Connecting the dots

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Altıntaş Kaptan, Meriç; Ünlü, Aslıhan; Pottgiesser, Uta

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A global exploration of local Docomomo inventories

Meriç Altintaş Kaptan, Aslihan Ünlü, Uta Pottgiesser

ABSTRACT: The Modern Movement encompasses a diverse collection of both iconic and ordinary treasures of architecture worldwide, among which some are safeguarded with respect to their values, while others were demolished, have undergone alterations, neglect, or lack of maintenance and preservation over time. Docomomo has been playing a pivotal role in documenting and safeguarding significant architectural works of the 20th century. Its National and Regional Working Parties (WPs), spread across the globe, have diligently compiled archives of photographs, drawings, historical records, and research materials related to Modern Movement architecture, town planning and landscape design. However, the decentralized nature of these archives poses challenges in terms of accessibility, coordination, and attaining a more comprehensive record of the Modern Movement with a global perspective. Therefore, this study undertakes the explorative task of compiling data from these separate online-available archives of the WPs to attain a broader overview of the documented objects of Modern Movement architecture on a global-scale. The collected data is analyzed to identify patterns, trends, and influential architects and to elaborate on the potential factors contributing to the current status. The study involves analysis of the predominant format of building use/function among documented architectural works, examination of the geographical and chronological coverage of available lists, and the distribution of intervention status within the inventory. These aspects provide valuable insights into the functional diversity, geographic spread, and preservation status of architectural works documented in the dispersed archives. This study also facilitates comparative studies between different regions and countries, shedding light on the shared characteristics and unique contributions of the Modern Movement across diverse cultural contexts. The results help identify trends, gaps, and areas of focus for future research and documentation efforts, ensuring the holistic appreciation of architectural works, and contributing to the scholarly understanding and preservation of this modern heritage.

KEYWORDS: built heritage, Docomomo, documentation, modern architecture, systematic review

INTRODUCTION: This paper is a systematic mapping review and exploration of the local archives, documenting the Modern Movement (MoMo), by Docomomo.[1] The study exclusively concentrates on the publicly available online catalogs and records, published by various Docomomo National or Regional Working Parties (WPs). The primary goal is to present and describe the current state of the global-scale online availability of documentation of MoMo architecture, and to provide a comprehensive overview of the reviewed inventories that are dispersed across slightly varied formats. Acknowledging the substantial efforts of Docomomo International, its International Specialist Committee on Registers (ISC/Registers), and WPs, this overview aspires to compile and derive meaningful insights from the information presented online, recognizing the dynamic nature of the inventories within the Docomomo network. Despite the extensive datasets readily accessible in the digital realm and ongoing digitalization efforts, these inventories continually evolve, undergoing regular updates and refinements. Additionally, it is essential to note the presence of numerous Docomomo documentation fiches. Although not yet completely digitally accessible, they form a vital part of the archival material.

The main research objectives are to identify the predominant format of building use and function among documented projects, the geographical and chronological coverage of available register lists, and the distribution of intervention status within the registers' inventory.[2] The

systematic collection and review of buildings, sites, and neighborhoods on Docomomo's records leads to a compilation of a global-scale building inventory, enabling the identification of common and dominant traits of MoMo architecture, based on Docomomo experts' selection.[3] The results primarily serve to designate data availability, distribution, and research needs by particular attributes. This will offer guidance in establishing a documentation and data acquisition framework, to address content gaps in the building inventory and complement incomplete data, emphasizing the geographical locations or chronological periods requiring further investigation, documentation, and support. The findings aim to contribute to the field in identifying MoMo architecture prevalence based on specific function clusters, their geographical and chronological distribution, and where to access them.

DOCOMOMO DOCUMENTATION EFFORTS AND ONLINE INVENTORIES

Docomomo is an international non-profit organization dedicated to advance the documentation, and conservation of buildings, sites, and neighborhoods of the Modern Movement (Henket & de Jonge, 1989). In 2023, operating through 79 National or Regional Working Parties (WPs), Docomomo International has a network of academics and practitioner members across Europe, the Americas, Asia, Oceania, and Africa.[4] Within the confines of preserving the legacy of the Modern Movement, the WPs are accountable for local activities and respective lists. Given its worldwide inclusiveness and diverse network, Docomomo embodies a vast body of knowledge on modern architectural heritage through a variety of cultures and experiences.

One of Docomomo's key activities is contributing to an international register of important Modern Movement buildings to be preserved and/or documented.[5] WPs collaborate to identify significant modern buildings, document their architectural and historical relevance, potential interventions, and develop strategies for their preservation. Although not aiming for full coverage, these documentations provide valuable background information on noteworthy MoMo landmarks in various countries, contributing to a comprehensive record of the Modern Movement's achievements and informed decision-making on preservation and conservation.

Despite notable endeavors in archive and inventory building, such as Architectuul,[6] SCI-Arc Media Archive,[7] and particular online archives dedicated to renowned architects,[8] a comprehensive international inventory or framework for analyzing the recent past remains challenging. Over the past years, each WP has been contributing to an international register, based on the documentation forms called 'fiches', focusing on the modern legacy deemed most significant in terms of functional, technological and/or social innovation (Bronson & Jester, 1997). The fiches catalog notable buildings, structures, and urban areas, providing comprehensive information about their architectural features, historical context, and significance.[9] Two distinct types of fiches are the "Minimum Documentation Fiche" and "Maximum" or "Full Documentation Fiche", both containing similar sections with the latter offering more comprehensive details.[10] In addition to the regularized 'fiches' format, provided for worldwide data collection and publication, WPs are presenting their local selections differently in the digital world, influenced by their specific organizational setups, opportunities, circumstances, and perhaps, the nature and extent of information obtained.[11] Consequently, the Docomomo repository consists of diverse inventories, varying in levels of detail, display, and consistency, spread across individual national archives worldwide. These inventories undergo continuous updates, editing, and improvement, constituting an ever-evolving process. It is crucial to highlight the numerous fiches that have not yet been made available online.

