
2. After several trials and errors, an initial search of relevant studies was conducted using available scientific databases (Google Scholar, Science Direct, Web of Science, Scopus, and Oria) with the following search strings:

    - ("Facility management" OR "facilities management") AND ("urban heritage" OR "urban conservation");
    - ("Urban facility management" OR "urban facilities management") OR ("urban FM") AND (heritage OR conservation);
    - ("Historic urban landscape") AND ("facility management" OR "facilities management").

3. At first, no limitations were put on the initial search. From the preliminary investigation, it was evident that the number of results using Google Scholar within the keyword of "urban facility management" (316) and "urban facilities management" (175) was manageable. It showed that 64.36% of the body of literature on urban FM used the American term of FM (facility management) instead of the British (facilities management).

4. When an OR operator was added ("urban facility management" OR "urban facilities management"), the search resulted in 364 references, indicating that 48 references were using both the US and UK's terms of urban FM.

5. "Urban FM" provided 581 hits, but ("urban FM"–radio) showed 460 results, meaning that 20.83% of the result was a radio-related term of FMs.

6. The search-string ("urban facility management" OR "urban facilities management" OR "urban FM") yielded 996 references, while ("urban facility management" OR "urban facilities management" OR "urban FM"-radio) hit 809 references.

7. After the search was limited only to journals and to those between 2011 and 2020, the number of results decreased significantly. The year 2011 was chosen because UNESCO started the recommendation of the HUL approach in that year.

8. After all PDF files of examined papers were collected and their attributes checked by reference manager software (Mendeley), they were exported into a qualitative data analysis software under a folder named "examined papers" for further analysis.

9. The publications were then saved and loaded into the QDAS, NVivo12 Pro, to perform the necessary investigation.
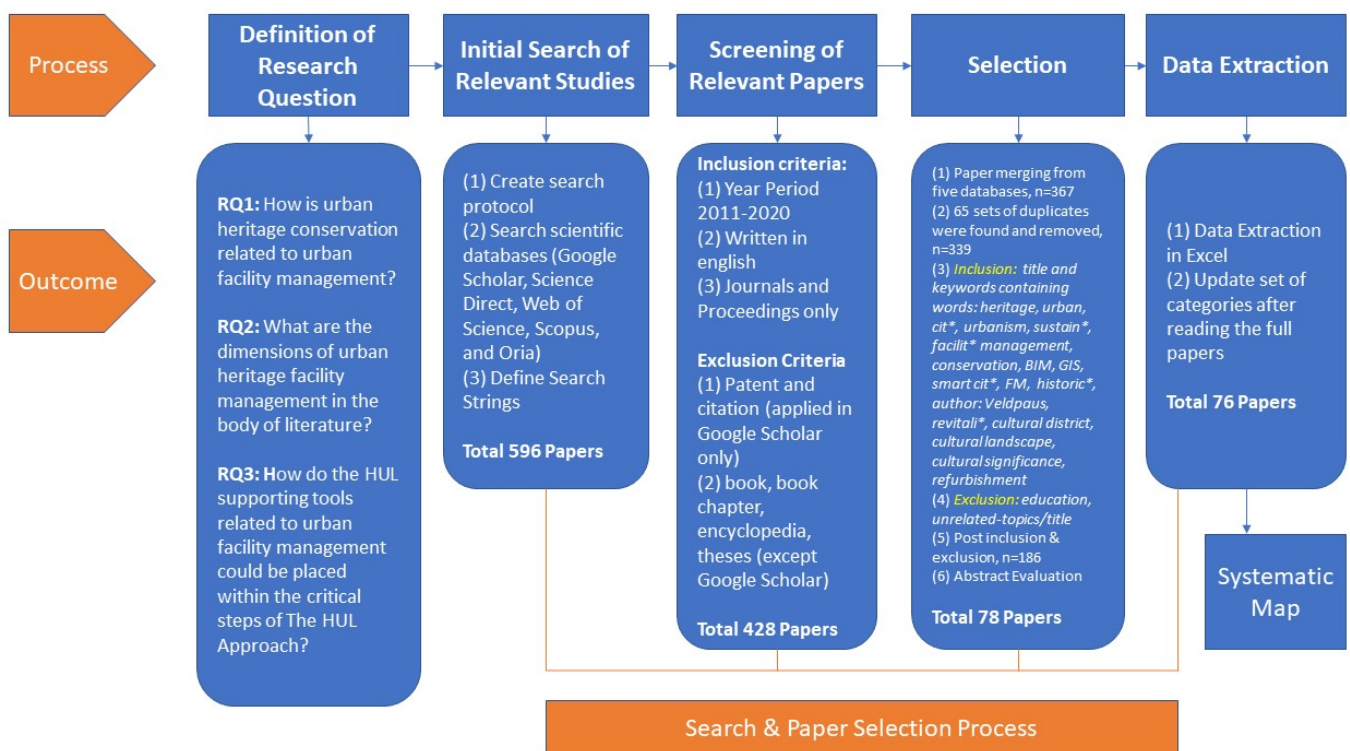

Figure 1. Scoping review process; source: author analysis.

3.3. Categorization

Based on the HUL's six critical steps (mapping resources, reaching consensus, assessing vulnerabilities, integrating values and vulnerabilities, prioritizing actions, and establishing local partnerships and frameworks), the body of literature was then coded into categorization. For each critical step, a further categorization was then implemented by

assessing the 76 examined papers based on the four supporting tools of the HUL approach: civic engagement tools, financial tools, regulatory systems, and knowledge and planning tools. These four HUL supporting tools are the acknowledged tools in the conservation field recommended by the UNESCO, to adapt this new international instrument to local contexts and to facilitate its implementation [1]. National and local authorities are stimulated to (re)develop these tools to meet the local values and needs [11].

3.4. Limitation

The examined papers were based only on English-written literature without including grey literature such as thesis, publicly accessed documents, reports, etc., between 2011 and 2020.

4. Results

4.1. Descriptive Result

4.1.1. Number of Publications

In general, the number of publications related to UHFM using a scoping review protocol from 2011–2020 increased through the year (Figure 2). Between 2011, when the HUL approach was introduced, up to 2017, the number of publications was stable, between four to eight articles each year, with a minor drop in 2012 and 2017, which were compensated for in 2013 and 2016. A significant increase of 100% in 2018, compared to 2016, was identified from the examined papers. The trend continued to steady within the next two years by 15 articles in 2019 and 2020 when the COVID-19 pandemic started and reached its peak worldwide.
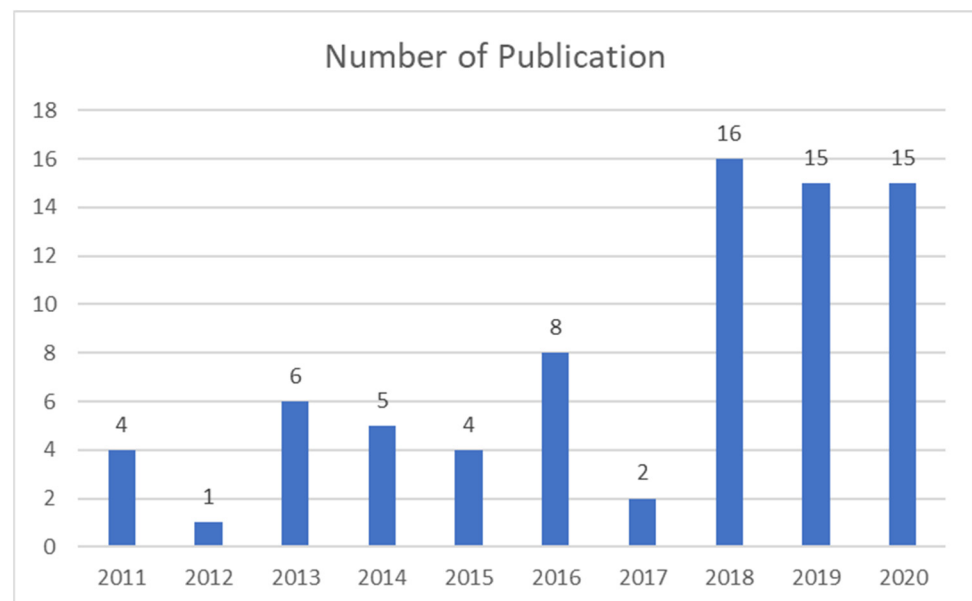
Figure 2. The number of publication trends from 2011–2020.

