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# HERMES - Material cultural heritage satellite account – methodological framework

Final Report // February 2025

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# Abbreviations

| | |
|---|---|
| ACE | Architects Council of Europe |
| CCS | Cultural and creative sector |
| CFNA | Central Framework of the National Accounts |
| CHARTER | European Cultural Heritage Skills Alliance project |
| CISA | Creative industries' satellite account |
| CPA | Classification of products by activity |
| CSA | Culture satellite account |
| EC CCS | Mapping the Creative Value Chains – A study on the economy of culture in the digital age |
| EFTA | European Free Trade Association |
| ESA | European system of accounts |
| ESPON HERITAGE | Material Cultural Heritage as a Strategic Territorial Development Resource: Mapping Impacts Through a Set of Common European Socio-economic Indicators project |
| ESSnet-Culture | European Statistical System Network on Culture |
| EUIPO | European Union Intellectual Property Office |
| FLANDERS SA | Conceptual Framework for Flanders Immovable Heritage Satellite Account |
| FIEC | European Construction Industry Federation |
| GDP | Gross domestic product |
| GIAHS | Globally Important Agricultural Heritage Systems |
| GVA | Gross value added |
| IC | Intermediate consumption |
| ICT | Information and communication technology |
| IFLA | International Federation of Library Associations and Institutions |
| INE | Instituto Nacional de estadística |
| IO | Input-Output |
| IOF | Input-Output Framework |
| ISCED | International Standard Classification of Education |
| KAU | Kind-of-activity unit |
| KI | Key Industry |
| LEG | European Leadership Group in Culture Statistics |
| MCH | Material Cultural Heritage |
| NGO | Non-governmental organisation |
| OSM | Open Street Map |
| OUV | Outstanding universal value |
| PDO | Protected Designations of Origin |
| SA | Satellite account |
| SBS | Structural business statistics |
| SHA | System of Health Accounts |
| SIC | Standard Industrial Classification |
| SOC | Standard Occupational Classification |
| TSA | Tourism satellite account |
| UNESCO FCS | UNESCO Framework for Cultural Statistics |
| WDPA | World Database on Protected Areas |
| WHS | World Heritage Sites |

# Foreword by Alessandra Gandini

We are happy to present this final report of the HERMES project – "Material cultural heritage satellite account – methodological framework". This publication represents an important step forward in addressing the growing recognition of cultural heritage as a component of Europe's economic landscape.

To capture its economic contribution, HERMES introduces a methodology tailored to the characteristics of the sector. By adapting the concept of the value chain and embracing an integrated, non-hierarchical model, it highlights the essential activities of identifying, preserving, transmitting, and making cultural heritage accessible.

The HERMES Satellite Account aims to establish a methodology to quantify the economic activities in a series of "key industries" identified by their relationship with the presence of material cultural heritage in an economy. It provides estimates of sectoral aggregates that describe the size and internal composition of the sector, including output and Gross Value Added. It also includes information about employment and non-monetary data on the stock of certain elements that constitute part of the cultural heritage.

We extend our sincere gratitude to the stakeholders who contributed with their time and expertise through consultation events and documents' reviews. Their valuable input, constructive feedback, and thoughtful debates have been instrumental in shaping this work.

Looking ahead, we are eager about the practical application of this methodology. We believe HERMES will not only facilitate the development of material cultural heritage satellite accounts but also inspire further research and foster broader diffusion of its insights.

Alessandra Gandini,
Senior Researcher, TECNALIA

# 1 Introduction

The cultural heritage sector is increasingly recognized as a vital component of Europe's economic landscape and policy frameworks, significantly contributing to social and economic development. The discourse surrounding cultural heritage has evolved from a conservation-focused approach to one that emphasizes sustainability and inclusivity, as highlighted by key initiatives such as the Faro Convention and the European Year of Cultural Heritage (Council of Europe, 2005; EUROPEAN COMMISSION, 2018). Recent EU policies underscore the multidimensional value of cultural heritage, linking it to economic growth, social cohesion, and environmental sustainability. Furthermore, initiatives like Horizon 2020 and the Creative Europe Programme[1] aim to enhance cooperation among stakeholders and promote sustainable practices, ensuring that cultural heritage is passed on to future generations.

Recent EU initiatives have consolidated a value-led discourse around cultural heritage, reflecting its evolving role in society. The 7th Framework Programme and the Joint Programming Initiative on Cultural Heritage and Global Change have provided funding and coordination for projects focused on the protection and enhancement of cultural heritage. The European Year of Cultural Heritage (2018) emphasized its importance for economic growth, social inclusion, and sustainability, while Horizon 2020 initiatives, like the New European Bauhaus, connect cultural heritage to sustainable living and climate action. Overall, these efforts highlight the multifaceted contributions of cultural heritage to social, economic, and environmental goals, supported by various frameworks from organizations like UNESCO, EUROSTAT, EUIPO and OECD.

The cultural heritage sector plays a crucial role in economic development by creating jobs and attracting investments that maintain the viability of heritage sites while preserving their historical and cultural significance. However, accurately valuing its economic contribution remains challenging. Historically, cultural activities were often viewed as purely aesthetic, leading to less attention in economic analysis. International efforts to develop statistics and methodologies for measuring cultural contributions have been led by organizations like UNESCO and UNCTAD. Within Europe, the European Commission has been instrumental in advancing cultural statistics to better quantify the sector's contribution. The 2018 European Year of Cultural Heritage marked a pivotal moment, leading to projects and initiatives focused on understanding the societal impact of cultural heritage. The European Statistical System (ESS) network laid the groundwork for a framework for cultural statistics, which has been adopted and expanded by Eurostat's working group on culture statistics. This includes comprehensive data now available from Eurostat. Additional initiatives, such as the UNESCO Thematic Indicators for Culture in the 2030 Agenda[2] and the Cultural and Creative Cities Monitor[3] illustrate the complexity of cultural and creative sectors and their contribution to economic growth in Europe.

This study emphasizes the intrinsic value of material cultural heritage, which significantly contributes to local and national economies. Material cultural heritage is closely tied to the knowledge and skills of intangible cultural heritage, such as traditional craftsmanship. While the focus of this project is on material heritage, the interdependence with intangible heritage underscores the need for a holistic approach to cultural heritage preservation. The project defines **material cultural heritage** using UNESCO's categories of tangible cultural heritage, focusing on physical objects, structures, and sites of cultural significance, with "material" emphasizing the physical composition and existence of heritage (i.e. embracing cultural heritage sites and assets, cultural landscapes as well as artifacts and objects (movable cultural heritage)).

Quantifying the benefits of material cultural heritage can enable more effective and targeted public investments and stimulate private-sector involvement and contribution willingness, reducing dependence on public funding. Although categorizing material cultural heritage as an economic sector may be debated, the European Commission's Blueprint for sectoral cooperation on skills[4] endorses it as a distinct sector. This recognition not only highlights the EU's interest in the heritage domain but also allows it to be acknowledged as an economic sector,

[1] Creative Europe - Culture and Creativity

[2] https://whc.unesco.org/en/culture2030indicators/

[3] Cultural and Creative Cities Monitor

[4] https://ec.europa.eu/social/main.jsp?catId=1415&langId=en

facilitating the measurement of economic activities and flows. Acknowledging its economic importance aids in effective management and preservation while maintaining its intrinsic value. Despite ongoing efforts to enhance cultural heritage statistics, as highlighted by the ESPON HERITAGE[5] and ESPON HERIWELL[6] projects, fully capturing its economic and societal impact remains difficult, with standardized data often offering a limited view. A significant challenge is the lack of standardized industrial activity categories specific to cultural heritage. This gap can be addressed by taking advantage of established national accounting systems to develop tailored methodologies for Satellite Accounting.

The development of methodologies for Culture Satellite Accounts (CSA) is ongoing, with several European countries, including France, Spain, Netherlands, etc., establishing their own accounts for Culture and Creative Industries Satellite Accounts. While these initiatives vary in defining cultural activities and the information provided, the EUIPO's proposal aims to standardize efforts across nations (EUIPO, 2019). CSAs represent a significant advancement in quantifying the economic value of the broader cultural sector, although challenges remain in measuring the specific and detailed contributions of material cultural heritage, which, from the CSA perspective, constitutes only a small component of the overall cultural sector. Recent discussions, such as those at the ESPON 2030 event[7], emphasize the need for a dedicated material cultural heritage satellite account to enhance understanding of its economic contribution and support informed policymaking.

Aligned with the overarching objectives of the HERMES project, this report sets up the second Deliverable of the HERMES project: "Final report detailing the methodology of the material cultural heritage satellite account (D2)". To ensure consistency across countries for a comparable and reliable measurement of material cultural heritage economic contribution, this report describes the process followed towards the development of a methodology for the Material Cultural Heritage Satellite Account (HERMES SA) applicable for the different EU member states and partner states building on the conceptual foundations laid by previous initiatives.

To address such goal, several challenges have been tackled and their solutions constitute the main components of this report:

- **Reviewing the main frameworks and methods:** To define and delimit the cultural heritage sector, various references have been compared, identifying not only similarities and differences in assessing the economic contribution of material cultural heritage (either as a sector or as part of broader sectors) but also new opportunities for improvement to constitute a solid foundation for designing the HERMES SA.
- **Establishing the delimitation of the material cultural heritage sector** helps to ground the foundational building blocks of the HERMES conceptual framework which redefines the material cultural heritage sector by introducing the functions of its value chain with a focus on identifying, preserving, transmitting, and making heritage accessible, ensuring its values are safeguarded for future generations. The value of this framework lies in its capacity to systematically constitute a solid foundation for the identification of the activities in each function of the value chain.
- **Deploying the methodological proposal of the HERMES Satellite Account** by adopting the special sector accounts approach. This account represents an invaluable tool for describing and quantifying the economic activities directly associated with material cultural heritage (MCH). The key outputs of the HERMES SA include a supply table tailored specifically to the MCH sector, including detailed information that enables the reproduction of both the production account and the income generation account for the sector as a whole and for each of its key industries. Additionally, HERMES SA proposes the estimation of the value of certain activities not included in the central framework of national accounts, such as the contributions made by volunteers to the dissemination of MCH through digital platforms, thereby expanding the production boundary relative to the established framework.

To address those challenging HERMES' project ambitions, the research begins by examining the current landscape of international and European socio-economic and political trends that support the cultural heritage

[5] https://archive.espon.eu/cultural-heritage

[6] https://archive.espon.eu/HERIWELL

[7] The material cultural heritage: operationalisation of diverse research outcomes for policy makers | ESPON

sector. This analysis aims to underscore the sector's role as a catalyst for economic development while highlighting the necessity for standardized statistics to accurately measure its contributions.

It is then followed by a thorough analysis of frameworks developed for the broader culture and creative industries, as well as those specifically focused on cultural heritage. These frameworks either identify key activities within the sector or propose methods for estimating its economic contribution. Both approaches frequently utilize the value chain concept to analyse and map the cultural and cultural heritage sector. Building on that review, a comparative analysis is conducted from a dual perspective. First, given the increased statistical focus on the cultural sector and the significant advancements made, the analysis emphasizes the utility of the aforementioned frameworks. These frameworks set the groundwork for an integrated and consistent statistical description aligned with the concepts of the Central Framework of National Accounts (CFNA). Second, to delineate the material cultural heritage sector within the scope of the HERMES project, the frameworks were evaluated based on their proposals for structuring its value chain. Consequently, both similarities and key differences are thoroughly examined to integrate and adapt these insights into the HERMES conceptual framework.