The decentralized nature of the Docomomo archives is grounded in practical and organizational reasons, reflecting the autonomy of WPs, local focus, and contextual differences. This approach allows for nuanced and region-specific documentation of MoMo heritage, while collectively contributing to a comprehensive understanding of the era. The unique "fiches" and other WP archives and inventories have not yet been integrated into a single centralized repository, although the Docomomo Virtual Exhibition (MoMoVe) can be seen as an important step in that direction.[12] Consolidating this valuable knowledge and documentation into a unified archive could enhance data accessibility, ensure consistent documentation, and provide a cohesive presentation. Therefore, this study collects and integrates the dispersed inventories of the WPs to portray the global situation of MoMo heritage. Additionally, it seeks to acknowledge, praise, and further advocate for these commendable efforts.

PURPOSE AND APPROACH

This paper aims to provide a comprehensive global overview of Docomomo's organized efforts in documenting MoMo architecture. The exploration and data compilation relied primarily on the respective expert selection and building inventories curated by Docomomo WPs, which are available online. Employing a systematic mapping review approach, the study examines, delineates, and categorizes available evidence and potential evidence gaps within the inventories accessible on the web. The

research's key output, a global-scale record of individual WP inventories, serves as a foundational resource for identifying common and dominant traits of MoMo architecture, and conducting comparative analyses. In addition to the reviewed inventories, which are presented either in the standardized format of "Documentation Fiche" or other formats of cataloging and recording, visual representations such as photographs and drawings of the pertinent buildings and sites, were also taken into account throughout the review process.

The main stages of the research, targeted to achieve the stated objective, were (i) identifying data sources and data collection; (ii) data preparation and categorical organization; and (iii) data analysis and evaluation, all of which will be described briefly in the following sections.

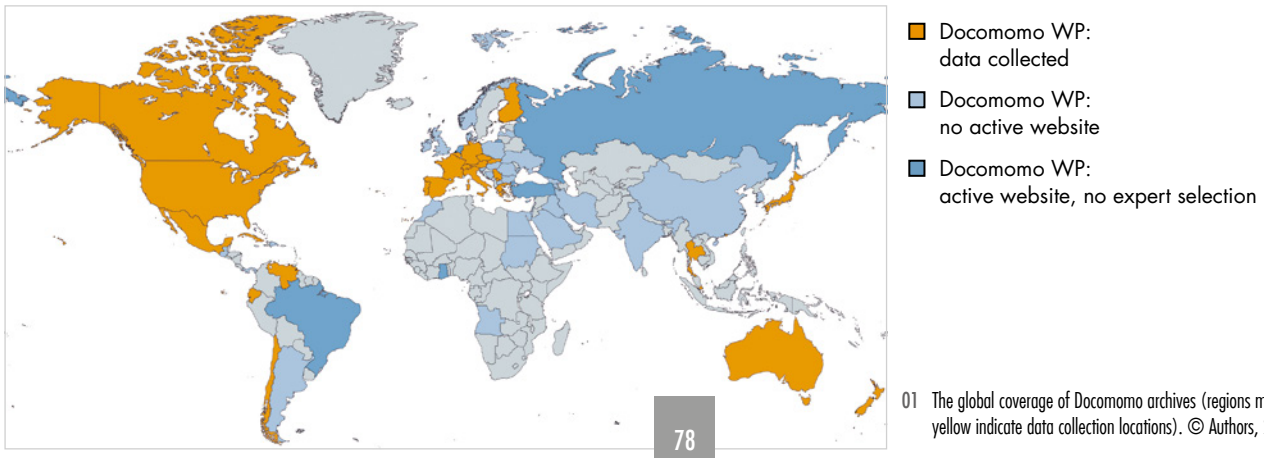
DATA COLLECTION

The data collection process was conducted from June 2021 to September 2022. Thereby any updates after this time frame were not included in this dataset and analysis.[13] Notably, this exclusion indicates that the outstanding and extensive documentation of Docomomo Iberico with 2,442 objects was not included in this inventory. Furthermore, the inventory compiled by Docomomo Turkey, comprising more than 2000 buildings, was omitted from the scope of this study due to its display in poster presentation and summary booklet format on the website. The data collection approach followed was three-fold; firstly, the review and compilation of Docomomo WPs and their digital contact details from the Docomomo International website; secondly, browsing through the WPs' official websites and social media pages to confirm and locate digital data availability; and thirdly, collecting the generic information on buildings and sites (i.e., identification, location, use, status, and further details) using the respective expert selections and building inventories. Throughout the data collection process, no distinction or exclusion was applied between 'minimum' and 'full' documentation fiches; all accessible forms of documentation were incorporated.[14] However, the numerous fiches that have not yet been made accessible online were omitted. Figure 1 visually represents the global coverage of Docomomo by highlighting its members and showcasing the WPs from which the data was collected. Accordingly, all of the 79 WPs' websites were visited and no expert selection was found for 51 of them. Thus far, 2,540 examples were collected from 43 active websites of WPs [FIGURE 01].

DATA ORGANIZATION

Based on the content and quality of data compiled, the dataset was systematically categorized according to four types of attributes identified: Geographical attributes (AG); Chronological attributes (AC); Building use/Function-related attributes (AF); The status of intervention (AI).

- **Geographical attributes (AG):** A region-specific and geography-based approach has been used in the primary organization of data groupings. The regional classification system of United Nations (UN) geoscheme was used, in which countries are divided into five regional categories namely, Africa, Asia, Europe, America (North America & South/Latin America), and Oceania.[15] Turkey is planned to be kept as a separate category among others.[16] Based on the content and attributes of the collected data locations, the geographical attributes were organized into separate input sets of region, country, address, and coordinates.
- **Chronological attributes (AC):** Chronological dating is used for the purpose of obtaining information about the average and age distribution of the registered buildings, and the classification process was carried out with some rounding errors, taking into account the size of the dataset. Ideally, the collected data included information on the year for design commission, construction, and interventions (additions and extensions, if any). However, not all of those dates were available for all buildings. In some cases, a date range was provided for the design and/or construction phases whereas in some cases, only a year was given either for the design or construction of the relevant building. For this reason, all these varying data were collected and saved aside, and a new input set was generated based on them which presented only the initial date relating to each building entry. By this means, every building entry has only one date that could be used over a timeline and other chronological analysis.