The relatively small number of articles per year indicated that the discussion of the combined field between urban heritage conservation and urban FM was not widely examined, therefore becoming an opportunity to study further.

4.1.2. Top Authors in the Field

Among the list of authors of the 76 examined papers, a simple analysis was conducted to figure out the most active authors in the field. The analysis extracted two names from the heritage conservation discipline (Loes Veldpaus and Ana Pereira Roders) and one name from the urban FM field (Alenka Temeljotov Salaj). The latter accounted for nearly 7% of the articles with five publications, both as corresponding author and co-author. Veldpaus

and Roders' articles combined accounted for almost 15% of the selected articles. Other authors were identified with less than three articles than the main author from the list (Figure 3).
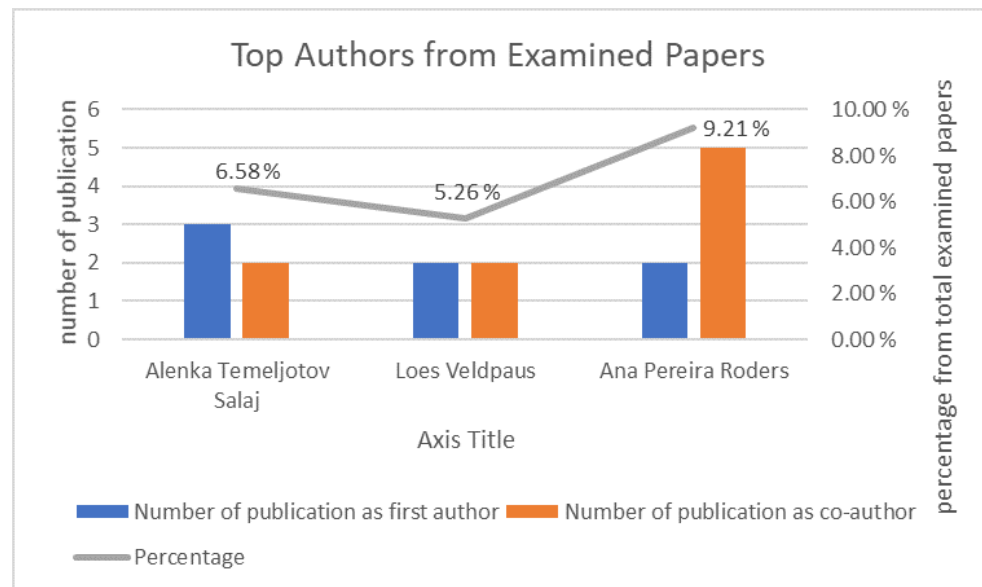

Figure 3. Top authors on urban heritage facility management (UHFM) field.

4.1.3. Top Journals of Urban Heritage Facility Management Articles

　　Ten journals were repeatedly used to publish articles regarding UHFM, with a total publication of 32 articles (42.11%). *Facilities* was the most active journal to publish the desired articles for this scoping review with nine publications (11.84%), mostly with articles concerning FM and urban FM (Figure 4). Writings on the heritage conservation field were primarily published in the *Journal of Cultural Heritage Management and Sustainable Development* (JCHMSD) with four articles, the same number as *Sustainability*, an open access journal from MDPI. *Environment-Behaviour Proceeding Journal* contributed three articles to the examined papers within the nine years from 2011–2020. *Places and Technologies*, *Copernicus Publication*, *The Journal of the Malaysian Institute of Planners* (Journal of MIP), *Automation in Construction*, *Institute of Physics Publishing (IOP) Conference Series*, and the *Journal of Cultural Heritage* together represented 15.79% of the works of literature. The remaining 44 articles were published in other journals and conference proceedings with only one article each.
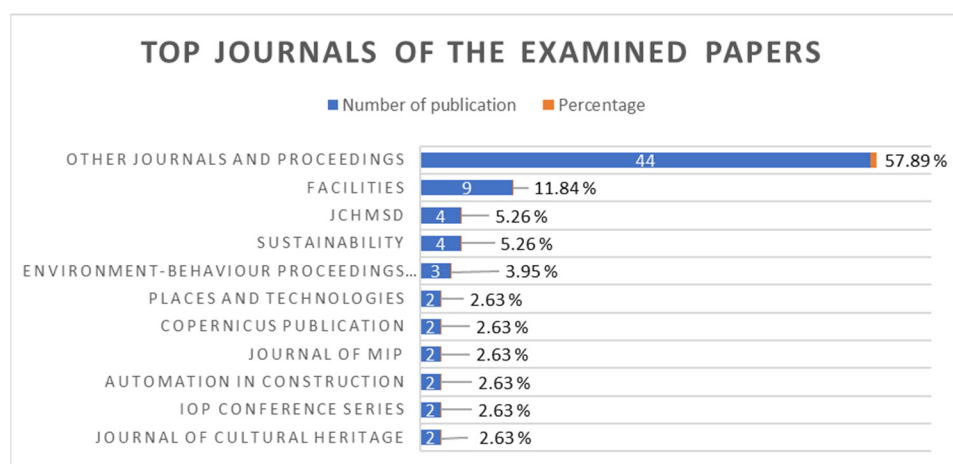

Figure 4. Top journals of UHFM-related articles.

Emerald Group Ltd. published almost a quarter of the examined papers, while Elsevier Group (18.42%) and Multidisciplinary Digital Publishing Institute (MDPI) (6.58%) published another quarter. Springer contributed three papers, while e-IPH contributed four papers. Besides the aforementioned publishers and Taylor and Francis Group, IOP Publisher, Copernicus Publication, MIP, and the University of Belgrade, all publishers only published one article within UHFM from 2011–2020 (Figure 5).
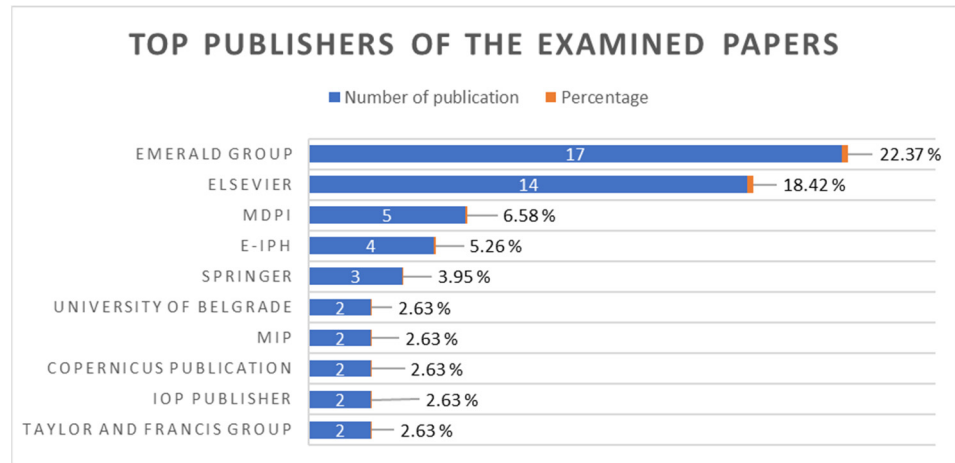

Figure 5. Top publishers of UHFM-related articles.