Building on these valuable insights, the research continued with HERMES' proposal for the delimitation of the material cultural heritage sector, which aims to redefine the sector by adapting the value chain to reflect the specific functions and activities essential to material cultural heritage. The HERMES sector delimitation has been conceptualised to emphasize the identification, preservation, transmission, and accessibility of heritage to safeguard its values for future generations. It acknowledges the sector's integrated and non-hierarchical nature, focusing on defining core activities for a list of functions rather than adhering to a traditional hierarchy. Furthermore, its foundation lies in the fact that activities within each function can vary depending on the type of cultural heritage (movable, immovable, or cultural landscape). Besides, it intends to ensure clear definitions tailored to its objectives, allowing for national interpretations and ensuring it is comprehensive and adaptable to diverse heritage contexts. Finally, it integrates the digitalization perspective as a key factor intersecting with different heritage categories, supporting preservation and fostering wider appreciation.

Having conceptualised the framework to delimit the MCH sector, the research starts the design process of HERMES SA. From an operative perspective, it has been designed to estimate macroeconomic aggregates that describe the size and internal composition of the MCH sector, create detailed production tables for MCH-associated industries (including Gross Value Added (GVA) and Intermediate Consumption (IC)), provide information on sector employment, and ultimately, serve as a framework for collecting additional information, not necessarily economic, according to sector-specific categories and classifications. HERMES SA adopts a supply-side approach, focusing on value creation in specific industries rather than on expenditure by institutional units or financing methods. In addition, its principal purpose is descriptive, providing detailed estimates of economic activity with MCH by industries avoiding estimations of their indirect or induced effects on other industries. These two characteristics will distinguish HERMES SA from other similar operations in the field of satellite accounting and it initiates the path towards more comprehensive estimates that measure the effect of these activities on other industries.

Thus, the design process firstly tackled identifying and classifying the economic activities associated with the presence of MCH. Such identification is based on the classification provided by NACE Rev. 2.1. and the corresponding input-output branches (from IOF) all together summarised in a tailored matrix. Secondly, two modules were proposed for HERMES SA to present the information related to the MCH sector. The main module provides economic information, including the value of production, Gross Value Added (GVA), and other national accounting aggregates. It also includes employment information associated with the sector's activities. The second one, conceived as a complementary module, which is suggested to be developed by entities responsible for MCH, provides information on the stock of certain cultural heritage elements in a specific country or region such as historical buildings and institutions managing MCH-related activities (e.g. museums or libraries).

The design process of HERMES SA culminates in the estimation procedures of the main magnitudes (output, GVA, employment) associated with the HERMES key industries, described in the supply table based on an estimation of the internal composition of the IOF industries. For HERMES key industries, the procedure for estimating their production (output) and GVA is based on two phases:

1) The **application of 'Coefficient 1'** for estimating the part of each IOF activity branch that corresponds to the NACE class in which each *key industry* is located. According to the delimitation of HERMES key industries, it is necessary to apply coefficient 1 in all of them to estimate their main aggregates (production, GVA, employment, etc.). This coefficient can be obtained, in the absence of a better method and with the corresponding precautions, from the internal composition observed in Structural

Business Statistics (SBS) of production, GVA, or employment in the different NACE classes that make up each IOF branch by aggregation.

2) The **application of 'Coefficient 2'** for estimating the part of a specific NACE class that corresponds to a specific *key industry*. The application of the second phase is only necessary, as established in Chapter 5, for those key industries whose definition does not cover the entirety of a NACE class, but only a part of it.

To complement the HERMES SA methodological approach, **a list of procedures** has been elaborated for support calculations needed for those key industries requiring estimations that go beyond the application of coefficient 1, that is, requiring coefficient 2. Several aspects require attention to understand the foundational reasoning behind them:

- The sources for these calculations vary but share a common criterion: providing homogeneous information across most European countries or regions.
- The procedures serve as a non-prescriptive guide for Satellite Account managers, who can adapt them to their local contexts.
- Effective calculations require determining the baseline population of Material Cultural Heritage (MCH) based on established categories and definitions. Therefore, estimation procedures include the specific population baselines for key industries.

The design process was complemented with stakeholder consultations which, as a systematic process, aimed to gather diverse perspectives and insights to enhance partial and final results of the methodology proposed, ensure transparency, and foster collaborative relationships. Relevant stakeholders were invited to two consultation meetings: one for a preliminary methodological approach consultation, held on November 21st, 2024, and another for the validation of the fully developed HERMES SA methodology, held on December 17th, 2024 (see Annex 1 – Stakeholders' consultation meetings). To foster stakeholder engagement, a clear participation scheme was defined, detailing the degree of involvement (attendance at two online meetings to provide specific feedback on the presented products) and review of shared documentation. Previous to both meetings the draft of the main reports produced were sent to the participants two days in advance to facilitate a more precise and productive discussion.

During the preliminary consultation, conducted in a virtual meeting mode, the conceptual framework for the HERMES SA and the delimitation of the material cultural heritage sector together with its economic activities were presented and contrasted with expert stakeholders in the field. After the presentation of the HERMES project's progress and results, a fruitful debate emerged around key aspects of the methodological approach that contributed to improving the conceptual framework and to precise better the activities considered. Among others, the debate on digitized versus digital heritage (being hard to define) reinforced the idea that digitisation should support all value chain functions; similarly, governance, management, education and volunteering functions should be transversal to all functions; and, the recommendation of including some estimation methods together with an inventory of data sources at European level. The second stakeholder consultation was held in a similar structure. The changes adopted after the previous consultancy were explained to the attendees and the results of the design process for HERMES SA were shown. This second consultation resulted in valuable insight to improve the structure and some contents of the final report. Concerning the number of heritage items and related density, the National databases on heritage listings, including national heritage buildings/sites, are the most accurate approach as well as building demographics from national geographical institutes; and a variety of possible complementary data sources were provided by experts that complemented the work developed. Additional feedback was collected in written form, from stakeholders who were unable to attend meetings.

The organization of this report is designed to facilitate a clear understanding of the key findings and recommendations derived from the research conducted in this first deliverable; therefore, it is outlined as follows:

**Section 1 – Introduction**: it describes the main characteristics of this study. It provides a summary of the political context supporting the cultural heritage economic valuing process, the objectives and scope, the operational approach as well as the structure of the report.

**Section 2 – Need and purpose of a material cultural heritage satellite account**: it outlines the evolution of European policies that support the cultural heritage sector by establishing frameworks to enhance its economic, social, and environmental impact while advocating for a material cultural heritage satellite account to ensure effective preservation and funding.

**Section 3 – Existing approaches and methods**: this chapter summarizes the analysed frameworks, emphasizing their main contributions and key aspects of activity classification while evaluating their practicality for developing a material cultural heritage satellite account. The evaluated approaches are the UNESCO Framework for Cultural Statistics (UNESCO FCS), the ESSnet-Culture framework (ESSnet-Culture), the European Commission's report "Mapping the Creative Value Chains – A study on the economy of culture in the digital age" (EC CCS), the ESPON HERITAGE framework, the Conceptual Framework for Flanders Immovable Heritage Satellite Account (FLANDERS SA), the CHARTER Project (CHARTER) and the Satellite Account for the European Union Creative Industries (EUIPO).

**Section 4 – Conceptual framework for the material cultural heritage sector –** This chapter outlines the HERMES conceptual framework and describes its main components. It proposes to adapt the value chain of the material cultural heritage sector to its unique functions and activities, emphasizing preservation, accessibility, and the sector's integrated, self-sustaining nature across diverse typologies. A set of its core functions that capture the unique activities characteristic of the material cultural heritage sector is described in this section (based on three main typologies: movable, immovable, and cultural landscape).

**Section 5 – Proposal for a Material Cultural Heritage Satellite Account (HERMES SA).** This chapter includes the supply table restricted to the activities of the HERMES key industries which becomes the primary source of information for HERMES SA. The chapter starts by providing some clarifications to the conceptualisation, objectives and the foundations of HERMES SA designed to estimate macroeconomic aggregates. Then, the design process involves identifying and classifying economic activities associated with presence of MCH, based on NACE Rev. 2.1. and input-output branches (IOF). The structure proposed to HERMES SA is followed with the tables that represent its two constituting modules. The chapter ends with the comprehensive approach of HERMES SA in estimating and describing the economic impact of the MCH sector.

**Section 6 – Estimation procedures**: This chapter focuses on providing detailed information of the methodologies and procedures designed to support calculations needed for the HERMES key industries. After presenting the list of HERMES key industries classifying those which require estimations that go beyond the application of coefficient 1 requiring coefficient 2, the baseline populations of Material Cultural Heritage (MCH), established by the categories and definitions in the HERMES conceptual framework, is described. Aiming to create a universally applicable methodology for comparable data across countries, this baseline should be determined to address collectively multiple key industries. Every subchapter includes the estimation procedures for HERMES key industries including their corresponding NACE class, diverse sources for calculations, ensuring they provide homogeneous information across most European countries or regions, as well as local databases, statistical sources, and institutional realities, estimation techniques and data source identification to facilitate sub-national data breakdowns at the NUTS 3 level, ensuring detailed regional analysis.

**Section 7 – Conclusions and further research**: Several and relevant conclusions are integrated in this chapter that reflect the interesting and fruitful insights derived from the research conducted and how the critical barriers have been solved. In addition, the debate of the feedback provided by these stakeholders has enriched and complemented the proposed content. Challenging opportunities for advancement in the development of a satellite account of MCH and potential future research lines to ensure practical implementation are delineated.

# 2 Need and purpose of a Material Cultural Heritage Satellite Account

Widely acknowledged, the cultural heritage sector has become an essential part of Europe's economic landscape and policy frameworks, playing a pivotal role in social and economic development beyond its intrinsic value. In the context of European policy, the evolution of the cultural heritage discourse has been examined in various research studies (e.g. Light, 2011; Vecco, 2010)[8], as well as in projects like Cultural Heritage Counts for Europe (Jagodzińska et al., 2015) and the CHARTER project (Charter project, 2021). The early 1990s saw a recognition of cultural heritage as a key element of European identity, leading to the establishment of funding programs for conservation projects (Art. 167 of the Treaty on the Functioning of the European Union). A new focus on sustainability and inclusive heritage emerges in the policy context emphasizing a holistic view that integrates both tangible and intangible heritage which is formalized in the Faro Convention (2005)[9]. It redefined heritage to include community involvement and sustainable management as well as emphasized the connection between cultural heritage, social cohesion, and sustainable development. This value-led approach took a significant step forward with the EU Council's official recognition in 2014[10] which emphasized the cross-policy impact of cultural heritage as it intersects with various public policies, including regional development, social cohesion, and education. The key messages from the EC are compiled in the report "Towards an integrated approach to Cultural Heritage for Europe" (EUROPEAN COMMISSION, 2014) which presents a strategic outline of how cultural heritage should be valued and supported as a resource for social, economic, and environmental sustainability within the EU. Furthermore, it underscores cultural heritage as a multidimensional asset, vital to both individual and collective identity.