01 The global coverage of Docomomo archives (regions marked yellow indicate data collection locations). © Authors, 2023.

- **Building use/Function-related attributes (AF):** One specific focus of this study is to identify the intensity and distribution analysis of the original use of the collected buildings and sites. For this purpose, the WPs own coding was utilized primarily, when collecting data on cases from their website. However, it was observed that there were slight variations in building classification codings among different working groups. In response, supplementary sources such as the ICOMOS 20th Century Thematic Framework (Marsden and Spearritt, 2021), which defines its own categories, were reviewed—but their thematic approach was found unsuitable for this study. Therefore, Docomomo's building classification guide list (2003) was adopted as the foundational reference, and a new two-level classification systematic was devised to ensure consistency and accuracy in the analysis [TABLE 1].[17] The proposed grouping includes nine macro-categories and sixteen sub-categories of building use.
- **The status of intervention (AI):** The information regarding the intervention status of the collected buildings and sites was not readily available in all Docomomo records.[18] Therefore, the status of intervention was designated by the author based on the available information on the condition of the buildings and sites, including any alterations made since the construction (if applicable). In instances where no pertinent information regarding the significant alterations was obtained from the official website or documentation 'fiches', the intervention status of the relevant building was recorded as "n/a (not available)".

DEFINING THE CRITERIA FOR ANALYSIS

The analyses performed in this study aims to identify focus areas across a global-scale building inventory, to understand the characteristics of the available dataset to derive meaningful insights, and to find patterns across qualitative data. As the dataset is determined by textual information, frequency, dispersion and variation of pre-defined attributes were investigated based on data groupings and attribute categorization using contextual keywords.

Based on the embedded information and content availability of the collected data, certain properties and attributes surfaced that characterize the dataset and were

Table 1 Proposed groupings of building use.

CATEGORY	SUB-CATEGORY	BUILDING EXAMPLES
assembly & leisure (ALE)	recreation (REC)	Cinemas, concert halls, museums, art galleries, pavilions, club houses, private halls, clubs, public parks, gardens, sports centers, gymnasia, stadia, sports grounds, movie and opera houses, theaters, drive-in theaters …
institutional (INS)	administration (ADM)	Parliamentary, government, civic and public buildings, professional institutions …
	commercial (COM)	Banks, markets, offices, public houses, restaurants, cafés, retailing, service premises, storage buildings …
	defense (DEF)	Fortifications, military installations …
	education (EDC)	Libraries, archives, record offices, research establishments, schools, universities and colleges …
	health (HLT)	Hospitals, surgeries, nurseries, health centers …
	law (LAW)	Law courts, penal institutions, police buildings …
	religion (REL)	Cathedrals, chapels, churches, mosques, synagogues, temples and other places of worship, church halls, meeting houses, religious centers, seminaries, presbyteries, manses, monasteries, convents, religious houses, shrines, places of pilgrimage …
public services (PBS)	infrastructure (INF)	Cleansing services, district heating, electricity supply, fire, ambulance services, gas supply, hydraulic power supply, sanitary provision, water supply, drainage, sewage disposal
	transport & communications buildings (TRC-b)	TV and radio broadcasting stations, networks, and facilities; telecommunications and postal facilities; stations and terminal facilities, public transport interchanges and urban mass transit stations …
	transport & communications environs (TRC-e)	Roads, freeways, and motorways; paths (including pedestrian, bicycle access); bus and coach services/networks; bridges, canals; civil aviation; railways; shipping and port facilities; broadcasting and telecommunications networks
production (PRO)	farming, fishing (FAF)	Farming, fishing, fish farming, forestry, horticulture …
	industrial (IND)	Building industries, ceramics, chemicals, engineering, extractive industries, food and drink processing, marine construction, metal industries, textiles, wood-working industries …
residential (RES)	Architect-designed houses (RES-a); group of buildings, complex (RES-c); experimental (RES-e); hotels (RES-h); single-family housing (RES-s); apartment block/multi-family housing (RES-m); student accommodation (RES-s)	
urban elements (URE)	funerary (FNR)	Cemeteries, graveyards, crematoria, funerary monuments, mausolea
	landscape (LND)	Agricultural settlement, botanic gardens, arboretums, forestry, land reclamation, national and regional parks
	monument (MON)	Public, commemorative monuments, sculpture (free-standing)
unclassified (UNC)	-	
urbanism (URB)	no sub-categories	New towns and villages, town extensions, urban development, reconstruction
mixed use	administration (ADM) & law (LAW); residential (RES) & commercial (COM); commercial (COM) & education (EDU); residential, event hall, cafe, and discotheque; war memorial and civic hall …	

later used for defining analysis criteria. Among those were primarily the information on building use, location, and year of design/construction. The status of intervention was additionally generated by the authors, as it was considered essential to this research.

This study entails a two-level analysis approach to derive meaningful and to-the-purpose outcomes. The initial stage encompasses a preliminary/exploratory analysis, wherein individual attributes are examined separately. Subsequently, in the second stage, a cross-cluster examination is conducted to analyze all attributes collectively, aiming to identify and comprehend their interrelationships. The analyses were carried out on the categorized data according to (AG), (AC), (AF), and (AI).