4.1.4. Subject Areas of Publications

From the examined papers, this study found out that 71.05% of the literatures were from the heritage management or conservation field, while 28.95% of them were FM oriented (Figure 6).
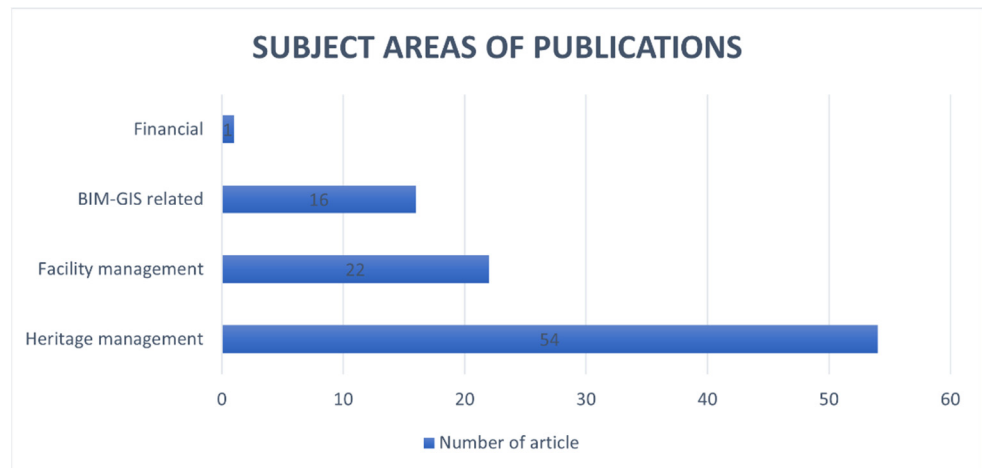
Figure 6. Subject areas of publications.

From the combined field of works of literature, it was discovered that BIM-GIS related topics were discussed the most [33,34,36–39,54–63] and represented 21.05% of the examined papers. Only one article (1.32%) directly addressed a financial issue of urban heritage facility management [64]. The potential of BIM and its wide application possibilities in UHFM were acknowledged broadly due to its capability in providing heritage assets information management, modelling, and real-time assessment regarding components of both heritage management and urban FM within an urban heritage area.

4.2. Overview of the Results

4.2.1. Mapping Resources

The discussion around the first step of the HUL approach, mapping resources, was dominated by the usage of building information modelling (BIM, H-BIM, ACTIVe3D, BIM4FM) as an information management tool within the "civic engagement", "knowledge and planning", and "regulatory systems" [36,37,54,62,63,65]. The usage of BIM technology was not stated by any author regarding the financial aspect of the HUL supporting tools within the mapping resources step, although it is important for efficiency [58] and cost-saving in the long run. As argued by Salaj et al. [66], the discussion around financial instruments showed the potential of expanding the PPP model into PPPP (Table 1). At the same time, another author discussed more on the characteristics that might affect the heritage property price and value [67].

The potential of big data, social media, the Internet of Things (IoT), and artificial intelligence [42,68] in facilitating people to engage in the mapping resources step voluntarily within the UHFM context was also discussed among authors. The effort to integrate the interoperability of BIM and geographic information systems (GIS) could be a breakthrough for urban information modelling (UIM) [37,54,56,62], or even further, urban heritage information modelling (UHIM). Implementation of the 3D modelling through HBIM (historic-BIM) in heritage buildings' interventions made it possible for stakeholders to understand the significance and necessary actions required in the process [36,54,56,63] and made it easier for the facility managers to project and plan ahead for the future maintenance needs [36,63,69,70]. The authorities could create new requirements on permit application of renovating protected buildings by obligating the stakeholder to provide BIM-friendly data of the building to be added to the heritage database as a part of regulatory systems to accelerate the usage of BIMs [54].

Table 1. List of authors discussing the mapping-resources supporting tools of the HUL approach within the urban heritage facility management field.

HUL Critical Steps	HUL Supporting Tools			
	Civic Engagement	Knowledge and Planning	Regulatory Systems	Financial
1. Mapping Resources	Bello, 2019 Ginzarly, 2018 Khoo, 2018 McDonald, 2011 Salaj et al., 2020 Salaj et al., 2020b	Andersen, 2014 Cecchini, 2019 Charlton, 2020 Devetakovic, 2018 García, 2018 Marzouk, 2020 McDonald, 2011 Salaj et al., 2020b Valese, 2020 Veldpaus, 2013	Bello, 2019 Charlton, 2020 Jordan-Palomar, 2018	Salaj et al., 2020b Zin, 2019

The review showed the lack of discussion on natural and cultural mapping and identification. Most authors only addressed the mapping of human resources and the processes involved in FM and conservation. It is understandable because the rigid scoping review process produced a very concentrated topic within the UHFM field.

4.2.2. Reaching Consensus

"Reaching consensus" as the second step of the HUL approach was the least discussed point within the examined papers compared to the other five steps, with the "civic engagement" aspect becoming the most discussed topic within this step. Consensus building was achieved by raising awareness of citizens' disparities. The way neighborhoods acted as a collaborative community could improve livability issues through cooperation amongst themselves and the municipality [66,71] by increasing people's willingness to change their behavior through motivational and socio-psychological theory [20] (Table 2).

Table 2. List of authors discussing the reaching-consensus supporting tools of the HUL approach within the urban heritage facility management field.

HUL Critical Steps	HUL Supporting Tools			
	Civic Engagement	Knowledge and Planning	Regulatory Systems	Financial
2. Reaching Consensus	García, 2018 McDonald, 2011 Salaj et al., 2020 Salaj et al., 2020b Tobi, 2013 Zawawi, 2011	García, 2018 McDonald, 2011 Salaj et al., 2020b	Bello, 2019 Hussain, 2014	Salaj et al., 2020b

Although reaching consensus amongst scholars, experts, and heritage-related practitioners on how heritage should be adequately "consumed" by the people has become an ongoing never-ending process [63], reaching consensus on what to preserve could be achieved through community involvement, citizen engagement, or citizens' participation [65,66]. It was argued that increasing knowledge and education amongst the stakeholders could improve the interest in protecting and preserving important cultural heritage (tangible or intangible) once people were personally related [65,66]. Therefore, technical information about heritage should be interpreted or adapted in layman's terms for the public interest [63]. Extending FM's current knowledge at the strategical, tactical, and operational levels of urban planning, data modeling, multi-criterion, modelling optimization, predictive modelling, demographic method, communication method, and 3D modelling technique might be the answer to "reaching consensus" within "knowledge and planning tools". Meanwhile, developing FM knowledge areas on new business models such as PPPP and financial aspects [66] would act as financial supporting tools for this second step of the HUL approach. Urban FM or social enterprises were introduced to manage the community facilities operations better due to the risk of a "conflict of interest" in implementing outsourcing, privatization, and joint ventures [72].

4.2.3. Assessing the Vulnerabilities

Considering the HUL approach recommended by UNESCO, the "assessing vulnerabilities" step aimed to deal with global warming, climate change, and other environmental issues. Therefore, vulnerabilities assessment and adaptation to climate change to develop local strategies (i.e., local regulations and laws) are urgently needed [73,74] (Table 3). It is also considered essential to monitor the impact of urban development and various change factors in cultural heritage settings [11]. However, the discussion amongst authors in the examined paper show that assessment on the heritage management policy [75], the presence (and the absence) of self-organization of neighborhood residents [20], and the possibilities of using BIM to create a virtual digital environment of the construction project [76] are also critical.

Some authors addressed the necessity to assess the urban heritage assets' architectural aesthetic, artistic aspects, social, economic, and historical aspects [11,77–81]. Firzan [78], Ho [76], Umar [82], and Samodra [83] highlighted the significance of utility and maintenance assessment in improving people's health and well-being. Citizen satisfaction would also improve the participation of local communities [84], therefore, also needs to be assessed.

The municipality and heritage authority must monitor the evaluation of conformity with current technical requirements as well as preserving its cultural history by adhering to heritage conservation codes [78,81,85,86]. However, the authority should be aware of the audit-style evaluation method that results in "creative compliance", which undermines initial goals and leads to dysfunctional behavior [73].

Table 3. List of authors discussing the assessing-vulnerabilities supporting tools of the HUL approach within the urban heritage facility management field.

HUL Critical Steps	HUL Supporting Tools			
	Civic Engagement	Knowledge and Planning	Regulatory Systems	Financial
3. Assessing Vulnerabilities	Bello, 2019 Firzan, 2017 Ho, 2018 Khoo, 2018 Salaj et al., 2020b	Attia, 2020 Boyle, 2018 Dastgerdi, 2019 Dyson, 2016 Firzan, 2017 Hanafi, 2018 Ho, 2018 Huids, 2013 Hussein, 2014 Kristl, 2019 Medici, 2020 Mignard, 2014 Nielsen, 2016 Roders, 2013 Sadeghi, 2018 Samodra, 2019 Torre, 2020 Veldpaus, 2013	Bello, 2019 Boyle, 2018 Dastgerdi, 2019 Firzan, 2017 Ho, 2018 Khoo, 2019 Sanjbod, 2016 Umar, 2018 Veldpaus, 2014	Stendebakken, 2015

This scoping review indicated that the financial aspect of UHFM as the third critical step of the HUL approach is not being extensively addressed as a vulnerability. Assessing the cost analysis of the alternatives available in historic building conservation projects [86] is the only financial aspect in "assessing vulnerabilities" step. However, Dastgerdi [87] also argued that budget availability would directly affect priorities.