The consolidation of value-led discourse is marked by recent EU instruments fostering European policy support initiatives and reflecting the dynamic evolution of the modern concept of cultural heritage as it adapts to global trends and continuously incorporates new dimensions. The 7th Framework Programme for Research and Technology allocated funding for projects focused on the protection, conservation, and enhancement of cultural heritage. Additionally, the Joint Programming Initiative on Cultural Heritage and Global Change has also been active, helping to streamline and coordinate national research programs. The European Year of Cultural Heritage (2018)[11] promoted heritage as a bridge between the past and future, emphasizing its role in economic growth, social inclusion, and sustainability. It showcases how cultural heritage contributes to European values such as democracy, human rights, and diversity. More recently, Horizon 2020 supports initiatives aimed at the care, preservation, and accessibility of cultural heritage like the New European Bauhaus (2020) which connects cultural heritage with sustainable living, environmental resilience, and inclusivity, affirming the economic and social values of heritage in the EU's Green Deal. It represents a forward-thinking approach to heritage that respects traditional values while adapting them to modern needs, including climate action and digital transformation. Additionally, the European Heritage Hub[12] aims to promote, protect, and enhance Europe's cultural heritage. Launched under the framework of the Creative Europe programme[13], it is designed to, among other objectives, strengthen cooperation between various stakeholders in the cultural sector and to develop sustainable practices for preserving cultural heritage including the digitalization of heritage sites, adaptation to climate change, and the creation of digital archives to preserve Europe's cultural diversity.

In parallel with the significant transformation of the sector, which now includes environmental and social dimensions, International and European policies have also supported this evolution through prominent

[8] The material cultural heritage: operationalisation of diverse research outcomes for policy makers | ESPON

[9] Full list - Treaty Office

[10] Council of Europe (2014). Council conclusions of 21 May 2014 on cultural heritage as a strategic resource for a sustainable Europe, point 8. Available at: EUR-Lex - 52014XG0614(08) - EN - EUR-Lex

[11] Strategic framework for the EU's cultural policy - Culture and Creativity

[12] European Heritage Hub

[13] Home - Culture and Creativity

frameworks which provide similar categorizations of culture but each highlighting distinct aspects, including cultural heritage and creative industries (such as those from UNESCO (UNESCO-UIS, 2009b), EUROSTAT (EUROSTAT & EC, 2013), and EUIPO (EUIPO, 2019)).

The cultural heritage sector not only serves as a catalyst for economic development by creating jobs but also fosters investments that ensure heritage sites remain economically viable while preserving their historical significance. Cultural heritage can have a wide range of economic impacts, including direct, indirect, and induced effects, which can be difficult to separate and measure, partly due to a limited understanding of its economic role in the broader economy and lack of reliable data. **Valuing its economic contribution presents a significant challenge and requires the use of specialized and tailored methodologies**. At the international level, the development of basic statistics and specific methodologies for measuring the economic contribution of significant sectors like tourism, education, and health has preceded the systematization of cultural statistics. Key organizations, including UNESCO and UNCTAD, have played vital roles in defining the cultural phenomenon and its associated economic and social activities, being the UNESCO Framework for Cultural Statistics (FCS) one of the most referenced frameworks for cultural statistics (UNCTAD, 2010; UNESCO, 1986, 2024; UNESCO-UIS, 2009b, 2009a).

The statistical analysis of culture has historically received less attention compared to other social sectors, largely due to traditional views that regarded cultural activities as purely aesthetic and spiritual (UNESCO-UIS, 2009b). This neglect stemmed from among other factors, the perception that the economic analysis did not align with the essence of cultural activities, which were seen as public goods requiring government funding (UNESCO-UIS, 2009b). Since the 1960s, analysts and statistical production professionals increasingly recognised the connection between culture and the economy. Culture started to be considered as both a result of economic development and a driving force behind it, considered essential for economic reproduction rather than a luxury (UNESCO-UIS, 2009b). Additionally, in many developed countries, the cultural sector has become more economically significant, particularly in terms of employment, than some traditional industries, contributing notably to national export revenues (UNESCO-UIS, 2009b).

In the mid-1990s, the European Commission urged member states to develop cultural statistics to measure economic growth in the sector. Initiatives undertaken by the European Leadership Group in Culture Statistics (LEG) and the Woking Group European Statistical System Network on Culture (ESSnet-Culture) aimed to categorize cultural activities according to standard economic classifications (NACE Rev.2). The LEG, active from 1997 to 2000, recommended a core set of cultural domains and indicators for employment, financing, and participation. This was followed by the ESSnet-Culture (2009-2011), focusing on producing harmonized data within a more limited scope. Despite this difference, the ESSnet-Culture framework (ESSnet Culture, 2012) provides a practical method for creating standardized data on cultural activities. Eurostat has further built upon the foundational work of ESSnet-Culture, adopting and refining its methodology to produce comprehensive culture statistics, which are accessible through a database and various Eurostat publications[14]. The 2018 European Year of Cultural Heritage marked a significant turning point, catalysing a strong political commitment to preserve and promote cultural heritage through extensive programs and initiatives. The UNESCO Thematic Indicators for Culture in the 2030 Agenda[15] aim to measure the contribution of culture and creativity to economic, social, and environmental dimensions through a mixed approach of qualitative and quantitative indicators, which can be resource intensive. Similarly, the Cultural and Creative Cities Monitor[16] uses this mixed method to benchmark urban areas and promote mutual learning.

To gain a deeper understanding and quantify the broader impact of the cultural sector on society, the selection of activities included is not straightforward; it relied on practical considerations, particularly the availability of statistical classification codes. This study focuses on emphasizing the intrinsic value of **material cultural heritage**. Undoubtedly, the material cultural heritage significantly contributes to local and national economies through tourism, job creation, and infrastructure development but also requires ongoing conservation and preservation efforts, which necessitate significant investments. These efforts are intrinsically tied to the knowledge and skills associated with intangible cultural heritage, particularly in areas like traditional

[14] Overview - Eurostat

[15] World Heritage Centre - Culture|2030 Indicators (unesco.org)

[16] Cultural and Creative Cities Monitor

craftsmanship and historic crafts. This interplay between the tangible and intangible aspects of heritage is vital in ensuring sustainable conservation practices. Emphasizing these aspects highlights the economic and cultural importance of preserving cultural heritage for future generations, ensuring that the sector receives adequate funding and resources. While the focus of this study is on material cultural heritage, also known as tangible cultural heritage, it is essential to acknowledge the critical role of intangible heritage in supporting the maintenance and restoration of built heritage. Skills such as traditional craftsmanship not only preserve historic methods but also offer innovative approaches to addressing contemporary challenges. For instance, training and documenting these crafts, potentially through digital means, fosters knowledge transfer and ensures their survival.

Focusing on the concept of material cultural heritage, this includes a wide range of physical objects, structures, and sites of cultural significance. The project defines material cultural heritage using the categories outlined in UNESCO's definition[17] of tangible cultural heritage. Although the terms "material" and "tangible" cultural heritage are often used interchangeably, "material" emphasizes the physical composition and existence of heritage, whereas "tangible" encompasses a broader understanding of the cultural significance associated with physical objects or places. To better distinguish the concept of cultural heritage in relation to the culture satellite account, the term "material cultural heritage" has been deliberately chosen, which includes:

- **Cultural Heritage Sites and Assets**: including monuments, buildings, structures, sites, and landscapes of historical, architectural, artistic, anthropological, ethnographical or cultural significance—such as temples, churches, castles, historic centres, vernacular architecture, cultural landscapes, and archaeological sites.
- **Artifacts and Objects (Movable Cultural Heritage)**: This encompasses a variety of items, including fine arts, decorative arts, ethnographic collections, historic industrial machinery, archaeological objects, archival materials, and manuscripts.

Although considering material cultural heritage as an economic sector may be controversial it enables the description of economic flows and the measurement of the value added by the sector. Acknowledging its economic significance does not undermine its intrinsic worth; rather, it supports effective management and preservation for future generations. As highlighted by the ESPON HERITAGE project[18], despite the efforts to enhance cultural heritage statistics, such as those addressed by the Economic Task Force of the European Heritage Heads Forum[19], fully capturing its economic and societal impact remains elusive. Additionally, standardized quantitative data, including EUROSTAT figures, provide only a limited view of cultural heritage's economic significance. They concluded that the contribution of cultural heritage to society—through value creation, job skills, employment, and quality of life—is often underestimated (ESPON HERITAGE, 2019). The CHARTER project[20] highlights that several examples of European countries, illustrating that establishments operating in the heritage sector are not registered under NACE Division 91, exist. Instead, they are dispersed across various NACE categories, often excluded from cultural statistics. The project therefore underscores the necessity to refine NACE codes, enabling heritage sector enterprises to register under a heritage-specific code or to have their cultural contribution acknowledged when they are registered as non-cultural. Such enhancements should capture the diverse and extensive activities within the heritage sector (Marçal & Mignosa, 2024).

National interests in developing reliable estimates to measure the economic contribution of heritage also are increasing. Recently, the UK Department for Culture, Media and Sport (DCMS) identified a significant challenge concerning the heritage sector, which is crucial for cultural preservation and historical appreciation, but it lacks a formal definition. DCMS commissioned Alma Economics to develop a feasibility study of different approaches to create an estimate of heritage contribution to the economy (ALMA ECONOMICS, 2024). As a result, the study suggests a temporary short-term adaption of an existing approach to move towards a heritage satellite account in the long term, to ensure a robust method able to capture the full sector's economic contribution. In the same line, the Centre for Economics and Business Research conducted a study for Historic England, evaluating the economic contributions of England's heritage sector to the UK economy (CEBR, 2024). The direct, as well as indirect and induced impacts are estimated, in terms of employment and GVA.

[17] Cultural heritage - Glossary - UNESCO World Heritage Centre

[18] ESPON HERITAGE

[19] Home - European Heritage Heads Forum

[20] Home CHARTER - European Cultural Heritage Skills Alliance

One of the challenges in measuring the economic weight of the material cultural heritage sector lies in the fact that the delimitation of this sector cannot be carried out using the standard concepts provided by National Accounts. This issue is not exclusive to material cultural heritage, but it also affects other sectors of economic and social reality that are particularly relevant. The solution involves developing specific methodologies that adapt National Accounting criteria to create tailored classifications and valuation methods. This approach, known as Satellite Accounting, is backed by established National Accounting Systems such as the System of National Accounts -2008 (EC et al., 2009) and the European System of Accounts -2010 (EUROSTAT & EC, 2013).

In general, Satellite Accounts (SAs) are statistical operations linked to the Central Framework of the National Accounts (CFNA) that modify existing tables to meet specific data needs (EUROSTAT & EC, 2013). They are useful for detailing economic activities that standard classifications cannot adequately capture. When public interest justifies it, SAs can provide several advantages, including greater detail in sector descriptions, expansion of the accounting framework to include non-monetary information and modification of basic concepts to measure specific phenomena of interest (EUROSTAT & EC, 2013). According to EUROSTAT & EC (2013), SAs can meet specific data needs by offering more detail, rearranging concepts, or providing supplementary information. They retain the basic concepts of the central framework, allowing for consistent linkage to the overall economy using well-established concepts like production and taxes. Satellite Accounts share one or more of the following characteristics:

- Links to functions, as seen in functional satellite accounts;
- Links to industries or products, which represent a type of special sector accounts;
- Links to institutional sectors, another type of special sector accounts;
- Extensions that include physical or other non-monetary data;
- Additional detail;
- Use of supplementary concepts;
- Modifications of some basic concepts;
- Use of modelling or inclusion of experimental results.