RESULTS AND ANALYSIS

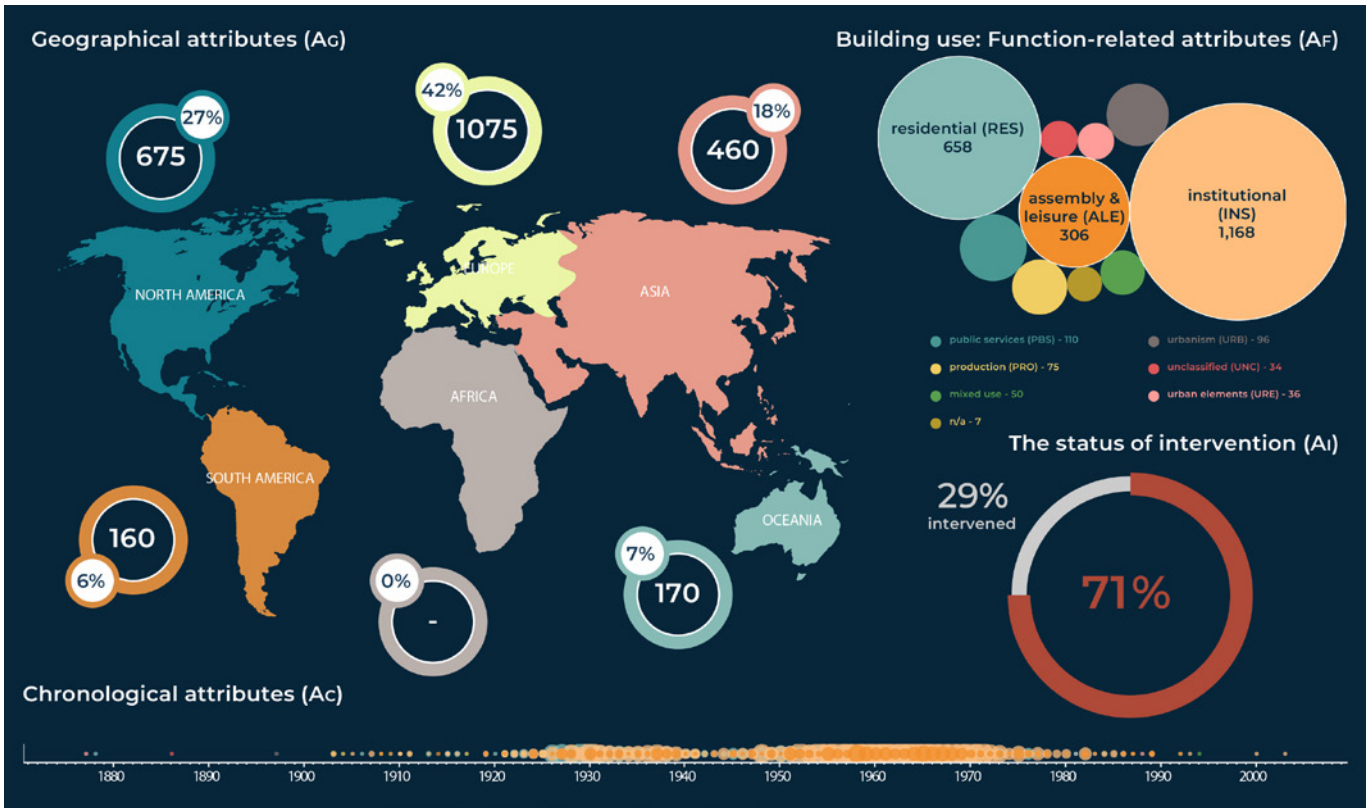
The first stage of analysis, exploratory data analysis, includes the individual examination of attributes, namely (AG), (AC), (AF), and (AI). The exploratory analysis is about performing initial investigations to explore data relationships and discover patterns among the variables that are aforementioned attributes.

The geographical attributes of the dataset indicate that the majority of collected data is from Europe (42%), North America (27%), and Asia (18%) respectively [FIGURE 02]. This information flow is followed by Oceania (7%) and South America (6%). Since there was no online inventory of buildings or data on expert selection available from working groups located in Africa, there are currently no data collected there. The chronological attributes of the dataset suggest that a considerable measure of buildings and sites collected from Docomomo national/regional building inventories were designed and constructed within the period between 1920-1980, with a notable break roughly during 1940-1950. The predominant formats of building use among collected data are observed to be 'institutional (INS)', 'residential (RES)', and 'assembly & leisure (ALE)'. Lastly, only about 29% of the entire dataset had 'intervened' information available, which corresponds to 729 of 2,540 entries.[19]

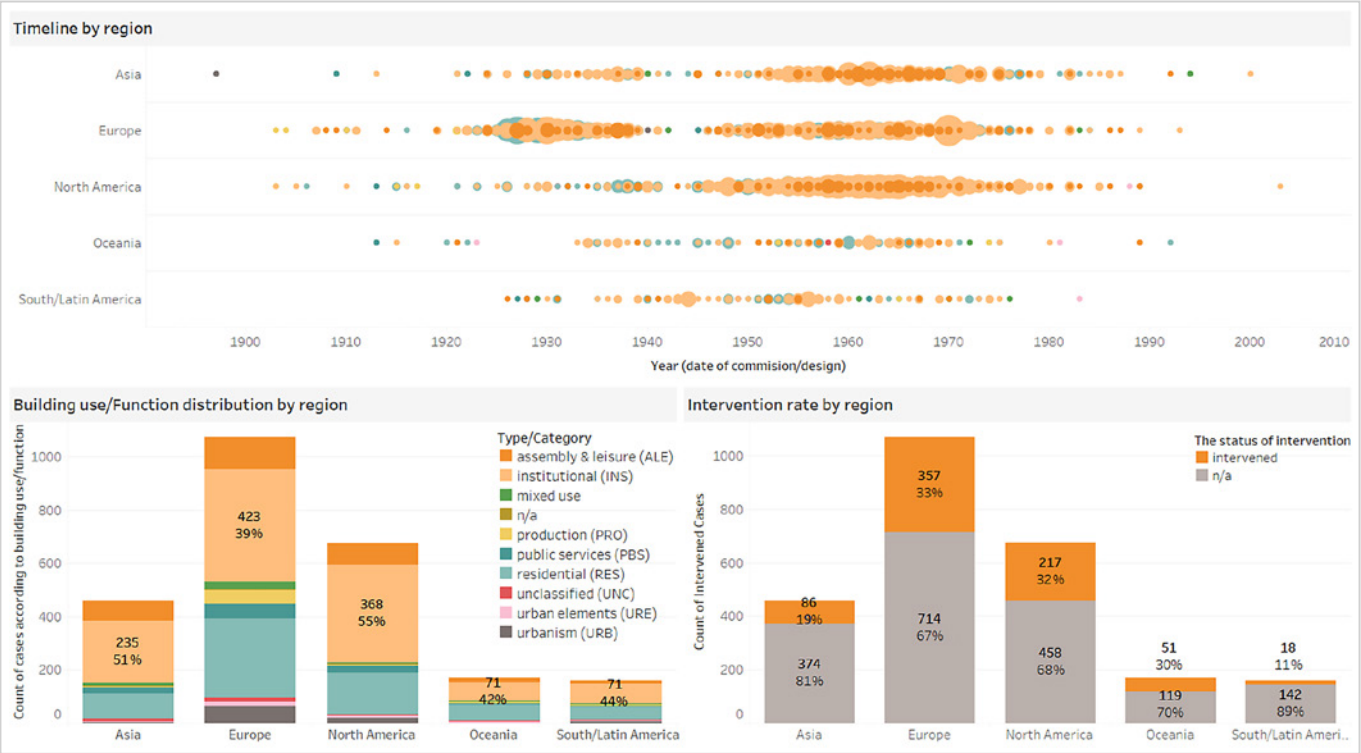
The second stage of analysis includes cross-attribute examinations of each ascribed quality in relation to others. The grounds for comparison include the previously mentioned attributes of the dataset, which are geographical, chronological, function-related and intervention status characteristics.