4.2.4. Integrating Values and Vulnerabilities

UHFM creates a strong, mutually supportive, and non-exploitative community by improving human performance, public participation, health, and well-being [27,88], coping with the demand of the citizen who wishes to live close to the city center (but with a community atmosphere) [15] and allowing local communities the chance to participate in the co-design process [66] (Table 4).

Incorporating value and vulnerability (in terms of HUL's knowledge and planning tools) emphasized the BIM's ability to enhance proficiency in instances where various designs are implemented, making advanced maintenance tasks possible by delivering simulation, computation, and analysis to support planning [39,89]. Integration of BIM and diagnosis-aided HBIMM with artificial intelligence for automation might be the instrument to assess the computation, structural vulnerabilities, and surveying unsatisfactory condition grades within the platform of BIM acting as a decision-making support system [34]. On an urban scale, 3D city models could be considered a conservation strategy by expanding BIM into city information modelling (CIM) [60].

Discussion on the regulatory systems indicated that the law and regulation improvement are needed to enable heritage management to have a legal basis and enhanced the promotion and awareness of heritage protection, thus improving urban sustainability accordingly to the three basic pillars of society, environment, and economy [88,90]. In order to achieve a sustainable UHFM, it is argued that improvement of the heritage laws that enabled restorations' financing, supporting private investors, and creating a diverse, vital and innovative economy should be integrated comprehensively [27,88,91]. Integrating economic, educational, health, and cultural activities could potentially be a catalyst for the development of the community, not only to attract tourists [92,93].

Table 4. List of authors discussing the integrating values and vulnerabilities supporting tools of the HUL approach within the urban heritage facility management field.

HUL Critical Steps	HUL Supporting Tools			
	Civic Engagement	Knowledge and Planning	Regulatory Systems	Financial
4. Integrating Values and Vulnerabilities	Hu, 2016 Kristl, 2019 Lindkvist, 2019 Nijkamp, 2020 Salaj et al., 2020b Shehata, 2015 Talamo, 2019	Almeida, 2016 Andersen, 2014 Atta, 2020 Aziz, 2016 Bruno, 2017 Colucci, 2020 Dong, 2011 Gao, 2019 Hu, 2016 Kristl, 2019 Lindkvist, 2019 Maltese, 2016 Marzouk, 2020 Mignard, 2014 Moioli, 2018 Nijkamp, 2020 Talamo, 2019 Terryn, 2012 Torre, 2020 Vukmirovic, 2020	Dong, 2011 Kristl, 2019 Torre, 2020	Kristl, 2019 Nijkamp, 2020 Torre, 2020

4.2.5. Prioritizing Action

The main goal of urban heritage conservation is to preserve the authenticity, unique characteristics, and cultural identity of the urban heritage area [32,94] in order to improve the dwellers' well-being, reinforce neighborhood, enhance physical and social public wellness, increase citizen participation, and create more equitable and satisfying places by sustainably transforming the physical environment [27,92,95], for example, the creation (or re-creation) of urban (heritage) attractive public space by redesigning and programming existing active public plaza [27,92]. One thing to be considered, heritage assets should be protected through the application of preventive maintenance and monitoring rather than executing significant repairs, restoration, or reconstruction to preserve better the authenticity of the assets [96].

The sustainability could be achieved by enhancing the promotion and place branding to increase heritage tourism [97] and increase local commercial activities, property, and land value of nearby buildings by improving environmental services, employment opportunities, and revenue from tourism due to the prospective new use of the protected assets [32,98]. At the same time, emphasizing ethical land use patterns reduces extreme economic disparities [92]. The effectively converted building would be able to produce enough revenue to fund its future self-sufficiency. The practical and intangible advantages of adaptive reuse projects far surpassed the entire cost, including maintenance costs [32] (Table 5).

The three-dimensional modelling of cities from the integration of BIM and GIS provided an efficient way to share information and knowledge about architectural heritage for professional users, stakeholders, and experts engaged in the policy-making process and the management of the territory [58]. The BIM-enabled approach supported access control management by intuitively creating physical access control policies, conveniently managing physical access control systems, and effectively auditing physical access control logs [39]. Historic BIM (HBIM) implementation might enhance conservation practices, improve data maintenance and friendly 3D interface, and enable hazard recognition and risk assessment [33,56,91]. It led to efficient authority's service delivery by widening its coverage and improving the quality using the latest technology [84]. Embracing modern information technology's appropriate application in (urban) FM promoted efficient and

successful historic building maintenance and day-to-day operations through the use of information technology [42].

Table 5. List of authors discussing the prioritizing actions supporting tools of the HUL approach within the urban heritage facility management field.

HUL Critical Steps	HUL Supporting Tools			
	Civic Engagement	Knowledge and Planning	Regulatory Systems	Financial
5. Prioritizing Actions	Bello, 2019 Hu, 2016 Li, 2019	Aigwi, 2020 Bello, 2019 Biagini, 2016 Colucci, 2020 Sodangi, 2013 Gao, 2019 Hassan, 2015 Hu, 2016 Li, 2019 Mignard, 2014 Nijkamp, 2020 Rosa, 2020 Saccucci, 2018 Torre, 2020 Vukmirovic, 2020	Aigwi, 2020 Andersen, 2014 Gao, 2019 Hu, 2016 Khoo, 2019 Nijkamp, 2020 Torre, 2020	Aigwi, 2020 Hu, 2016 Valese, 2020

4.2.6. Establishing Framework and Partnership

Urban FM established an interactive, effective, collaborative governance that enabled co-creation, co-finance, and co-ownership within urban public spaces to increase people's trust, attachment, commitment, inclusion, and integration. Therefore, it enhanced massive public participation in the urban heritage conservation process through urban collaborative decisions using evaluation-based techniques [32,66,76] by putting persons and organizations at the center of urban planning and revitalization through a variety of creative techniques, optimizing social and natural capital, and creating more fair and enjoyable places through community facilities [72,95].

Urban FM can be implemented to provide an integrated array of services supporting the operation, fruition, and valorization of urban goods by optimizing BIMs and enhancing information management for urban FM as a critical enabler for a more sustainable built environment [57,59]. In the service of cultural heritage protection, social media gave new information on regular contacts with the historic urban landscape and heritage locations. On the other hand, assets management provided a holistic way to combine data from many approaches to support particular applications and assist decision-making [99] (Table 6).

Table 6. List of authors discussing the establishing framework and partnership supporting tools of the HUL approach within the urban heritage facility management field.

HUL Critical Steps	HUL Supporting Tools			
	Civic Engagement	Knowledge and Planning	Regulatory Systems	Financial
6. Establishing Framework and Partnership	Aigwi, 2020 Hasbollah, 2015 Ho, 2018 Li, 2019 Salaj et al., 2020 Salaj et al., 2020b Tobi, 2013 Vukmirovic, 2020	Almeida, 2016 Colucci, 2020 Gao, 2019 García, 2018 Ginzarly, 2018 Hasbollah, 2015 Langston, 2013 Li, 2019 Sadeghi, 2018 Vukmirovic, 2020	Aigwi, 2020 Colucci, 2020 Khoo, 2018 Li, 2019 Moretti, 2018 Shehata, 2015 Veldpaus, 2013	Afiqah, 2018 Ho, 2018 Hu, 2016 Li, 2019 Salaj et al., 2020

The government's stimulus creation through planning laws would encourage adaptive reuse initiatives [32]. Revitalizing historic buildings through a partnership scheme adopting the PPP and PPPP model would create a local economic generator in urban heritage districts [66,76,92]. It is suggested to include a partnership of stakeholders using an adaptive reuse strategy for urban regeneration in the urban planning policy [32,93]. Using adaptive reuse potential (ARP) modeling, the government would be able to establish the most efficient approach to carry out adaptive reuse interventions on heritage buildings, maximizing financial returns and enhancing productivity while decreasing environmental impact [42,100].