Satellite Accounts can be classified into three groups:

- **Thematic Satellite Accounts**: Focus on providing detailed information about specific sectors using national accounting concepts, often without significant changes to basic concepts.
- **Accounts Extending the Central Framework**: Modify basic concepts and expand the production boundary.
- **Mixed Satellite Accounts**: Combine elements of the first two types.

The Tourism Satellite Account (TSA)[21] is an example of the first group, while Household Production Account[22] serves as an example of the second group, as it disregards the limits imposed by the Central Framework on household production. In the Central Framework, only the services of owner-occupied dwellings, agricultural production for personal consumption, and self-construction of dwellings are typically counted. In contrast, Household Production Accounts encompass *"two major types of household activity: unpaid services by household members consumed within the same household, and volunteer service"* (EUROSTAT & EC, 2013, p. § 22.89). An example of a mixed satellite account is the Creative Industries Satellite Account developed by EUIPO[23]. It aims to capture detailed information about the satellite industries and proposes methods for measuring the added value generated by volunteer work and specific intermediate consumptions, such as those associated with the production of advertising services for own use.

The design of methodologies for Culture Satellite Accounts (CSA) is an ongoing process. Several European countries, including France, Spain[24], Italy, Belgium, Austria, Denmark, Finland[25], Sweden, Croatia, Slovenia, and

[21] Tourism Satellite Accounts in Europe – 2023 edition - Eurostat

[22] Database - Eurostat

[23] Home - EUIPO

[24] INEbase / Economy /Economics accounts /Spanish Tourism Satellite Account / Latest data

[25] Culture satellite accounts | Statistics Finland

Netherlands[26] have established their own Cultural or Creative Industries Satellite Accounts. Some of these initiatives are well-established, while others are more recent. However, national proposals vary in defining cultural activities, basic concepts, and the type and extent of information provided. The methodological proposal from the European Union Intellectual Property Office (EUIPO, 2019) could help standardize efforts across countries, although it is recognized as highly ambitious and challenging to implement given current data availability.

The development of CSAs in Europe represents a significant step forward in recognizing and quantifying the economic value of the cultural and heritage sectors. While CSAs provide a comprehensive view of the cultural sector's economic contribution—including various activities such as intangible cultural heritage, creative industries, and cultural services—they also face challenges in pinpointing the specific economic contributions of material cultural heritage. Therefore, further research is essential to establish a unified methodology for National Satellite Accounts across Europe, which will necessitate substantial international collaboration. In this line, progress has been made in designing a specific Satellite Account for material cultural heritage. The ESPON 2030 event in June 2023 *("The material cultural heritage: operationalisation of diverse research outcomes for policy makers"*) encouraged participants to discuss the urgent need for meaningful cultural heritage statistics, drawing on insights from past ESPON projects. A key proposal was to establish a material cultural heritage satellite account. This account would provide a clearer understanding of cultural heritage's economic contributions, serving as a more reliable alternative to current proxy estimations. As a result, the main highlights emphasize the benefits of developing a SA: i) would facilitate robust, standardized data collection, aligning with national statistical institutes; ii) would expand and refine the conceptual framework from the ESPON HERITAGE project; iii) the Eurostat expert group, representing all EU Member States, could enhance harmonization in cultural statistics, similar to existing Tourism Satellite Accounts; and, iv) would incorporate the territorial aspects of cultural heritage, highlighting its role in national wealth and economic development, thus aiding in informed policy-making. Notable work has been done to measure the economic impact of cultural heritage (e.g. ESPON HERITAGE, 2019; FLANDERS, 2019). The Cultural Satellite Account (CSA) created in Flanders (Vanhoutte, 2019) is an economic tool that provides a comprehensive way to measure the economic contribution of the cultural sector. Based on a framework similar to the broader national accounts, this CSA quantifies the value of culture by examining various cultural domains, including performing arts, visual arts, heritage, literature, and audio-visual sectors.

To sum up, the European policy landscape has evolved to support the cultural heritage sector's transformation by establishing various frameworks that address its economic, social, and environmental dimensions. These frameworks facilitate the coordination of policies, protect intellectual property, and highlight the sector's role as a catalyst for economic development, while also emphasising the need for standardized statistics to accurately measure its contributions. Given the substantial economic contribution of material cultural heritage on local and national economies—through tourism, job creation, and infrastructure development—along with the necessity for ongoing conservation efforts, there is a strong demand for establishing a material cultural heritage satellite account. This account would provide standardized data, enhance investment effectiveness, and deepen the understanding of cultural heritage's contributions to society, ensuring that adequate funding and resources are allocated for its preservation.

[26] Satellite account for culture and media 2018 | CBS

# 3 Existing approaches and methods

Developing a methodology for a material cultural heritage satellite account requires the analysis and integration of existing methodologies for defining and delimiting the sector. The frameworks analysed in this section vary in their objectives and two main overarching approaches can be distinguished for setting the boundaries of material cultural heritage: i) frameworks developed for culture and creative industries broader sectors or statistical systems where cultural heritage is a limited component, often associated with a single cultural domain (UNESCO FCS; ESSnet-Culture, EUIPO, EC CCS); ii) heritage-specific frameworks which focus solely on cultural heritage, either identifying its activities or proposing methods for estimating its economic impact (ESPON HERITAGE, CHARTER, FLANDERS SA).

Both approaches often rely on the value chain concept to analyse and map the cultural or cultural heritage sector. This chapter provides a summary of the frameworks analysed, highlighting the main contributions and key aspects of activities classification, while assessing their utility for the development of a material cultural heritage satellite account based on their degree of pragmatism. While diverse and sometimes incompatible, these existing approaches offer a valuable foundation and insights into designing the HERMES SA conceptual framework.

## 3.1 Culture frameworks

### 3.1.1 The 2009 UNESCO Framework for Cultural Statistics (UNESCO FCS)

The 2009 UNESCO Framework for Cultural Statistics (UNESCO-UIS, 2009b), hereafter UNESCO FCS, was designed to provide a comprehensive and adaptable approach to measure the different cultural activities, goods, and services, acknowledging the complexity of the sector and the need to balance international comparability with national and regional specificities. The framework is based on the definition of culture from UNESCO's Universal Declaration on Cultural Diversity, which recognizes "*culture as the set of distinctive spiritual, material, intellectual, and emotional features of society or a social group, and that it encompasses, in addition to art and literature, lifestyles, ways of living together, value systems, traditions and beliefs*" (UNESCO, 2001).

The UNESCO FCS is founded on the concept of the cultural domain, which encompasses not only formal industries but also informal and social activities. This broad perspective acknowledges that culture is not solely the product of economic activities but also social and non-formal or non-market related activities. By considering both the tangible and intangible aspects of culture, the framework provides an overall understanding of the complex relationships between cultural activities.

The UNESCO FCS identifies the following core cultural domains, which provide a structure for understanding and measuring cultural industries, activities, and practices:

- **Cultural and Natural Heritage**: museums, archaeological sites and historical places, cultural landscapes, and natural heritage.
- **Performance and Celebration**: performing arts, music, festivals, fairs and feasts.
- **Visual Arts and Crafts**: fine arts, photography, and crafts.
- **Books and Press**: Books, newspapers and magazines, other printed material, libraries, and book fairs.
- **Audio-visual and Interactive Media**: film and video, TV and radio, internet podcasting, and video games.
- **Design and Creative Services:** fashion design, graphic design, interior design, landscape design, architectural services, and advertising services.

And, as transversal core cultural domain:

- **Intangible Cultural Heritage**: oral traditions and expressions, rituals, languages, and social practices.

The UNESCO FCS identifies these domains as the fundamental components of the cultural sector. In addition to these, it includes three transversal domains that cross and apply to all cultural domains:

- **Education and Training:** Transmission and acquisition of values and skills between generations.

- **Archiving and Preservation:** The collection, repository, conservation, and management of cultural forms.
- **Equipment and Supporting Materials:** tools of cultural products and activities concerning supporting industries and ancillary services.

Furthermore, two additional related domains are mentioned, which represent sectors that have cultural elements but are not solely cultural activities:

- **Tourism:** demand-driven, consumer-defined activity linked with all cultural sector's domains.
- **Sports and recreation:** *Activities related to sports, physical fitness and well-being and physical recreation or activities undertaken for pleasure or relaxation that diverts, amuses or stimulates.*

To highlight the interconnectedness of cultural activities and processes, the framework presents the culture cycle, previously introduced by the 1986 UNESCO FCS, as a five-stage cyclical model that maps the various phases of cultural creation, production, and dissemination. This approach replaces the traditional hierarchical model, allowing to capture all the contributory processes involved in creating, distributing, receiving, using, critiquing, understanding, and preserving culture, focusing on understanding the totality of activities and resources required to transform ideas into cultural goods and services.

The stages of the culture cycle are:

1. **Creation**: the originating and authoring of ideas and content and the making of one-off production.
2. **Production**: the reproducible cultural forms, as well as the specialist tools, infrastructure and processes used in their realisation.
3. **Dissemination**: the bringing of generally mass-produced cultural products to consumers and exhibitors.
4. **Exhibition/Reception/Transmission** refers to the place of consumption and the provision of live and/or unmediated cultural experiences to audiences by granting or selling access to consume/participate in time-based cultural activities. Transmission relates to the transfer of knowledge and skills that may not involve any commercial transaction and which often occurs in informal settings.
5. **Consumption/Participation:** the activities of audiences and participants in consuming cultural products and taking part in cultural activities and experiences.

The framework requires that each activity is classified only once, even if it naturally overlaps with or belongs to multiple domains. It also recognises that the cultural cycle phases may overlap or be skipped in certain cultural activities, or some phases may be merged or non-existent for a certain domain. This is for example the case of the cultural and natural heritage domain, where the creation phase is typically considered a past event and where activities tend to cluster around two key phases: 'Exhibition and Transmission' and 'Consumption/Participation', with transmission especially significant for intangible heritage. Even if the cyclical model reflects UNESCO's broadened vision of culture, overlapping phases may in some cases make challenging to distinctly allocate activities by each phase.

The UNESCO FCS is currently under revision, as a new release is expected in 2025. According to the available draft document (UNESCO, 2024), the new framework introduces three key innovations over its predecessors. It establishes a unified scope for cultural statistics and socioeconomic studies within the cultural and creative ecosystem, harmonizing concepts and statistical operations for enhanced data comparability. Additionally, it adopts a modular, context-sensitive approach that allows countries to tailor methodologies to their unique cultural contexts and resources. Finally, it is structured into two complementary documents: a conceptual framework defining the ecosystem of culture and a classifications guide for quantifying the cultural and creative ecosystem's contributions.

**SUMMARY OF MAIN CHARACTERISTICS**

- The 2009 UNESCO Framework for Cultural Statistics provides a pragmatic definition of culture. The culture cycle approach emphasizes the interconnectedness of cultural activities and the importance of considering both market and non-market activities.
- The concept of the culture cycle has been already used by some UNESCO Member States and aims to track all the activities needed to transform ideas into cultural goods and services.

- The cultural domains are mutually exclusive, and intangible cultural heritage is a transversal dimension, while phases of the culture cycle may overlap.
- It provides a structure for collecting comparative data but considers specificities and variability at national and regional levels.
- It is recognized that empirical data are not always readily available for all countries.
- To avoid double counting and considering that there is no internationally accepted definition of cultural tourism, tourism is considered as related domain.
- When referring to the cultural heritage domain, it is assumed that the majority of activities are related to exhibition transmission and consumption/participation phases, as creation may be said to have occurred in the past.
- The UNESCO FCS recognises the value of cultural heritage as a social good and suggests methods to estimate the value of activities occurring within heritage sites, such as revenue data from cultural sites based on attendance, and tourism expenditure, though limited by the difficulty of distinguishing between cultural tourism and general tourism and surveys.