ANALYSIS BASED ON GEOGRAPHICAL ATTRIBUTES (AG)

The region-/country-wise examination of collected building use intends to clarify the intensity and distribution of modern buildings based on specific function clusters, for certain time periods, and by filtering intervened cases. This analysis also aims to uncover the data availability as well as lack of content (building inventory) where further investigation might be needed in the future to expand the scope and comprehensiveness of the inventories. Accordingly, (AC), (AF), and (AI) were analyzed according to the region, which is one of the (AG) of the dataset [FIGURE 03].



02 Data infographics on 'Geographical attributes (AG)', 'Chronological attributes (AC)', 'Building use: Function-related attributes (AF)', and 'The status of intervention (AI)' of the dataset. © Authors, 2023.



03 Timeline by region, building use/function distribution by region and intervention rate by region. © Authors, 2023.

First of all, the interruption in the timeline during the period of 1940-1950, which undoubtedly demonstrates the effects of World War II, is prevailing in Europe, North America, Asia, and Oceania, but with less to no impact in South/Latin America. When the frequency and distribution of building use/function clusters are analyzed across regions, (INS) buildings and sites come forth as a commonly predominant function cluster in all regions, and is followed by (RES) in all. The status of intervention, on the other hand, remained as a minority in all regions, but the region with the highest rate of intervention is documented to be North America with 32% and 217 cases.

Examining the frequency distribution of the original building use/function clusters from a slightly more detailed geographical perspective, it is determined that (INS) buildings and sites are predominating in almost all Docomomo WP inventories except for Germany, Greece, Iberico (Spain and Portugal), and Belgium where (RES) cases are overriding and for Kosovo, where the functions could not be identified due to the inaccessibility of information in all cases.

ANALYSIS BASED ON CHRONOLOGICAL ATTRIBUTES (AC)

The data on chronological dating of building inventory is used for the examination of information organized on a timeline, in order of occurrence. Thereby, the chronological order and analysis of modern building activities are provided which could be linked to the historical events calendar and used in the determination of obvious gaps in the time diary. In this regard, the timeline for different function clusters can be investigated.

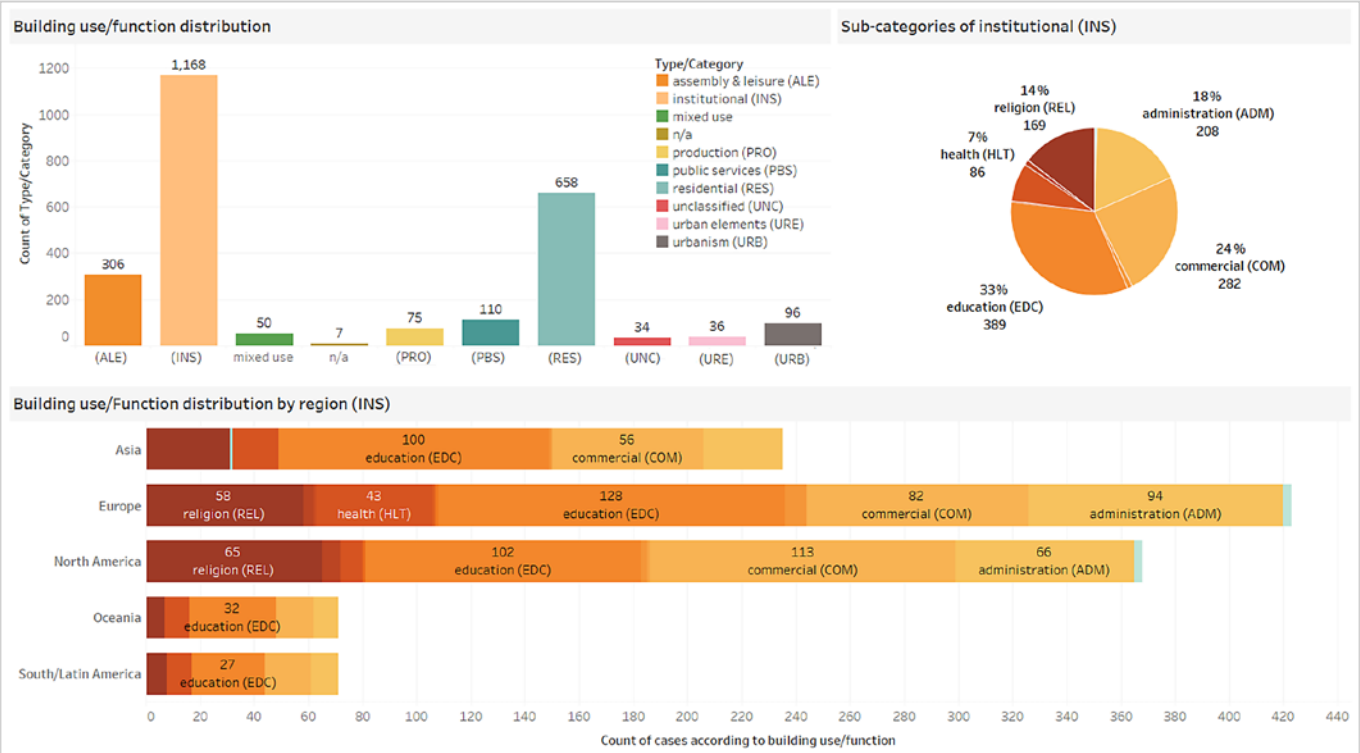
Examining the chronological dating of the data inventory according to the original building use/function clusters on a timeline, it is observed that the design and construction of certain typologies, in particular (INS), (RES), and (ALE), continued escalating in the post-war period, especially between 1950-1980. The remarkable break of the war period is evident for all function clusters however, it is not statistically easy to deduce for categories with fewer cases.