4.2.7. Overall Outlook

To summarize the overall result, a summary table was being developed to give a wider perspective on this study. Findings from the previous subsections were simplified into list of key points for each HUL step (Table 7). The total number of studies from every tool and step were added to give a side-to-side notion of this scoping review. It was evident that the "reaching consensus" and "mapping resources" steps were not as intensively studied as the other four critical steps of the HUL approach. The potential application of BIMs in the urban heritage facility management context is often discussed in every critical step of HUL, along with adaptive reuse, PPP/PPPP, and citizen awareness and participation.

Table 7. Overall representation showing cross-cutting themes and concepts between urban FM and the HUL approach within the examined papers of scoping review, key points, and the number of studies on each HUL step.

HUL Critical Steps	HUL Supporting Tools				Σ	Key Points
	CE	KP	RS	F		
1. Mapping resources	6	10	2	2	20	Mapping resources using BIM/H-BIM, Mapping the existing PPP/PPPP, Mapping the heritage property price and value.
2. Reaching consensus	6	3	2	1	12	Citizen awareness, Consensus building, Collaborative community, Citizen engagement/participation, Education/developing knowledge, Interpretation of technical information.
3. Assessing vulnerabilities	5	18	9	1	33	Coping with climate change, Monitoring the impact of urban development, Utility and maintenance assessment, Citizen satisfaction assessment, Urban heritage policy assessment, Digital assessment using BIMs.
4. Integrating values & vulnerabilities	7	20	3	3	33	Improving human resources, Improving public participation, Improving health and well-being, BIM and AI to enhance efficiency, Heritage law and regulation improvement.
5. Prioritizing actions	3	15	7	3	28	Maintaining the authenticity, Preserving cultural identity, Efficient service delivery from the authorities, Enhance physical and social well-being, Preventive maintenance, Adaptive reuse, Enabled BIM integration approach, Increasing citizen participation.
6. Establishing framework & partnership	8	10	7	5	30	Collaborative governance, Urban collaborative decisions, Digital information optimation, Adaptive reuse approach, PPP/PPPP schemes.

CE: Civic engagement tools; KP: Knowledge and planning tools; RS: Regulatory system; F: Financial tools.

5. Discussion

In order to have a deeper understanding of the UHFM, the research questions were required to be answered. The first research question was how urban heritage conservation is related to urban FM throughout the examined papers. This scoping review indicated that the urban heritage conservation field is closely related to urban FM. Urban heritage conservation and urban FM are required to conduct similar technical tasks such as urban infrastructures, facilities, and scheduled maintenance. The latest landscape-based approach in managing the historical area, the HUL approach, recommended by UNESCO in 2011, also gave special attention to the people as an essential component, comparable with FM and urban FM, which are people-oriented disciplines. Implementation of FM in urban heritage areas was considered unique in a manner that it is supposed to be conducted accordingly to the international, national, and regional heritage codes and laws. With the exception of urban FM implementation in non-heritage regions, which focuses on improving people's well-being, efficiency, and effectiveness, the UHFM is obligated to make every effort to preserve the district's authenticity and historical significance, regardless of cost. The key was finding the balance between efficiency, people's well-being, and preserving authenticity.

To address the second research question on what are the dimensions of UHFM in the body of literature, this scoping review structured the discussion by clustering the critical points from the combined field works of literature according to six critical steps and the HUL approach's supporting tools. The overview of all dimensions showed that the frequency of authors or articles on each critical step directly indicated the intensity of discussion within examined papers. Around 71% of the articles in the literature addressed the UHFM dimensions from the heritage management point of view, while the rest were from the FM perspective. However, BIM's dimension was being discussed repeatedly from both fields, indicating that a mutual entanglement could be addressed from the technological aspect of managing the heritage district.

The second step, "reaching consensus", using participatory planning and stakeholder consultation, became the step that was least discussed compared to the other five critical steps. This lack of debate was surprising. From phase-zero of the preliminary review, many case study publications considered the "reaching consensus" step as one of the most crucial parts of a landscape-based approach in the urban heritage context. On the contrary, the "civic engagement" tool was the second-largest aspect discussed within the examined papers, thus consistent with phase-zero. On the second critical step of HUL, the "reaching consensus" step, the "civic engagement" aspect was the most extensive topic being discoursed (Table 2). It even exceeded the number of authors discussing "knowledge and planning" tools, which consistently dominated the discussion in the other five critical steps.

The last research question on how the HUL supporting tools (related to urban FM) were placed within the critical steps of the HUL approach was responded to by creating a cross-sectional matrix between the six critical steps and the supporting tools of the HUL approach. From the scoping review, it was seen that all four supporting tools support each critical step, but not each of them was equally balanced. The "mapping resources step" as the first step was mainly supported by all three supporting tools but was lacking in the "financial tool" discussions, with only two authors discussing it. This step was also lacking discussion regarding the natural and cultural mapping process. The second step, "reaching consensus", indicated that citizen participation was a crucial aspect. To enhance civic engagement, technical information concerning urban heritage management should be tailored for the non-expert stakeholder interest. Within the third step, "assessing vulnerabilities", the intended purpose was to deal with socio-economic pressure, global warming, climate change, and environmental issues. However, the supporting tools discussed among authors tended to give more attention to the assessment of the compliance with current technical standards while at the same time maintaining its cultural heritage by following the heritage building codes needed. The "civic engagement" tools in the

fourth step, "integrating values and vulnerabilities", mainly discussed the role of UHFM in creating a resilient community.

In contrast, the "knowledge and planning" tool discussed the potential of expanding BIMs into CIMs. Adjustments to heritage legislation that allow for restoration funding, private investor support, and the creation of a diversified, dynamic, and creative economy should be incorporated fully through regulatory systems and financial tools. The fifth step, "prioritizing actions", was primarily supported by all four tools to fulfill the fundamental purpose of urban heritage conservation: to preserve the authenticity and historical value of the urban heritage area. The last critical step, "establishing partnerships and local management frameworks", focused on creating collaborative and interactive governance to improve citizens' sense of engagement. The government's stimulus creation through planning regulations would support adaptive reuse projects as the best sustainable method to maintaining historic places. Historic building revitalization through a partnership scheme based on the PPP and PPPP models would establish a local economic generator in urban heritage areas.

Due to the limitation of this scoping review, it is interesting to see the results of similar research, which include grey literature within the study such as reports from the caretaker of historical districts and world heritage sites, standards from the professional associations, and thesis or dissertation works within the combined field of heritage management and urban FM within the examined papers. The language limitation has also limited the publication search, excluding the works of literature in heritage management and FM from other leading countries such as Japan, China, and other European non-English speaking countries. The potential of having a more comprehensive understanding could be achieved by addressing this research from another perspective limited in this study. The financial aspect that was the least discussed topic in this study would probably be addressed more intensively in some of the grey literature excluded from this scoping review.

6. Conclusions

The purpose of this paper was to achieve a comprehensive understanding of operable criteria within the cross-section discipline (urban heritage management and urban FM) with the aim to provide key elements of UHFM. The study indicated a close relation between urban FM and the urban conservation field, as both required similar technical tasks to be conducted such as urban infrastructures, facilities, and scheduled maintenance. However, UHFM emphasized more on maintaining the authenticity of the protected heritage area than cost-benefit outcomes. Since urban FM was in its establishment process as the expansion of FM, and the HUL approach were understudied components of the conservation field, this study that linked the urban scale heritage conservation and facility management was urgently needed to achieve a comprehensive understanding.

This scoping review introduced UHFM, which could potentially enrich the fields of urban FM and urban heritage management. This study is—filling the gaps—in understanding both fields with the way the UHFM was being shaped to some extent in complying with higher-level heritage codes and regulations. It also made it easier to identify the supporting factors in achieving the main goals of urban heritage conservation, which are maintaining the authenticity and preserving the historical values of the heritage assets. Looking from the perspective of urban FM, it could be found from this scoping literature review that not all the four supporting tools were equally balanced. Although lacking in financial discussions, by providing cross-sectional key elements such as adaptive reuse, PPPP, the potential of BIM, and collaborative government and community within concise steps and tools, UHFM could promote a more operable value-based approach that made it possible for the local heritage authorities to better implement UNESCO's recommendation on the historic urban landscape approach.