### 3.1.2 The 2012 ESSnet-Culture (European Statistical System Network on Culture) Framework (ESSnet-Culture)

The ESSnet-Culture framework (ESSnet Culture, 2012), hereafter ESSnet-Culture builds upon the LEG-Culture approach, integrating some advancements and improvements in the culture statistic systems, providing a comprehensive and comparable European framework. The approach proposed revisits the existing LEG-Culture framework and compares it with the UNESCO FCS, enabling to define the scope of the framework and including or excluding some activities. The aim of this approach is therefore to establish more limited boundaries of the sector but produce a more practical concept based on NACE rev.2 classes for data collection.

Following the UNESCO FCS, the key principles in which the ESSnet-Culture is grounded are i) equal representation of the cultural domains, meaning that there is no prioritization of one domain over another and ii) the artistic creation as the core, acknowledging that creation is the foundation or primary feature of any cultural activity.

The ESSnet-Culture Framework is organized into ten cultural domains and six key functions, which are the following:

Cultural domains

- Heritage
- Archives
- Libraries
- Book & Press
- Visual Arts
- Performing Arts
- Audiovisual & Multimedia
- Architecture
- Advertising
- Art Crafts

Cultural Functions

- **Creation**: Elaboration of artistic ideas, contents, and original cultural products.
- **Production/Publishing**: Turning original works into available goods and services.
- **Dissemination/Trade**: Making created and produced work available to consumers.
- **Preservation**: Conserving, protecting, restoring, and maintaining cultural heritage.
- **Education**: Formal and non-formal education in the field of culture.
- **Management/Regulation**: Activities supporting cultural activities, operators, and spaces.

The ESSnet-Culture approach, to align with previous frameworks developed by LEG-Culture and UNESCO, graphically adopts the cyclical model but focuses on ensuring compatibility with existing standards and limiting the introduction of new cultural definitions. It adopts a minimal yet solid and realistic approach, based on common standards and existing classifications. The framework excludes some activities due to the need for quality

and availability of data, as well as the primary criteria for defining cultural activity (artistic and cultural expressions and values).

Concerning the LEG-Culture and UNESCO FCS, two notable additions were made: Advertising and Art crafts as new domains, and Management/Regulation as a new function. Key differences from the UNESCO FCS include the reclassification of auxiliary activities, such as education and regulatory activities, as functions.

Since its inception, the ESSnet-Culture has led to the creation of a cross-sectoral database on Eurostat, offering access to various culture-related statistics, presented in a dedicated section on the Eurostat website.

**SUMMARY OF MAIN CHARACTERISTICS**

- The ESSnet-Culture framework draws inspiration from UNESCO FCS but adapts it to the European context. It diverges by excluding natural heritage, sports, and tourism, instead focusing on 10 distinct cultural domains.
- It offers a practical approach to culture statistics, relying on established standards and classifications. To ensure data quality, it sets strict boundaries by excluding certain activities.
- The framework focused on existing European data sources and concluded that EU harmonized data collections were not appropriately covering cultural domains, resulting in a shortage of high-quality data.

### 3.1.3 The 2017 European Commission's Report on Mapping the Creative Value Chains (EC CCS)

The European Commission's report "Mapping the Creative Value Chains – A study on the economy of culture in the digital age"(European Commission. Directorate General for Education, Youth, Sport and Culture. et al., 2017), hereafter EC CCS, investigates how digital technology is reshaping the Cultural and Creative Sectors (CCS) in Europe. Digitization impacts every stage of the CCS value chain—from creation to consumption—bringing both challenges and opportunities. It enables new forms of audience engagement and introduces additional actors without eliminating traditional roles, adding complexity to the value chain.

The study uses a model to examine four main functions within CCS—creation, production, dissemination/trade, and exhibition/reception—and incorporates partnerships with other sectors for complementary goods and services. To capture the diversity within CCS and cover all the activities and actors included in the sector, the value chain analysis has been carried out at a sub-sector level, according to the following cultural and creative domains: visual arts, performing arts, cultural heritage, artistic crafts, book publishing, music, film, television and radio broadcasting, and multimedia. While digitization has affected all of these, it hasn't replaced existing roles but has introduced new ones, increasing overall complexity.

This study's baseline model builds on the ESSnet-Culture framework for analysing CCS value chains, but seeks to complement it with UNESCO's 2009 cultural statistics framework to capture a broader range of economic activities, such as manufacturing and ancillary goods and services, which are not fully represented in the ESSnet-culture framework. Considering that HERMES focuses on material cultural heritage, the analysis of this study has been focused on the cultural heritage value chain.

Cultural heritage occupies a unique position within the broader cultural and creative sectors, requiring distinct analytical and policy approaches. Unlike other sectors where new content is constantly created, cultural heritage often originates in the past, encompassing both tangible (e.g. buildings) and intangible elements (such as traditions). While heritage is publicly valuable, it often requires public investment for preservation.

Digitization has made cultural heritage more accessible, expanding audience reach through digital archives, online databases, and virtual experiences. Although in-person experiences remain essential to heritage value, digital access allows broader engagement and supports preservation and research.

Heritage recognition is driven primarily by protection rather than economic gain. Official heritage status protects cultural assets from market pressures, though it can also enhance their economic value by increasing their attractiveness for tourism and local development. The value creation process for cultural heritage comprises four key stages—Creation, Production, Dissemination/Trade, and Exhibition/Reception—each reflecting the unique economic and symbolic roles of heritage:

- **Creation:** formal recognition, which enhances symbolic value, attracts visitors, and supports local economic growth.

- **Production**: involves conserving and maintaining heritage, whether through physical upkeep or by facilitating public access.
- **Dissemination/trade and exhibition/transmission** engages the public through museums, festivals, and other events, contributing to both cultural and economic value. Museums generate income through ticket sales, merchandise, licensing, and space rentals, while alternative funding sources, like sponsorships and crowdfunding, help offset reductions in public funding. Commercialization of cultural heritage is related to arts and antiquities markets and real estate.

Heritage activities boost local economies, particularly through tourism and sustainable development. In addition to primary actors like museums, various supporting entities enhance expertise, security, and public access to heritage. These include research centres, professional organizations, and ICT specialists who drive digitization and public engagement, particularly through online and social media platforms.

The study outlines the key players in the cultural heritage value chain, examining both their roles in creating value and their interconnections. A major distinction exists between direct economic gains from cultural heritage, achieved through revenue-generating models by institutions like museums and heritage sites, and the broader role of heritage as a resource for tourism and local socio-economic growth. Although these institutions generate revenue, their primary mission is public: preserving and providing access to cultural heritage.

In analysing the market for cultural heritage, it is essential to recognize the dominant role of public entities, especially since a substantial portion of this sector relies on public funding across the value chain. Recently, new business models have emerged, driven by digital innovation, which enables museums and heritage sites to offer novel, distinct services and allows new types of entities to participate in the market beyond traditional, physical locations.

**SUMMARY OF MAIN CHARACTERISTICS**

- Considering the differences between heritage typologies and industrial organisation of the value chain, the study presents two types of mapping: one related to tangible immovable heritage and the other one related to tangible movable heritage.
- The study emphasizes that cultural heritage, often created in the past, has unique preservation needs and demands a tailored approach compared to other CCS areas.
- Digital technology transforms every stage of the cultural and creative sectors (CCS) value chain, introducing new roles, increasing complexity, and enabling broader audience engagement. New business models, including licensing and digital content, indicate changing approaches in heritage management.
- The study presents activities for each of the identified functions and divides them into core functions, support functions and ancillary goods and services.
- Besides the enumeration of the activities and their relation with the functions, the analysis gives large importance to the description of the involved actors, their roles and interrelations within the value chain.

## 3.2 Cultural heritage frameworks and methodologies

### 3.2.1 The ESPON HERITAGE Targeted Analysis Project (ESPON HERITAGE)

The "Material Cultural Heritage as a Strategic Territorial Development Resource: Mapping Impacts Through a Set of Common European Socio-economic Indicators" project (ESPON HERITAGE, 2019), hereafter ESPON HERITAGE aimed to quantify the economic impact of material cultural heritage over the past five years by establishing a set of comparable indicators to determine the influence of the sector on local and national economies.

The study ESPON HERITAGE was based on a value chain approach to identify dependent activities and their subsequent transactions. By considering various sectors, including archaeology, architecture, museums, libraries and archives, tourism, construction, real estate, ancillary goods and services, ICT, and insurance, the study concentrated the economic contribution into three primary indicators: employment, gross value added, and turnover. Additionally, the research has accounted for the value of heritage volunteering and public expenditure.

To establish a comparable baseline population of material cultural heritage, an operational definition has been adopted, which includes both immovable and movable heritage, recognized for its value through national and regional inventories and legally protected, listed heritage but not legally protected, and historical building stock. Nevertheless, to avoid double counting, only pre-1919 dwellings are counted, as listed and protected buildings

are often included in this category. The ESPON HERITAGE methodology involves applying coefficients (e.g. the percentage of buildings constructed before 1919) to determine the proportion of turnover, value added, or employment of a range of economic sectors (defined using NACE classes) that should be accounted within the MCH sector.

This research serves as a step towards the development of a common monitoring system for data collection, processing, and delivery across European countries and regions, performing a data collection in 11 selected countries and regions. Additionally, besides the target analysis, the project methodology has been applied in Sweden (ESPON SWEDEN, 2020), highlighting that cultural heritage sector constitutes around 1% of the GDP of the different countries analysed, mainly through two key sectors: tourism and buildings renovation.

As the study reveals the substantial economic benefits of material cultural heritage, it also underscores the importance of continued investment in the preservation and promotion of Europe's rich cultural heritage.

**SUMMARY OF MAIN CHARACTERISTICS**

- Material cultural heritage is defined differently across European countries, requiring a common operational definition. The project adopts a definition of material cultural heritage according to three types of recognition: listed and legally protected, listed but not legally protected and historical building stock. This last category considers pre-1919 dwellings, excluding listed and protected buildings to avoid double counting, but which may not reflect national traditions and legislation in all countries.
- The value chain approach has been adopted as theoretical exercise to identify economic sectors and activities linked to material cultural heritage.
- The project uses coefficients to estimate the economic contribution attributable to material cultural heritage, but alternatives are needed in some cases where these are not available.

### 3.2.2 The 2018 Conceptual Framework for Flanders Immovable Heritage Satellite Account (FLANDERS SA)

This study (Vanhoutte, 2019), hereafter FLANDERS SA, defines the conceptual framework for a satellite account that measures the direct economic impact of immovable heritage. This approach aims to identify the gaps that exist in the current data collection and address them in the future and focuses on the economic analysis of activities related to the conservation, management, development, and consumption of immovable heritage.