ANALYSIS BASED ON BUILDING USE: FUNCTION-RELATED ATTRIBUTES (AF)

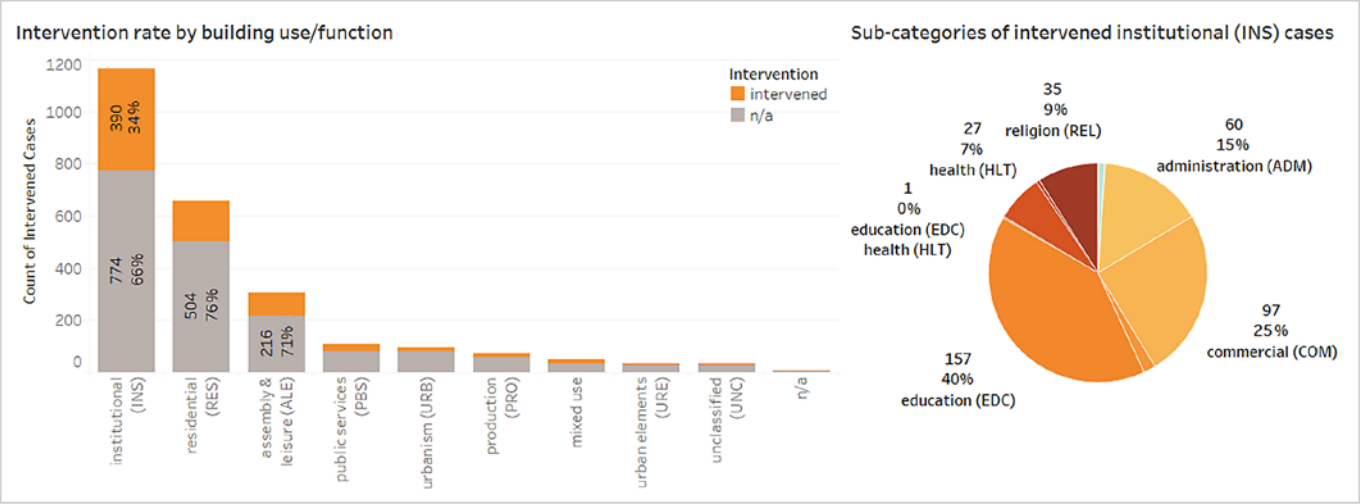
The cross-attribute analysis on selected and prominent function sets is essential to gain a deeper understanding of their breakdown, and indeed, to discover linkages with other attributes among dataset.

Exploring the leading building use/function groups across the dataset, the most data-intensive clusters observed are (INS) and (RES), respectively. The category of (INS) buildings, with 1,168 data entries, is the prevailing cluster which also involves many sub-categories [FIGURE 04]. Among those sub-categories, the functions of (EDC) and (COM) emerge as prevailing original uses by 33% and 24% respectively. (EDC), being the cluster where the most data convene, is the prime in every region except for North America, where (COM) buildings stand out.

The second main building use/function group across the dataset, (RES) is comprised of 654 data entries and involves several sub-categories. Among those, the sub-category (RES-s) is leading by a long way (31%). Examining the regional distribution of sub-categories, an interesting result revealed that in South/Latin America, (RES-h) appears as the prime sub-cluster in which the most data convene.



04 Unravelling the function-related attributes (AF). ©Authors, 2023.



05 Intervention rate. ©Authors, 2023.

THE STATUS OF INTERVENTION (AI)

The status of intervention, which was generated following the data collection process, is used in the extraction and filtering of intervened cases among the dataset. This elimination facilitates selective examination of intervened cases according to other analysis parameters. As presented in [FIGURE 05], the group with the highest percentage of intervention among the building use/function clusters is reasonably (INS), which can be rationalized by its highest data density. The pie-chart shows the breakdown of sub-categories belonging to institutional buildings that have undergone intervention, and the ranking of sub-categories remains unchanged compared to previous analysis. Based on the data-density hierarchy of sub-categories, the functions (EDC) and (COM) emerge as prevailing original uses that have undergone an intervention by 40% and 25% respectively.

Examining interventions according to (AG), and (AF) provides information about the building use/function cluster with the highest number of altered buildings and their geographical distribution.

RESULTS AND DISCUSSION

Understanding the functional diversity of MoMo heritage, the geographic representation of registered structures, and the level of interventions or alterations they have undergone contributes to a comparative view of the architectural documentation. By compiling data from the decentralized and publicly available archives of Docomomo, a broader understanding of the development and impact of MoMo heritage, on a global-scale can be achieved. Analyzing the collected data provides valuable insights into the chronological evolution, influence, and distribution of modern architectural works, contributing to the scholarly

understanding and preservation strategies of this heritage. Through the results presented in this study, patterns, trends, and influential architects can be identified, and more elaborations on the potential contributing factors to the current status (of the documented buildings) can be made.[20]

KEY FINDINGS

A total of 2,540 items from the years 1877 to 2003 were collected and analyzed. The data collection process took place from June 2021 to September 2022. The primary source of information was designated as Docomomo WPs' official websites. Any new WP or website activated or updated after this period is not included in this database and analyses, such as the outstanding and extensive documentation of Docomomo Iberico, comprising 2,442 objects. It is also noteworthy that, to date, no local inventory of MoMo heritage in Africa has been made publicly available by Docomomo WPs.

The findings indicate a comprehensive geographical coverage of data, with the exception of the African continent. The historic time period covered in register inventories spans from 1877 to 2003, with a notable break roughly during 1940s and 1950s. The prevailing building use/function identified within the collected data is observed to be (INS), accounting for 46% of the records. In regards to the entire dataset, information pertaining to 'intervened' entries is available for approximately 29%.