The urban FM field as an expansion of FM in an urban scale could also benefit from this UHFM study since many existing regulations concerning historic buildings, and urban heritage areas were established earlier and acknowledged internationally, nationally, and

locally. From that perspective, this study could help in defining heritage attributes and values, which the urban FM could support. By addressing each critical step deeper and through the supporting tools of the HUL approach, further research is necessary to be conducted in understanding how FM could be better integrated into the urban heritage management field. Moreover, additional operable tools to address the technical scope of UHFM still need to be explored. Study cases within the standardized urban heritage area, such as world heritage sites, are essential to formulate and validate within the UHFM framework due to their strong bonds with the international heritage conservation criteria. This study also made it possible for further research on the topic of resiliency or disaster recovery within the urban heritage area from the FM and urban FM point of view.

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References

1. Ginzarly, M.; Houbart, C.; Teller, J. The historic urban landscape approach to urban management: A systematic review. *Int. J. Herit. Stud.* **2019**, *25*, 999–1019. [CrossRef]
2. Taylor, T.; Landorf, C. Subject-object perceptions of heritage: A framework for the study of contrasting railway heritage regeneration strategies. *Int. J. Herit. Stud.* **2015**, *21*, 1050–1067. [CrossRef]
3. Bandarin, F.; van Oers, R. *The Historic Urban Landscape: Managing Heritage in an Urban Century*; Wiley: Hoboken, NJ, USA, 2012; ISBN 9780470655740.
4. Roders, A.P.; Bandarin, F. *Reshaping Urban Conservation: The Historic Urban Landscape Approach in Action*; Springer: Berlin/Heidelberg, Germany, 2019; Volume 2, ISBN 981108887X.
5. Stephenson, J. The cultural values model: An integrated approach to values in landscapes. *Landsc. Urban Plan.* **2008**, *84*, 127–139. [CrossRef]
6. Thompson, C.W. Landscape perception and environmental psychology. In *The Routledge Companion to Landscape Studies*; Routledge: Milton Park, UK, 2018; pp. 19–38, ISBN 1315195062.
7. Gobster, P.H.; Nassauer, J.I.; Daniel, T.C.; Fry, G. The shared landscape: What does aesthetics have to do with ecology? *Landsc. Ecol.* **2007**, *22*, 959–972. [CrossRef]
8. Tress, B.; Tress, G. Capitalising on multiplicity: A transdisciplinary systems approach to landscape research. *Landsc. Urban Plan.* **2001**, *57*, 143–157. [CrossRef]
9. Hou, H.; Wu, H. A case study of facilities management for heritage building revitalisation. *Facilities* **2020**, *38*, 201–217. [CrossRef]
10. Roders, A.P.; Van Oers, R. World Heritage cities management. *Facilities* **2011**, *29*, 276–285. [CrossRef]
11. Veldpaus, L.; Roders, A.P. Historic urban landscapes: An assessment framework part II. In Proceedings of the 29th Conference of Sustainable Architecture for a Renewable Future (PLEA 2013), Munich, Germany, 10–12 September 2013; pp. 1–5.
12. Veldpaus, L. *Historic Urban Landscapes: Framing the Integration of Urban and Heritage Planning in Multilevel Governance*; Technische Universiteit Eindhoven: Eindhoven, The Netherlands, 2015.
13. Salaj, A.T.; Bjørberg, S.; Støre-Valen, M.; Lindkvist, C. Urban facility management role. In Proceedings of the 5th International Academic Conference Places and Technologies, Belgrade, Serbia, 26–27 April 2018; pp. 24–27.
14. Salaj, A.T.; Lindkvist, C.M. Urban facility management. *Facilities* **2020**, *39*, 525–537. [CrossRef]
15. Lindkvist, C.; Temeljotov-Salaj, A.; Collins, D.; Bjorberg, S. Defining a niche for facilities management in smart cities. In Proceedings of the 1st Nordic Conference on Zero Emission and Plus Energy Buildings, Trondheim, Norway, 6–7 November 2019; Volume 352.
16. Nielsen, S.B.; Sarasoja, A.L.; Galamba, K.R. Sustainability in facilities management: An overview of current research. *Facilities* **2016**, *34*, 535–563. [CrossRef]
17. Aceves-Avila, C.D.; Berger-García, M.A. Sustainable facilities management in higher education institutions. *Encycl. Sustain. High. Educ.* **2019**, 1802–1809.

18.   UNESCO. *Recommendation on the Historic Urban Landscape*; UNESCO: Paris, France, 2011.

19.   Kuijlenburg, R. Teaching urban facility management, global citizenship and livability. *Facilities* **2020**, *38*, 849–857. [CrossRef]

20.   Salaj, A.T.; Lindkvist, C.; Jowkar, M. Social needs for sustainable refurbishment in Trondheim. In Proceedings of the 19th EuroFM Research Symposium (EFMIC 2020), Online Conference, 3–4 June 2020; pp. 51–61.

21.   Salaj, A.T.; Bjoerberg, S.; Boge, K.; Larssen, A.K. Increasing attractiveness by LCC facility management orientation. *IFAC-PapersOnLine* **2015**, *48*, 149–154.

22.   Xue, Y.; Temeljotov-Salaj, A.; Engebø, A.; Lohne, J. Multi-sector partnerships in the urban development context: A scoping review. *J. Clean. Prod.* **2020**, *268*, 122291. [CrossRef]

23.   Depietri, Y.; McPhearson, T. Integrating the grey, green, and blue in cities: Nature-based solutions for climate change adaptation and risk reduction. In *Nature-Based Solutions to Climate Change Adaptation in Urban Areas*; Springer: Cham, Switzerland, 2017; pp. 91–109.

24.   Haase, D.; Kabisch, S.; Haase, A.; Andersson, E.; Banzhaf, E.; Baró, F.; Brenck, M.; Fischer, L.K.; Frantzeskaki, N.; Kabisch, N. Greening cities—To be socially inclusive? About the alleged paradox of society and ecology in cities. *Habitat Int.* **2017**, *64*, 41–48. [CrossRef]

25.   Kardan, O.; Gozdyra, P.; Misic, B.; Moola, F.; Palmer, L.J.; Paus, T.; Berman, M.G. Neighborhood greenspace and health in a large urban center. *Sci. Rep.* **2015**, *5*, 1–14. [CrossRef] [PubMed]

26.   Jennings, V.; Gaither, C.J. Approaching environmental health disparities and green spaces: An ecosystem services perspective. *Int. J. Environ. Res. Public Health* **2015**, *12*, 1952. [CrossRef]

27.   Nijkamp, J.E.; Mobach, M.P. Developing healthy cities with urban facility management. *Facilities* **2020**, *38*, 819–833. [CrossRef]

28.   Avčin, B.A.; Šarotar, B.N.; Salaj, A.T. More proactive facility management role for resilience at the workplace. In Proceedings of the Joint CIB W099 and TG59 International Safety, Health, and People in Construction Conference, Salvador, Brazil, 1–3 August 2018; p. 130.

29.   UNESCO. *Operational Guidelines for the Implementation of the World Heritage Convention*; UNESCO: Paris, France, 2019; pp. 1–177.

30.   Prabowo, B.N.; Pramesti, P.U.; Ramandhika, M.; Sukawi, S. Historic urban landscape (HUL) approach in Kota Lama Semarang: Mapping the layer of physical development through the chronological history. In Proceedings of the 3rd International Conference on Sustainability in Architectural Design and Urbanism, Surakarta, Indonesia, 29–30 August 2019; Volume 402, p. 12020.