This study highlights several weaknesses in existing research on the economic impact of heritage. Firstly, natural heritage is often overlooked. Secondly, the focus is typically limited to direct cultural activities, neglecting the significant contributions of indirect related touristic activities, such as transportation and accommodation. Finally, the economic activities associated with immovable heritage are not adequately captured in national accounts, as they are not separately identifiable within existing classifications, such as NACE. Some studies attempt to estimate the economic impact of immovable heritage by analysing both the supply and demand sides. However, the demand side is often narrowly focused on tourism and recreational activities, not considering other potential uses or economic transactions, such as real estate. Furthermore, Flanders's proposal notes that existing studies are difficult to compare due to their significant methodological differences, and that collecting data is a challenge due to the lack of available statistics.

To analyse the sector, the study adopts the concept of the value chain, identifying the following main phases adapted to heritage: Creation, Production, Distribution and trade, Access exhibition, and Consumption. Additionally, associated with the sector, they also identify: Regulation management, and Research, education, and training. For each of these phases, they describe the functions and identify the main activities and stakeholders, which we summarize below.

- **Creation:** activities related to the recognition of the asset as heritage, both in terms of its declaration or legal protection and in the preliminary research of its heritage value (preliminary studies, inventories, publications, etc.).
- **Production:** this includes not only construction or development but also the maintenance and restoration of heritage. It encompasses everything from monument guarding to volunteer management, technical and historical consultancy, and more. In cases such as landscapes, it could include repair and maintenance work carried out or supervised by farmers, or in the case of archaeological sites, it may include gardening work as part of the site's preservation and maintenance.

- **Distribution and trade:** this includes activities of developers who purchase buildings, remodel or restore them, as well as sales carried out by real estate agents, and even the fees associated with notaries in relation to these transactions.
- **Exhibition and access:** activities that make immovable heritage (architectural, archaeological, and landscape) accessible and public. This includes dissemination activities and direct access (to the physical asset) or indirect access (temporary exhibitions, guided tours, inaugurations, or virtual publications).
- **Regulation management:** this includes activities related to the development and management of regulatory frameworks (including financing), consultancy (for example, by NGOs), and management tasks not included in the previous links.
- **Research, education, and training:** research (which may be linked to the creation phase), education, and training.
- **Consumption:** once heritage is created, produced, and made accessible, it can be consumed. Considering consumption as the use of a good or service to satisfy needs, the following types of use are considered: visits, meeting places, workplace, product/service production (in terms of tourism, journalism, audiovisual production -films for example-, or the agricultural production -food or raw materials- linked to cultural landscape…) or inspiration to new products (creative industries -games, architecture, advertising…-), recreation and relax, national identity building, place of living, place branding… Tourist consumption is usually divided into expenses within the attraction (entrance fees, guides, etc.) and expenses outside the attraction (transportation, accommodation, shopping, food, etc.). The consumption may be on site or virtual.

**SUMMARY OF MAIN CHARACTERISTICS**

- Instead of a top-down approach (from the classifications to the sector), it proposes a bottom-up approach (defining the classification from the sector).
- It provides a very comprehensive reflection on the value chain of immovable heritage (actors, activities, etc.) and the value generated by the sector.
- Its application in the short term is difficult due to the current lack of data.

### 3.2.3 The CHARTER Project (CHARTER)

The CHARTER project[27], hereafter CHARTER, funded under the Erasmus+ program, aims to redefine and improve the role of cultural heritage by aligning education with the evolving needs of this sector. For this, one of the primary objectives of the project was mapping and structuring the sector by developing a comprehensive model to outline the cultural heritage sector's scope, dynamics, and limits, grounded in established cultural, economic, and occupational frameworks (Charter project, 2021).

CHARTER aimed at creating a model that defines cultural heritage concerning existing frameworks and policies. This model seeks to be holistic, allowing for both economic and social impact assessments. The project performs a critical analysis of existing frameworks and value chain models used by UNESCO FCS, ESSnet-Culture, ESPON HERITAGE and the EC CCS. As a result, the main concern that arises from the study is that traditional models, such as value chains, are limited to economic metrics, as they apply rigid, linear frameworks that overlook the social, cyclical, and ecosystem-like nature of heritage, underestimating its role in shaping social norms, decision-making, and lifestyles.

CHARTER proposes an "ecosystem" approach that emphasizes the cyclical and interconnected nature of cultural heritage. This approach prioritizes human and social benefits over economic metrics, suggesting that cultural heritage is an interdependent ecosystem. In this model, cultural heritage comprises both tangible and intangible resources and emphasizes a balance of activities within a broader social context.

CHARTER's analysis highlights the limitations of current EU classifications, which reduce cultural heritage to specific typologies like museums or monuments and restrict broader cultural activities to supportive or

[27] Home CHARTER - European Cultural Heritage Skills Alliance

economic roles (e.g., tourism). The consortium finds that EU indicators for economic activity overlook the intrinsic social and environmental values of cultural heritage, focusing instead on quantifiable outputs and that improving data collection to better represent heritage's societal contributions is a critical need.

To better represent cultural heritage, CHARTER explored various models. The first one, referred to as the "Riga Model" received critiques for not fully capturing the dynamic relationship between people and heritage, or addressing the challenges heritage faces. Its visual representation of directional arrows was perceived as conflicting with its intended cyclical nature. Ancillary economic activities, while acknowledged as beneficial, were still seen as peripheral to the core of cultural heritage work.

The final proposed model represents cultural heritage as a "common good". The CHARTER Model emphasizes heritage's potential to enhance societal wellbeing, supporting findings like those of ESPON HERIWELL (Charter project, 2023). It suggests that social wellbeing is linked to participation in heritage, where the quality of interactions with inherited resources shapes perceptions of cultural and ecological changes. This understanding guides future resource management, recognizing heritage's role in shaping identity and belonging.

Three central functions were identified:

- **Recognition**: Activities related to identifying and formally protecting heritage.
- **Preservation and Conservation**: Actions to ensure long-term heritage safeguarding, including maintenance, restoration, and preservation of intangible heritage.
- **Enhancement and Use**: Efforts to make heritage accessible, comprehensible, and usable by the public.

Supporting these core functions are Research and development/education, Management and, Governance and policy making. Overall, these Functions cluster cultural heritage activities, grouping them within a framework that reflects the sector's complexity and interconnectedness. These Functions define roles and occupations by setting key objectives. At the operational level, jobs and tasks are described by the necessary skills and knowledge (Charter project, 2023).

**SUMMARY OF MAIN CHARACTERISTICS**

- Current economic indicators and linear models are inadequate for capturing the full value of cultural heritage. Reliable, comparable data across EU member states is necessary to better illustrate cultural heritage's contributions.
- An ecosystem model supports a more balanced and inclusive representation of cultural heritage, recognizing its interdependence with communities.
- The model views heritage as a circular process, where society continuously generates and consumes its own heritage, similar to an ecosystem. This soft-focus approach is intended to move beyond rigid boundaries, illustrating how each Function influences and supports the others.

## 3.3 Culture and Creative Industries Satellite Account

### 3.3.1 A Satellite Account for the European Union Creative Industries (EUIPO)

The first comprehensive proposal for a European methodology for the creation of Satellite Accounts for Culture and Creative Industries in Europe comes from the European Union Intellectual Property Office (EUIPO, 2019). The objective of EUIPO is to accurately portray the entirety of economic flows linked to creative activities through an accounting framework strongly tied to the Central Framework of the National Accounts (CFNA) established by EUROSTAT and EC (EUROSTAT & EC, 2013). Additionally, it aims to provide information on non-economic variables of the sector to better understand the foundations of its functioning and its weight in the overall economy and European society.

Although EUIPO refers to Creative Industries, it sometimes speaks of cultural industries. In fact, its sector delimitation is mainly based on what ESSnet-Culture proposed in 2012 for cultural statistics. Therefore, the main contribution of EUIPO is not found in the delimitation of the sector. In this aspect, EUIPO limits itself to identifying a series of activities that essentially coincide with those selected by ESSnet-Culture and linking them to a series of classes in NACE Rev.2.

In contrast, EUIPO elaborates in much more detail and depth the inclusion and valuation criteria that should be applied in its Satellite Account, occasionally deviating from what is sanctioned in the Central Framework of

National Accounts. Additionally, EUIPO exhaustively describes the information that a satellite account of the Creative Industries should provide.

EUIPO's contributions can be described around a series of criteria for accounting the production of creative services and the proposal of methods for estimating the value added by certain activities that, according to the methodology, are part of the domain of the creative industries:

- Firstly, EUIPO proposes accounting for the main and secondary activities of the characteristic industries (previously identified), but also the production of characteristic cultural services carried out by non-characteristic industries. However, the methodology lacks a clear identification of the sector's characteristic services.
- Secondly, EUIPO's methodology deviates from the criteria of the Central Framework of the National Accounts (CFNA) by considering part of the sector's production the value of auxiliary activities and capital formation carried out by non-characteristic industries. EUIPO specifically refers to advertising activities and the production of software for its own use.
- Thirdly, the methodology provides several methods for the estimation of free or subsidized cultural services, regardless of whether the activities from which they derive are financed through advertising, the acquisition of user data by the company offering the services, or voluntary work contributions by households. These practices are very common in the cultural domain, particularly the dissemination of audiovisual material via the internet, and there are no reasons to neglect them as part of the production of the creative industries. To incorporate these activities into the Account's domain, EUIPO is forced to make some adjustments to the basic accounting principles of the CFNA, thus interpreting that households also participate in production or that companies carry out social transfers in kind to households, a type of distribution operation that in the CFNA is exclusive to Public Administrations or Non-Profit Institutions Serving Households.
- EUIPO also proposes including in the cultural domain all activities regardless of their legal or illegal nature; in particular, it sanctions the accounting of all activities that involve the violation of intellectual property rights.

These modifications to the accounting principles with which the CFNA operates imply an expansion of the production boundary in the CFNA, placing the Satellite Account of the Creative Industries in the third group of Satellite Accounts, according to the classification of Statistics Canada (Statistics Canada and UNECE, 2019). This is a type of Satellite Account that combines two objectives: to describe in detail a thematic area (culture) and to modify the CFNA criteria to include in the scope of measurement activities that, while generating economic value, are not part of the GDP in the CFNA.

Finally, EUIPO is characterized by proposing a particularly ambitious range of Satellite Account results, including a complete sequence of accounts for all relevant institutional sectors, resulting in the following aggregates for each sector:

- Final consumption expenditure (P3); actual final consumption (P4) and social transfers in kind (D63) by-products
- Current transfers (D75)
- Disposable income (B6g) and adjusted disposable income (B7g)
- Gross fixed capital formation (P51g)
- Saving (B8g)
- Imports (P7) and exports (P6) both intra-EU and outside the EU

In conclusion, EUIPO's proposal is characterized by its ambition, which its authors openly acknowledge and justify by the interest in developing an integrated set of statistics in a crucial sector for the modern economy.

The EUIPO report states that "*some of the proposals included in this report require statistical information that is not available in all EU countries*" and proposes that "*next steps would involve carrying out a pilot project to set up a CISA in one or two EU Member States*" (EUIPO, 2019, p. 8).