The WP that demonstrated the greatest influence in terms of national/regional inventories was the United States with 475 cases. Beyond that, the notable working group in Europe was Docomomo Germany with 196 cases; in Asia, Docomomo Japan with 264 cases; in Oceania, Docomomo Australia with 154 cases; and in South America, Docomomo Venezuela with 111 cases. The chronological distribution of the entire dataset revealed concentrations primarily between 1925-1940 and 1950-1980 in Europe. In North America and Asia, while the intensity before the 1950s was not as pronounced in Europe, similar patterns were observed. Finally, examining the intervention rates by building use/function, the (INS) buildings, which are the most common building use cluster, were the cases that received the most intervention here as well.

Inevitably, the study is confronted with certain challenges and limitations due to the inherent individuality and localized nature of distinct Docomomo archives, and problems associated with online data collection.

LIMITATIONS OF THE STUDY

The Docomomo archives provide valuable information and documentation on MoMo heritage; however, deriving definitive conclusions from these living archives presents a challenge. The dynamic nature of the inventories, including ongoing updates and refinements in data, organization, and structure of the inventories within the Docomomo network and WPs, adds complexity to this study. Notably, the presence of numerous fiches, yet unavailable online, further highlights the depth of the archival material. Additionally, the distinct characteristics and attributes of individual inventories also affect the results; the fact that each WP operates autonomously, resulting in variations in the data provided online, level of information detail, and overall organization of catalogues, documents, and records. The main challenges faced during the data collection process and potential limitations posed by the nature of national/regional inventories database that might have impacted or influenced the interpretation of the findings are briefly discussed under six categories as follows:

- **Regional focus:** The Docomomo archives primarily emphasize specific regions and countries where Docomomo WPs are active. However, the active WPs alone may not capture the entirety of the global Modern Movement. The absence of certain regions or buildings in the archives does not imply their lack of significance nor value.
- **Presence in the digital world:** The availability of active websites, online catalogs and records of various Docomomo WPs impacts the data collection process. Challenges arise when WPs' websites are inactive, under maintenance, or non-existent, preventing access to their inventories and records. Additionally, some records may not be fully digitized (e.g. due to copyright issues and capacity limitations) or may have errors during the digital transfer of data.
- **Diversity in coverage and selection:** The documentation efforts of Docomomo WPs are influenced by various factors, including available resources, local trends, priorities, tendencies or needs, and individual expertise. Consequently, variations in the representation and coverage within the archives may occur. The selection of buildings and sites for documentation can be subjective, potentially leading to unintentional oversights or underrepresentations, especially when prioritizing heritage in imminent danger. These selections are occasionally guided by certain 'themes' identified in the plan of action and documentation priorities (referred to as 'homework') outlined by Docomomo International.
- **Data consistency and detail:** Online catalogs, documents, and records in individual Docomomo WP archives may lack a cohesive and standardized online data structure. The level of information detail varies among WPs, posing challenges when trying to access and compare information across different Docomomo archives.
- **Evolving knowledge and research perspectives:** The information and interpretations within the Docomomo archives represent the knowledge available at the time of their compilation. Over time, new research

and insights may emerge, potentially reshaping our understanding of modern heritage. This challenge extends to variations in the recency of relevant websites and building data among WPs; leading to differences in regular record updates and website maintenance practices. Such variability may complicate the process of accessing accurate and up-to-date information from the individual Docomomo archives.

The Docomomo archives are a valuable starting point for ongoing investigation and exploration. Eventually, further work is advisable to supplement the information with additional research from other sources, including academic publications, local archives, and other preservation organizations. Embracing multiple perspectives and diverse sources of information is key to attaining a more comprehensive understanding of modern heritage.

CONCLUSIONS

This study and its process have demonstrated and substantiated the dynamic nature inherent in these online inventories. It is widely acknowledged that a substantial portion of the inventory collected and documented over the years still awaits digitization, owing to a variety of reasons. During the course of data collection, and in the subsequent phases of statistical analysis and manuscript preparation, ongoing efforts among various WPs deserve specific acknowledgement. Docomomo Austria, Docomomo Belgium, Docomomo Iberico, Docomomo US, and several others, have been consistently expanding, restructuring, and digitizing their register lists, or transferring their previously documented records, which may have existed in hardcopy formats, into the digital realm. Furthermore, this transformative shift toward digitization has been accompanied by significant updates to their respective websites. These updates encompass a range of substantial modifications, including individual building-specific enhancements, expansions or reorganization of register lists, and adjustments to the overall website layout. Most WPs are actively exploring various innovative presentation methods designed to capture readers' attention and enhance information accessibility. These multifaceted efforts collectively signify a dynamic evolution in the digital representation of architectural heritage resources.

In the realm of Docomomo online architectural inventories, various formats coexist, but the cornerstone of comprehensive conservation lies in detailed documentation fiches. Unlike other formats, these structured documents serve as repositories of expert knowledge and provide standardized, in-depth information encompassing architectural intricacies, historical contexts, and conservation methods, offering insights beyond visual representation. Beyond the extensive documentation efforts conducted over the years, the present state necessitates a systematic compilation, analysis, and collaborative presentation of these accumulated archives. This 'meta-documentation' study, characterized by its comprehensive nature and the potential for regional and national categorization, holds the potential to significantly augment Docomomo's future documentation initiatives and strategic research initiatives.

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ENDNOTES

1 See https://docomomo.com/

2 The research objectives of this paper are primarily driven by an ongoing doctoral study conducted by the corresponding author.

3 The term 'Modern Movement (MoMo)' as used by Docomomo refers to modern architecture characterized by functional, technological and/or social innovations aimed at addressing and adapting to contemporary conditions and challenges.