31.   Rey-Pérez, J.; Roders, A.P. Historic urban landscape: A systematic review, eight years after the adoption of the HUL approach. *J. Cult. Herit. Manag. Sustain. Dev.* **2020**, *10*, 233–258. [CrossRef]

32.   Aigwi, I.E.; Ingham, J.; Phipps, R.; Filippova, O. Identifying parameters for a performance-based framework: Towards prioritising underutilised historical buildings for adaptive reuse in New Zealand. *Cities* **2020**, *102*, 102756. [CrossRef]

33.   Biagini, C.; Capone, P.; Donato, V.; Facchini, N. Towards the BIM implementation for historical building restoration sites. *Autom. Constr.* **2016**, *71*, 74–86. [CrossRef]

34.   Bruno, S.; De Fino, M.; Fatiguso, F. Historic building information modelling: Performance assessment for diagnosis-aided information modelling and management. *Autom. Constr.* **2018**, *86*, 256–276. [CrossRef]

35.   Ciocia, C.; Napolitano, T.; Viola, S. Diagnostic monitoring for historic urban landscape case study: Building in Via Caracciolo Napoli. *Eur. Sci. J.* **2013**, *9*, 1857–7881.

36.   Charlton, J.; Kelly, K.; Greenwood, D. The complexities of managing historic buildings with BIM. *Eng. Constr. Archit. Manag.* **2020**, *28*, 570–583. [CrossRef]

37.   Devetaković, M.; Radojević, M. Application of BIM technology in the processes of documenting heritage buildings. In Proceedings of the 5th international Academic Conference on Places and Technologies, Belgrade, Serbia, 26–27 April 2018.

38.   Ewart, I.J.; Zuecco, V. Heritage building information modelling (HBIM): A review of published case studies. In Proceedings of the 35th CIB W78 2018 International Conference: IT in Design, Construction, and Management, Chicago, IL, USA, 1–3 October 2018; Springer International Publishing: New York, NY, USA, 2019; pp. 35–41.

39.   Gao, X.; Pishdad-Bozorgi, P. BIM-enabled facilities operation and maintenance: A review. *Adv. Eng. Inform.* **2019**, *39*, 227–247. [CrossRef]

40.   Alexander, K. Facilities management: A strategic framework. *Facil. Manag. Theory Pract.* **2013**, 1–13. [CrossRef]

41.   Atkin, B.; Brooks, A. *Total Facility Management*; John Wiley & Sons: Hoboken, NJ, USA, 2021; ISBN 1118655389.

42.   Li, Y.; Zhang, Y.; Wei, J.; Han, Y. Status quo and future directions of facility management: A bibliometric-qualitative analysis. *Int. J. Strateg. Prop. Manag.* **2019**, *23*, 354–365. [CrossRef]

43.   Senior, C.; Jowkar, M.; Temeljotov-Salaj, A.; Johansen, A. Empowering citizens in a smart city project one step at a time: A Norwegian case study. In Proceedings of the 2021 IEEE European Technology and Engineering Management Summit (E-TEMS), Dortmund, Germany, 18–20 March 2021; IEEE: Manhattan, NY, USA, 2021; pp. 10–15.

44.   Grum, D.K. Interactions between human behaviour and the built environment in terms of facility management. *Facilities* **2018**, *36*, 2–12. [CrossRef]

45.   Hauge, Å.L.; Hanssen, G.S.; Flyen, C. Multilevel networks for climate change adaptation–what works? *Int. J. Clim. Chang. Strateg. Manag.* **2019**, *11*, 215–234. [CrossRef]

46.   Gohari, S.; Larssæther, S. Sustainable energy planning as a co-creative governance challenge. Lessons from the Zero Village Bergen. *Int. J. Sustain. Energy Plan. Manag.* **2019**, *24*, 147–154. [CrossRef]

47. Michell, K. FM as a social enterprise. In *Managing Organizational Ecologies*; Routledge: Milton Park, UK, 2013; pp. 167–177. [CrossRef]

48. Bröchner, J.; Haugen, T.; Lindkvist, C. Shaping tomorrow's facilities management. *Facilities* **2019**, *37*, 366–380. [CrossRef]

49. Levac, D.; Colquhoun, H.; O'Brien, K.K. Scoping studies: Advancing the methodology. *Implement. Sci.* **2010**, *5*, 69. [CrossRef]

50. Colquhoun, H.L.; Levac, D.; O'Brien, K.K.; Straus, S.; Tricco, A.C.; Perrier, L.; Kastner, M.; Moher, D. Scoping reviews: Time for clarity in definition, methods, and reporting. *J. Clin. Epidemiol.* **2014**, *67*, 1291–1294. [CrossRef]

51. Tricco, A.C.; Lillie, E.; Zarin, W.; O'Brien, K.; Colquhoun, H.; Kastner, M.; Levac, D.; Ng, C.; Sharpe, J.P.; Wilson, K. A scoping review on the conduct and reporting of scoping reviews. *BMC Med. Res. Methodol.* **2016**, *16*, 1–10. [CrossRef] [PubMed]

52. Arksey, H.; O'Malley, L. Scoping studies: Towards a methodological framework. *Int. J. Soc. Res. Methodol.* **2005**, *8*, 19–32. [CrossRef]

53. Grant, M.J.; Booth, A. A typology of reviews: An analysis of 14 review types and associated methodologies. *Health Inf. Libr. J.* **2009**, *26*, 91–108. [CrossRef] [PubMed]

54. Almeida, A.; Gonçalves, L.; Falcao, A.; Ildefonso, S. 3D-GIS Heritage city model: Case study of the historical city of Leiria. In Proceedings of the 19th AGILE International Conference on Geographic Information Science, Helsinki, Finland, 14–17 June 2016.

55. Aziz, N.D.; Nawawi, A.H.; Ariff, N.R.M. ICT evolution in facilities management (FM): Building information modelling (BIM) as the latest technology. *Procedia-Soc. Behav. Sci.* **2016**, *234*, 363–371. [CrossRef]

56. Cecchini, C. From data to 3D digital archive: A GIS-BIM spatial database for the historical centre of Pavia (Italy). *J. Inf. Technol. Constr.* **2019**, *24*, 459–471. [CrossRef]

57. García, E.S.; García-Valldecabres, J.; Blasco, M.J.V. The use of HBIM models as a tool for dissemination and public use management of historical architecture: A review. *Int. J. Sustain. Dev. Plan.* **2018**, *13*, 96–107. [CrossRef]

58. Jordan-Palomar, I.; Tzortzopoulos, P.; García-Valldecabres, J.; Pellicer, E. Protocol to manage heritage-building interventions using heritage building information modelling (HBIM). *Sustainability* **2018**, *10*, 908. [CrossRef]

59. Maltese, S.; Fradegrada, G.; Moretti, N.; Dejaco, M.C.; Re Cecconi, F. GIS application in urban district maintenance. In Proceedings of the 41st IAHS World Congress on Housing, Sustainability and Innovation for the Future, Albufeira, Portugal, 13–16 September 2016.

60. Mignard, C.; Nicolle, C. Merging BIM and GIS using ontologies application to urban facility management in ACTIVe3D. *Comput. Ind.* **2014**, *65*, 1276–1290. [CrossRef]

61. Moretti, N.; Dejaco, M.C.; Maltese, S.; Cecconi, F.R. An information management framework for optimised urban facility management. In Proceedings of the 35th International Symposium on Automation and Robotics in Construction (ISARC 2018), Berlin, Germany, 20–25 July 2018.

62. Saccucci, M.; Pelliccio, A. Integrated BIM-GIS system for the enhancement of urban heritage. In Proceedings of the Metrology for Archaeology and Cultural Heritage (MetroArchaeo), Cassino, Italy, 22–24 October 2018; IEEE: Manhattan, NY, USA, 2018; pp. 222–226.

63. Sadeghi, M.; Hashem, M.S.; Mehany, M.; Strong, K.; Mehany, M. Integrating building information models and building operation information exchange systems in a decision support framework for facilities management. In Proceedings of the Construction Research Congress, New Orleans, LA, USA, 2–4 April 2018.

64. Zin, N.M.; Ismail, S.; Azmi, F.A. Ascertaining the Economic Sustainability of Heritage Property Market based on Sales Transaction Analysis. *Environ. Behav. Proc. J.* **2018**, *3*, 247–254.