## 3.4 Other approaches

Other references have also been reviewed for this study, which do not themselves constitute frameworks or methodologies but rather report on or analyse their practical application. This is the case with the ALMA ECONOMICS 2024 study (ALMA ECONOMICS, 2024), which, in the context of the UK, reviews different methodologies for the economic estimation of the heritage sector: dynamic mapping, SIC-SOC mapping, big data analysis experiences, and what it calls cultural satellite account experiences, among which the ESPON HERITAGE framework. These methodologies are not mutually exclusive and could even be complementary in their application. In the same regional context, the Centre for Economics and Business Research recently conducted a study for Historic England to evaluate the economic contributions and impacts of England's heritage sector in the UK (CEBR, 2024). This study explores the role of England's heritage in the UK economy, including data on its direct contributions to GDP and employment, as well as indirect impacts through supply chains and induced impacts from employee spending within the heritage sector. Among its findings, the study not only analyses the direct contributions to GDP and employment from the UK heritage sector but also assesses the indirect and induced multiplier effects of heritage sector activities. The analysis utilizes data from the Office for National Statistics and includes economic indicators for various industries classified under the Standard Industrial Classification (SIC) framework. It uses the SIC framework for economic data collection and mapping, employs Standard Occupational Classification (SOC) to map heritage sector occupations to SIC industries and estimates economic characteristics and impacts at national and regional levels. Finally, it uses in-house input-output models to quantify wider multiplier impacts from heritage sector activities.

Some applications of the satellite accounts methodology to the cultural sector have also been reviewed. This work has not been exhaustive, as it is understood that the applications of satellite accounts at the national level are not intended to propose an international methodology but to solve a practical problem specific to the context of each country.

From the reviewed cases, it is identified that they are mainly based on the UNESCO FCS and ESSnet-Culture frameworks. Among them are the satellite accounts of Spain, the Basque Country, Portugal, Finland, and the Netherlands.

In the application of the Spanish, Basque, and Portuguese accounts, an implementation of the value chain methodology proposed by UNESCO FCS is identified. The application of the value chain in the Spanish satellite account aims to identify specific economic activities for each intersection of domain and value chain function, following the UNESCO example. In this case, in the application to the heritage domain, the functions of 'creation,' 'manufacturing,' 'trade and distribution,' as well as auxiliary functions, do not have associated activities. In the case of the Basque account, due to the difficulties in separating activities among functions, the value chain has been simplified by merging the 'creation' and 'production' functions.

In the case of the Finnish and Dutch accounts, with the available information, it cannot be determined whether they have used the value chain approach.

Regarding the analysed scope, all of them can be described as cultural satellite accounts, but the Dutch experience broadens the scope of its SA by giving central relevance to media as well. In this satellite account, some sub-domains such as 'archives' or 'libraries' disappear as specific domains, while 'audiovisual' and 'media' are specifically incorporated, and 'education' is given a more prominent role by including it as a specific domain. Non-cultural activities such as shops or cafes associated with museums are also considered in the accounting of this SA. These activities could also be considered in other CSA applications, although they do not specify it in their methodologies.

Typically, a CSA aggregates cultural activities into broad categories, often allowing the intangible cultural heritage component to overshadow the economic contribution of material cultural heritage. This makes it difficult to fully appreciate the contributions of material cultural heritage within the broader cultural landscape.

## 3.5 Assessing Frameworks: Contributions, and Insights for a Material Cultural Heritage Satellite Account

### 3.5.1 Contribution of existing frameworks to the creation of a Material Cultural Heritage Satellite Account

In the past two decades, there has been increased statistical attention on the cultural sector. Significant advances have been made in the statistical definition of the cultural phenomenon, in delineating the characteristic activities of the sector, and in proposing a statistical framework that consistently reflects the reality of cultural activities, especially — but not exclusively — in their economic aspect.

Cultural heritage, and specifically material cultural heritage, has also received its share of attention, being object of special protection by European institutions (European Commission, 2014: 2) and, for its nature, acting as a driver of cultural activities (UNESCO, 2009) and as a catalyst for other economic activities, particularly tourism (ESPON, 2019).

The (European Commission, 2014) and (ESPON HERITAGE, 2019) have highlighted the need for more comprehensive and integrated data on the economic value of cultural heritage, as partial estimates are available and EU-wide data are lacking. Besides the efforts initiated by Eurostat to develop regular European statistics on culture, which aims to provide more comprehensive data, including on the heritage sector, to better understand the actual and potential role of heritage in policy development, there is a need to design a specific Satellite Account for material cultural heritage that would provide criteria for an integrated, consistent statistical description aligned with the concepts of the Central Framework of the National Accounts. The design of this methodology, however, cannot ignore the advancements that have been made regarding both the cultural sector as a whole and the more specific field of material cultural heritage. These advancements, briefly described in the previous section of this report, are diverse and not necessarily compatible; nonetheless, they represent a valuable starting point and a source of valuable experience. This section proposes an assessment of the utility of these contributions.

Assessing existing methodologies begins with the recognition that they pursue different objectives (or combinations of objectives). Some provide a set of concepts that aid in the understanding and delineation of activities within the cultural sector (UNESCO FCS; ESSnet-Culture) or in describing its value chains (EC CCS). Others pursue the same objective but with a slightly broader scope: creative industries (UNCTAD, 2010). A third group seeks to establish an integrated statistical system that describes the economic activities associated with the previously defined sector (EUIPO). Still, other frameworks focus exclusively on the cultural heritage sector, either to identify the activities that comprise it (CHARTER) or to propose methods for estimating its economic impact (ESPON HERITAGE).

Ultimately, all these frameworks offer valuable insights into the design of a Satellite Account for material cultural heritage. However, it is necessary to establish boundaries between groups and discern which can play a more prominent role as precedents for this Account.

A first classification distinguishes the frameworks linked to the broader sector of cultural or creative industries from those focused on the more specific realm of material cultural heritage. From the perspective of the utility of these proposals, it is essential to understand that the former give cultural heritage a very limited space, generally associated with a single cultural domain. This is the case, for instance, of UNESCO FCS, which defines six specific cultural domains along with four transversal domains, one of which is called “Cultural and Natural Heritage.” According to this perspective, the cultural heritage sector would be reduced to the activities conducted by museums, archaeological and historical sites, cultural landscapes, and natural heritage. Since the UNESCO FCS proposes empirical references for these activities based on international standard classifications of activities, the accounting for material cultural heritage would, under this criterion, be limited to activities classified under “Museum activities and operation of historical sites” and “Botanical and zoological gardens and nature reserves activities” in the International Standard Industrial Classification. It would also likely include a minor portion of the categories “Retail sale of second-hand goods” and “Creative, arts, and entertainment activities.”

This approach falls short when the objective is to provide a comprehensive and detailed representation of the economic flows linked to the existence, management, and influence of material cultural heritage. In fact, it induces a reflection on the difficulty of defining the material cultural heritage sector itself. Unlike the cultural sector, where activities comprising the sector can be defined by their own nature and a set of shared characteristics (creativity, potential for intellectual property rights protection, or connection to the traditional concept of arts),

the material cultural heritage sector can only be defined as the set of activities associated with the existence of a previously identified cultural heritage. From this perspective, considering the sector as the aggregation of activities conducted in museums, archaeological sites, and other similar institutions does not appear to be an adequate solution.

Another necessary classification of the antecedents for a Material Cultural Heritage Satellite Account involves assessing its degree of pragmatism. Determining how pragmatically the design of a statistical framework has been approached is not straightforward, nor can it be solved by merely referencing the intentions expressed by its designer. Thus, it is essential to establish some assessment criteria. The following three are proposed:

a) The extent to which the frameworks establish explicit empirical references for the conceptual categories of activities they propose. In this regard, the utility is greater if the empirical references used align with an international classification of activities, products, or occupations.

b) The extent to which the proposed framework is grounded in a robust economic accounting framework as internationally accepted and widely validated concepts of National Accounting.

c) The extent to which estimation procedures are proposed for accounting magnitudes associated with the sector, using data sources available in all or most of the countries to which the framework applies.

Table 1 provides an overview of the extent to which a selection of the reviewed frameworks meets the criteria. The first column ("sector scope") additionally indicates the sector for which each framework is proposed. The second column indicates whether the framework proposes its own sector delimitation or assumes an existing one.

## Table 1: Comparative analysis of the reviewed frameworks towards assessment criteria

| Framework | Sector scope | Sector delimitation | Link with standard economic activity categories | Link with standard product categories | Link with standard occupation categories | Concepts and principles of measurement | Satellite Account structure | Practical approach Methods for calculation and estimates |
|---|---|---|---|---|---|---|---|---|
| UNESCO FCS | Culture | Yes | Yes | Yes | Yes | No | No | No |
| ESSnet-Culture | Culture | Yes | Yes | Yes | Yes | Yes | No | No |
| EUIPO | Creative industries | Yes (adapted from ESSnet-Culture) | Yes | No | No | Yes | Yes | Yes (theoretically) |
| EC CCS | Cultural and creative sectors | Yes | No | No | No | No | No | No |
| ESPON HERITAGE | Material cultural heritage | Yes | Yes (not exhaustive) | No | No | No (or very unsystematic) | No | Yes |
| Flanders SA | Immovable cultural heritage | Yes | No | No | No | Yes (partially) | Yes | Yes (not very detailed) |
| CHARTER | Cultural heritage | Yes | No (EUROSTAT is used) | No | No (EUROSTAT is used) | No | No | No |

Sector delimitation is a feature shared by all frameworks, although in some cases this delimitation is not entirely original. UNESCO FCS is likely the most influential framework in this regard, as it sets the standard of dividing the sector into various domains while ordering the activities in each domain according to a value chain or cycle. However, as previously explained, the utility of UNESCO FCS is limited by the fact that its scope is directed at the entire cultural sector, which is substantially broader than material cultural heritage.

EUIPO also stands out among the rest, as it is the only framework that proposes the integrated structure of a Satellite Account. Additionally, this proposal is highly comprehensive, addressing almost all the elements that Satellite Accounts add to National Accounting (sector-specific classifications, modifications to certain accounting concepts to reflect the sector's particularities, a proposal for developing a complete sequence of accounts for each of the institutional sectors in the Central Framework of National Accounts, etc.). Particularly noteworthy is EUIPO's in-depth analysis of methods for estimating certain value-generating activities that are usually excluded from the Central Framework of National Accounts. Among these, the free dissemination of material cultural heritage through platforms such as Wikipedia or YouTube is especially noteworthy. Two characteristics hinder the utility of the EUIPO proposal from the perspective of the objectives of a Material Cultural Heritage Satellite Account. On one hand, its reference is the ensemble of Creative Industries. On the other, the authors at EUIPO explicitly caution that the current lack of statistical data hinders its implementation in most countries, recommending that the process of consolidating the methodology begins with a series of pilot studies.

Regarding the frameworks specific to cultural heritage, the Flanders SA is exceptionally thorough in terms of the sector's conceptual analysis, but it does not address with the same depth the methods that would allow estimation of the value of aggregates describing the economic and social dimensions of the sector. CHARTER suffers from the same issue: while its conceptual description of the activities associated with cultural heritage is extremely interesting, its economic accounting appears more challenging, at least when considering the limitations posed by the current development of cultural statistics.

In a certain sense, ESPON HERITAGE is the most pragmatic reference among those considered and the one best suited to the material cultural heritage sector. It provides a complete description of the sources and procedures that can be applied to estimate the value added by selected activity branches. Some features of the ESPON HERITAGE could be improved, particularly the imperfect relationship between the theoretical conceptualization of activities in the sector, and the final selection of the activity branches subjected to a statistical description. Another feature of ESPON HERITAGE's methodology requiring some revision is its reliance on Structural Business Statistics for estimating the economic variables associated with the selected branches. This choice implies that ESPON HERITAGE's estimates do not include the value of non-market production; and although the ESPON HERITAGE framework proposes accounting for public expenditure associated with material cultural heritage through other sources, integrating both types of sources generates issues. This is why ESPON HERITAGE relegates public expenditure accounting to a separate module called "Other Indicators".