4 See https://docomomo.com/organization/

5 See Docomomo Constitution. https://docomomo.com/wp-content/uploads/2022/09/Revision-2022-DOCOMOMO-Constitution.pdf

6 See https://architectuul.com/

7 SCI-Arc Media Archive serves as an online showcase of videos featuring prominent architects, designers, and theorists — including 11 Pritzker Prize winners—from 1972 to the present. https://www.youtube.com/sciarcmediaarchive

8 Here is a compilation of freely accessible online archives of renowned architects, often hosted by universities or foundations, encompassing a rich collection of photos, drawings, sketches, and writings. However, these archives focus on specific architectural figures and may not provide a comprehensive outlook. https://exhibits.stanford.edu/bucky; https://breuer.syr.edu/; http://www.fondationlecorbusier.fr/; https://open-archive.bauhaus.de/eMP/eMuseumPlus; https://www.fondazionerenzopiano.org/en/project/?mode=box

9 Systematic 'fiches', some of which have been featured in the Docomomo Journal, biennial international conference proceedings, and various book publications, serve as a structured documentation method. Noteworthy examples were compiled by Dennis Sharp and Catherine Cooke in 2000 in the book *The Modern Movement in Architecture: Selections from the Docomomo Registers*, which includes around 800 entries sourced from the fiches within the Docomomo International Register. While Sharpe and Cooke edited the book, the material was written and provided by each of the represented WPs based on 'fiches'. This significant effort in documentation and compilation, exemplifies the comprehensive approach taken to understanding the broader architectural landscape.

10 Contrasting the two, the 'Full Documentation Fiche' offers a more comprehensive level of detail. It encompasses additional sections, such as those exploring the historical context, evaluation criteria, and extensive documentation of the building or site. Consequently, the 'Full Documentation Fiche' serves as a more exhaustive and in-depth tool for recording information related to Modern Movement buildings and sites.

11 Across several WPs, including Austria, Belgium, Czech Republic, Finland, France, Greece, Iberico, Switzerland, and numerous others not explicitly mentioned here, variations in the presentation and arrangement of selections and archives were observed.

12 See https://exhibition.docomomo.com/

13 It is imperative to underscore that individual WPs possess yet unshared resources. The substantial number of fiches or documentations derived from it, that remain unpublished online, may notably be constrained not only by copyright issues but also by capacity limitations. Ultimately, this network thrives on the dedication and efforts of volunteering experts in the field, each contributing years of invaluable experience and commitment. For instance, the inventories of Docomomo Iberico, as presented in this study, differ from their current status. The authors recognize the outstanding and extensive inventory of this WP, which has been expanding its online presence, and updating its website recently. However, since the data collection was completed prior to these updates and with the purpose of maintaining consistency with all other WPs, the study refrained from incorporating updated data.

14 MoMove was excluded from consideration in this paper due to its specific purpose on consolidating the dispersed archives of WPs. Notably, MoMove has not received regular updates since 2015. In contrast, the local archives, as a general practice, undergo more frequent updates and revisions by their respective WPs, and therefore served as the primary source for this study.

15 See https://unstats.un.org/unsd/methodology/m49/

16 For clarity, it is important to note that Docomomo Turkey maintains an active website with over 2000 cases of Modern Movement architecture. However, these cases are recorded in the form of poster presentations, compiled in annual summary booklets, rather than in the regularized format of 'documentation fiche' or as part of experts' selection. Given the substantial number of these cases, which is nearly equal to the world-wide collection, Turkish cases were not included in this dataset to maintain consistency with all other WPs. Nevertheless, this extensive documentation effort deserves recognition and acknowledgement.

17 See http://www.docomomo.ec/Portals/0/Old/Building-classification.pdf. The categories of 'type/category' and 'sub-category' were reproduced and reformatted by the authors.

18 It is noteworthy that Docomomo commenced its collection of 'Good Conservation and Restoration Practice' fiches only in 2010. These fiches provide more comprehensive information on interventions as compared to the previous documentation fiches.

19 Identifying altered examples was an important aspect of this study. However, the intervention status was not readily available for every case collected. In some instances, case descriptions from the respective WP records were used to extract this information; otherwise, it was marked as 'not available.' Consequently, the number of altered examples is significantly low, potentially not reflecting the actual situation.

20 The global-scale overview and findings outlined in this study shall serve as a foundation for future research within the doctoral studies aiming to explore potential connections between the documented works and urbanization, urban/rural population growth, cultural and socioeconomic factors, and macroclimatic conditions. While this study does not definitively establish these relationships, it hypotheses for further investigation.

Meriç Altıntaş Kaptan *is a PhD candidate at Istanbul Technical University (ITU), Construction Sciences Program. She received her B.Sc. in Architecture (2015) and M.Sc. in Environmental Control and Building Technologies (2018) from ITU. Between 2018-2019, she has participated as a researcher in an Erasmus+ partnership project entitled "Re-use of Modernist Buildings (RMB)". In 2021, she joined COST Action-MCMH EU as a WG3 member and she was recently involved in the FOMA Forgotten Masterpieces project. Meriç serves as a research assistant in ITU Architecture Department since 2018 and is a Docomomo-TR Technology Committee member. Currently, she is pursuing her studies at TU Delft as a guest PhD researcher.*

Aslıhan Ünlü *graduated from Istanbul Technical University (ITU) with a Bachelor's degree in Architecture. She received her MSc and PhD degrees from ITU. In 2003-2004, she served as a visiting researcher at Lawrence Berkeley National Laboratory. In 2012-2013 being a Fulbright Fellow, she worked as a visiting professor at Roger Williams University. She received her "Full Professorship" in 2014. Prof. Ünlü has been the Dean of the Faculty of Architecture and Design at Ozyegin University (OzU) since 2020. She has conducted research studies on sustainable building technologies, façade systems and performance evaluation. She is a member of Association of Architecture Education, European Façade Network and editorial board member of JFDE.*

Uta Pottgiesser *is Professor for Heritage & Technology at TU Delft (NL) and Professor of Building Construction and Materials at TH OWL (GER). 2017-19 she was Professor of Interior Architecture at the University of Antwerp (BE). In theory and practice, she is concerned with the protection and conservation, reuse and rehabilitation of the built heritage. Chair of Docomomo International with 79 national working parties and editor-in-chief of the Docomomo Journal since 2022. Licensed architect and board member of Docomomo Germany, and from 2016-21 chair of the Docomomo International Specialist Committee of Technology (ISC/T). She graduated in Architecture from TU Berlin and holds a PhD from TU Dresden.*