65. Mcdonald, H. Understanding the antecedents to public interest and engagement with heritage. *Eur. J. Mark.* **2011**, *45*, 780–804. [CrossRef]

66. Salaj, A.; Gohari, S.; Senior, C.; Xue, Y.; Lindkvist, C. An interactive tool for citizens' involvement in the sustainable regeneration. *Facilities* **2020**, *38*, 859–870. [CrossRef]

67. Zin, N.M.; Ismail, S.; Mohamad, J.; Hana, N.; Maimun, A.; Afiqah, F.; Azmi, M. Critical determinants of heritage property value: A conceptual framework. *J. Malays. Inst. Plan.* **2019**, *17*, 219–231.

68. Ginzarly, M.; Roders, A.P.; Teller, J. Mapping historic urban landscape values through social media. *J. Cult. Herit.* **2019**, *36*, 1–11. [CrossRef]

69. Andersen, P.D.; Andersen, A.D.; Jensen, P.A.; Rasmussen, B. Sectoral innovation system foresight in practice: Nordic facilities management foresight. *Futures* **2014**, *61*, 33–44. [CrossRef]

70. Marzouk, M.; El Sharkawy, M.; Elsayed, P.; Eissa, A. Resolving deterioration of heritage building elements using an expert system. *Int. J. Build. Pathol. Adapt.* **2020**, *38*, 721–735. [CrossRef]

71. Wan Abdullah Zawawi, N.A.; Abdullah, A. Evaluating stakeholders' preferences: Reconciling heritage and sustainability in Kuala Lumpur traditional areas. *J. Malays. Inst. Plan.* **2011**, *IX*, 37–50. [CrossRef]

72. Tobi, S.U.M.; Amaratunga, D.; Noor, N.M. Social enterprise applications in an urban facilities management setting. *Facilities* **2013**, *31*, 238–254. [CrossRef]

73. Boyle, L.; Michell, K.; Viruly, F. A critique of the application of neighborhood sustainability assessment tools in urban regeneration. *Sustainability* **2018**, *10*, 1005. [CrossRef]

74. Dastgerdi, A.S.; Sargolini, M.; Pierantoni, I. Climate change challenges to existing cultural heritage policy. *Sustainability* **2019**, *11*, 5227. [CrossRef]

75. Veldpaus, L.; Roders, A.P. Learning from a legacy: Venice to Valletta. *Chang. Over Time* **2014**, *4*, 244–263. [CrossRef]

76. Ho, D.; Hou, H. Enabling sustainable built heritage revitalisation from a social and technical perspective: A case study. *Facilities* **2019**, *37*, 704–722. [CrossRef]

77. Attia, D.; Maarouf, I.; Taha, D.; Nassar, D. Detecting failures in conservation practice in relation to cultural significance: The case of heritage buildings in Khartoum. *Build. Res. Inf.* **2020**, *48*, 124–139. [CrossRef]

78. Firzan, M.; Keumala, N.; Zawawi, R. Gaps pertaining evaluation on built heritage conservation with special annotation on the Malaysian context. *Pertanika J. Soc. Sci. Humanit.* **2017**, *25*, 21–38.

79. Hanafi, M.H.; Umar, M.U.; Razak, A.A.; Rashid, Z.Z.A. Essential entities towards developing an adaptive reuse model for organization management in conservation of heritage buildings in Malaysia. *Environ. Behav. Proc. J.* **2018**, *3*, 265–276. [CrossRef]

80. Sanjbod, H.S.; Hermans, L.; Reijnders, D.; Veldpaus, L. Captain, where can we find the attributes? *Hist. Environ. Policy Pract.* **2016**, *7*, 177–188. [CrossRef]

81. Umar, S.B.; Said, I. A review on decision-making models and tools in developed countries towards enhancing sustainable built heritage assets in developing countries. *Environ. Behav. Proc. J.* **2018**, *3*, 237–246. [CrossRef]

82. Umar, S.B.; Said, I. Conservation challenges of heritage building reuse in Nigeria: A review of decision-making models. *Asian J. Environ. Stud.* **2018**, *4*, 16–36. [CrossRef]

83. Samodra, F.T.B.; Sudarma, E. Review on environmental and building services performance of urban heritage hospital. In *MATEC Web Conferences*; EDP Sciences: Ulis, France, 2019; Volume 280, p. 04005. [CrossRef]

84. Bello, M.U.; Martin, D.; Kasim, R. The position of facility management services on customer loyalty on malaysian municipal council service delivery. *Spec. J. Urban Plan. Dev.* **2019**, *4*, 17–27.

85. Dyson, K.; Matthews, J.; Love, P. Critical success factors of adapting heritage buildings: An exploratory study. *Built Environ. Proj. Asset Manag.* **2016**, *6*, 44–57. [CrossRef]

86. Stendebakken, M.O.G.; Grytli, E.R.; Olsson, N.O.E. Proposed aspects for evaluation of the value of spaces in historic buildings. *Procedia Econ. Financ.* **2015**, *21*, 23–31. [CrossRef]

87. Dastgerdi, A.S.; Sargolini, M. Vulnerability assessment and conservation of heritage sites in a changing climate. *Int. J. Landsc. Archit. Res.* **2019**, *3*, 121–129.

88. Kristl, Ž.; Temeljotov Salaj, A.; Roumboutsos, A. Sustainability and universal design aspects in heritage building refurbishment. *Facilities* **2019**, *38*, 599–623. [CrossRef]

89. Colucci, E.; Kokkla, M.; Mostafavi, M.A.; Noardo, F.; Spano, A. Semantically describing urban historical buildings across different levels of granularity. *Int. Arch. Photogramm. Remote Sens. Spatial Inf. Sci.* **2020**, 33–40. [CrossRef]

90. Dong, H.X. A tentative study on the world heritage tourism management in China. In Proceedings of the 2nd International Conference on Artificial Intelligence, Management Science and Electronic Commerce (AIMSEC), Zhengzhou, China, 8–10 August 2011; pp. 6532–6537.

91. Della Torre, S. Italian perspective on the planned preventive conservation of architectural heritage. *Front. Archit. Res.* **2020**, *10*, 108–116. [CrossRef]

92. Hu, C.; Gong, C. Creating an ecological historic district: Rethinking a Chinese challenge through the case of Oakland District, Pittsburgh. In Proceedings of the International Conference on Sustainable Design, Engineering and Construction 2016 (ICSDEC 2016): Integrating Data Science, Construction and Sustainability, Tempe, AZ, USA, 18–20 May 2016; pp. 1572–1579.

93. Shehata, W.T.A.; Moustafa, Y.; Sherif, L.; Botros, A. Towards the comprehensive and systematic assessment of the adaptive reuse of Islamic architectural heritage in Cairo: A conceptual framework. *J. Cult. Herit. Manag. Sustain. Dev.* **2015**, *5*, 14–29. [CrossRef]

94. Khoo, S.L.; Lim, Y.M. Dissecting George Town's human capital challenges in built heritage: Voices from the stakeholders. *J. Cult. Herit. Manag. Sustain. Dev.* **2019**, *9*, 376–393. [CrossRef]

95. Vukmirovic, M.; Gavrilović, S. Placemaking as an approach of sustainable urban facilities management. *Facilities* **2020**. [CrossRef]

96. Sodangi, M.; Khamdi, M.F.; Idrus, A.; Hammad, D.B.; Ahmedumar, A. Best practice criteria for sustainable maintenance management of heritage buildings in Malaysia. *Procedia Eng.* **2014**, *77*, 11–19. [CrossRef]

97. Hassan, A.; Rahman, M. World Heritage site as a label in branding a place. *J. Cult. Herit. Manag.* **2015**, *5*, 210–223. [CrossRef]

98. Valese, M.; Noardo, F.; Roders, A.P. World Heritage mapping in a standard-based structured Geographical Information System. *Int. Arch. Photogramm. Remote Sens. Spat. Inf. Sci.* **2020**, *43*, 81–89. [CrossRef]

99. Ginzarly, M.; Teller, J. Eliciting cultural heritage values: Landscape preferences vs representative images of the city. *J. Cult. Herit. Manag. Sustain. Dev.* **2018**, *8*, 257–275. [CrossRef]

100. Langston, C.; Yung, E.H.-K.; Chan, E.H.-W. The application of ARP modelling to adaptive reuse projects in Hong Kong. *Habitat Int.* **2013**, *40*, 233–243. [CrossRef]