In conclusion, the experience represented by each of the selected frameworks is invaluable as a precedent for a Material Cultural Heritage Satellite Account. However, none of them offers a complete and definitive solution for the statistical description of the sector, which justifies the specific efforts undertaken both to achieve a conceptual description of the sector and to advance its accounting according to the criteria and definitions of the Central Framework of the National Accounts and in line with the capabilities of existing instruments (primarily classifications) and statistical products.

### 3.5.2 Contribution of existing frameworks to the definition of material cultural heritage functions

To define and delineate the material cultural heritage sector within the scope of the HERMES project, the authors conducted a comprehensive review of current frameworks and their respective approaches to structuring the value chain. Functions and related key activities within these value chains were mapped, identifying both similarities and key differences, to integrate and adapt these insights into the HERMES model.

**Creation**: Across all frameworks analysed, the core concept is consistent, involving the **origination and elaboration of artistic or cultural content**. This shared understanding sees creation as the process of originating and authoring ideas and elaborating artistic or cultural content. UNCTAD (2010) further defines the cultural sector (and its products) as a subset of creative activities (and their products), positioning it as a sector inherently linked to "creativity". This idea is reflected in the emphasis on artistic and cultural production, as seen in the UNESCO FCS, ESSnet-Culture, and EC CCS frameworks. These frameworks focus on the development of cultural products and the elaboration of artistic ideas, highlighting the importance of artistic creation. However,

nuances exist in the application of creation to cultural products versus heritage. Following this perspective, and specifically addressing the cultural heritage sector, creation is understood as something that occurred in the past and consequently, the value linked to the original creation of heritage should not be counted as current production. Instead, the value associated with heritage recognition takes on importance when analysing frameworks specifically addressing cultural heritage, such as FLANDERS SA, ESPON HERITAGE and CHARTER, which transform the definition of creation to include the **recognition** and attribution of heritage value. This involves activities such as identifying, valuing, and conducting scientific reports or inventories, and highlights the importance of heritage-oriented perspectives. This emphasis on the complex process of creating value in heritage contexts sets these frameworks apart from the more traditional artistic-focused frameworks.

**Production**: The definition of this function across the different frameworks reflects distinct views on **how original works are transformed into available products**. The frameworks, while sharing a core understanding, diverge in their emphasis on certain aspects. For example, ESSnet-Culture and EC CCS use the distinction between reproducible and non-reproducible cultural products, which is reflected in the differentiation between 'production' (for non-reproducible cultural goods) and 'publishing' (for reproducible ones) in the value chain. However, in cultural heritage contexts, this idea of production expands beyond simple creation to include conservation, restoration, and advisory activities aimed at preservation, highlighting a distinctive characteristic of heritage production. Frameworks like ESPON HERITAGE and FLANDERS SA focus less on this segmentation and more on heritage-specific activities, especially maintenance and conservation of heritage properties. These sources treat activities like preservation and management as integral to the production function, emphasizing the role of a diverse set of professionals—from conservators to archaeologists—necessary for the continuity of heritage sites. CHARTER does not identify production as a function itself but identifies preservation and conservation as a core function. Moreover, these frameworks focus on activities and professionals directly tied to heritage preservation, underscoring the sector's specific requirements and the ongoing need for careful management and conservation.

**Dissemination/ Trade**: Involves **making cultural products accessible to the public through various channels**, from traditional retail to increasingly significant digital platforms. Dissemination encompasses both the communication and promotion of cultural goods, while trade is specifically focused on the commercial exchange of these products with minimal modification. Across frameworks, the shift to digital platforms has influenced both the heritage and broader cultural sectors, allowing for more direct consumer access to products like music and film, and reducing reliance on intermediaries. Digital dissemination has become especially prominent, as highlighted by UNESCO FCS, ESSnet-Culture and EC CCS, which all emphasize the growth of digital trade. This shift enables artists and producers to distribute cultural products directly to consumers through streaming and online purchasing, which has transformed traditional distribution methods and expanded access to global audiences. The more recent framework of EUIPO not only provides a detailed account of the digitization process and its impacts on the sector but also endorses the separate accounting of digital and non-digital products. While all frameworks agree on the role of both traditional and digital distribution methods in disseminating cultural products, differences emerge in the types of cultural products they address. ESSnet-Culture and EC CCS distinguish between trade and dissemination, with trade focusing on the direct sale of cultural goods and dissemination encompassing broader communication efforts. In the heritage sector, dissemination includes the specific promotion of historical sites and artifacts, involving a range of specialized professionals in marketing, communication, advertising, and digital engagement. For example, ESPON HERITAGE and FLANDERS SA consider marketing and communication strategies required to promote heritage attractions and hospitality services, employing social media managers, graphic designers, and communication experts to enhance public engagement. For trade, real estate transactions, where heritage properties are sold, or redevelopment projects are considered.

**Exhibition/Reception/Transmission** focuses on **making cultural experiences accessible to the public through live events, museums, and heritage sites, combining both physical and digital access**. This function is also seen as a means of transferring knowledge, particularly in the preservation and continuity of intangible cultural heritage. While all frameworks emphasize the importance of public accessibility, they vary in focus, especially around cultural consumption, digital dissemination, and revenues from exhibitions and cultural sites.

On one hand, UNESCO FCS and EC CCS highlight live cultural experiences—festivals, theatre, museums—as the primary means of exhibition, stressing audience participation and engagement in real-time, immersive settings. This approach primarily focuses on the cultural and educational value of exhibitions, where ticket sales may play a role, but the emphasis is on public interaction with the cultural content itself. On the other hand, ESPON HERITAGE and FLANDERS SA offer a broader approach to accessibility, incorporating both direct physical access (like museum visits and heritage site tours) and indirect digital access, such as virtual tours, online exhibitions, and published digital materials. ESPON HERITAGE also highlights the economic potential of the exhibition

and transmission function, noting that these activities are significant revenue sources for heritage owners, museums, and libraries. This framework reflects a more commercial perspective, contrasting with UNESCO FCS and EC CCS, which prioritize cultural and educational impacts over revenue generation.

**Consumption/Participation/Engagement** emphasizes the **connection between audiences and cultural heritage**, focusing on **active public involvement**. It facilitates cultural interaction through activities such as visiting galleries, exploring heritage sites, or engaging with digital exhibits. Although all references recognize the importance of public engagement, approaches vary, especially concerning digital tools, stakeholder inclusion, and social impact. CHARTER emphasizes a broader engagement, using digital tools and interactive platforms to involve multiple stakeholders in the heritage experience. This includes promoting heritage through online tours, virtual exhibits, and digital access to historical sites, reflecting a contemporary focus on digitalization. In contrast, UNESCO FCS centres on individual cultural consumption activities, such as reading, visiting physical galleries, or listening to the radio. While both sources highlight participation, CHARTER shifts the focus from personal engagement to community-wide interaction, promoting heritage as a resource for social impact and cultural understanding. Commercialization and economic aspects also appear differently. While UNESCO FCS includes participation in cultural products as part of broader consumption, CHARTER incorporates specific heritage-related transactions, including the digital sale of cultural products, highlighting the modern integration of e-commerce. This reflects CHARTER's approach to heritage as both a cultural and commercial resource, where digital tools can monetize engagement while expanding cultural access. ESPON HERITAGE refers to the demand side of the value chain by including activities related to the consumption of a site, such as tourism, and the users' expenditure.

**Preservation:** Across all references is seen **as essential for maintaining and protecting cultural assets**. However, the scope and approach to preservation vary among the sources. CHARTER presents the most holistic perspective, incorporating both tangible and intangible cultural heritage, with an emphasis on preventive conservation strategies. This approach is unique among the references, as it includes cultural traditions, practices, and knowledge that require safeguarding to ensure continuity for future generations. Conversely, ESSnet-Culture and EC CCS focus more on traditional preservation activities, centring on the physical aspects of conservation, restoration, and maintenance of cultural heritage sites and objects. While digitization is included as a preservation tool, particularly in ESSnet-Culture, its primary role is as a method to protect and retain cultural materials for future accessibility and conservation, suggesting that digital tools are increasingly essential for physical heritage preservation in the modern era.

## Table 2: Summary of main highlights mentioned by each framework by function

| FUNCTIONS | MAIN INSIGHTS | UNESCO FCS | ESSnet-Culture | EC CCS | FLANDERS SA | ESPON HERITAGE | CHARTER |
|---|---|---|---|---|---|---|---|
| CREATION | Creation as the process of originating and authoring ideas and elaborating artistic or cultural content. | √ | √ | √ | √ | √ | √ |
| | Expansion of the definition of creation to include the recognition and attribution of heritage value. | | | | √ | √ | √ |
| | Non-traditional creative processes, such as organizing and designing for heritage exhibitions and conducting historical research. | √ | √ | | √ | | √ |
| PRODUCTION | Production includes creating items like books or films that can be reproduced, and unique items like heritage sites or buildings. | √ | √ | √ | √ | √ | N/A |
| | Maintenance and conservation of heritage properties. | | | | √ | √ | N/A |
| | Focus on activities and professionals directly tied to heritage preservation. | | | | √ | √ | N/A |
| DISSEMINATION TRADE | Recognition of the role of digital platforms and digital trade | √ | √ | √ | √ | √ | N/A |
| | Marketing and communication strategies to promote heritage attractions. | | | | √ | √ | N/A |
| | Trade focusing on the direct sale of cultural goods and dissemination encompassing broader communication efforts. | √ | √ | √ | | | N/A |
| | Inclusion of real estate market and redevelopment projects | √ | | | √ | √ | N/A |
| EXHIBITION RECEPTION TRANSMISSION | Include informal knowledge and skill transfer, preserving intangible cultural heritage. | √ | N/A | √ | | | N/A |
| | Incorporation of both direct physical access and indirect digital access. | | N/A | | √ | √ | N/A |
| | Prioritization of cultural and educational impacts over revenue generation. | √ | N/A | √ | | | N/A |
| CONSUMPTION PARTICI- | Digital tools and interactive platforms to involve stakeholders in the heritage experience. | √ | N/A | N/A | N/A | | √ |
| | Participation as individual cultural consumption. | √ | N/A | N/A | N/A | | |
| | Integration of e-commerce. | | N/A | N/A | N/A | | √ |

| FUNCTIONS | MAIN INSIGHTS | UNESCO FCS | ESSnet-Culture | EC CCS | FLANDERS SA | ESPON HERITAGE | CHARTER |
|---|---|---|---|---|---|---|---|
| | Heritage as both a cultural and commercial resource, where digital tools can monetize engagement while expanding cultural access. | √ | N/A | N/A | N/A | | √ |
| | Activities related to tourism and users' expenditure on site | | N/A | N/A | N/A | √ | |
| PRESERVA-TION | Most holistic perspective, incorporating both tangible and intangible cultural heritage. | N/A | | | N/A | N/A | √ |
| | Focus on the physical aspects of conservation, restoration, and maintenance of cultural heritage sites and objects. | N/A | √ | √ | N/A | N/A | |
| | Inclusion of digitization of heritage | N/A | √ | √ | N/A | N/A | √ |

*N/A indicates that the framework does not explicitly address the specific function considered, while "√" indicates that the framework addresses the specific main insight of the function.*

# 4 Delimitation of the material cultural heritage sector in the HERMES Satellite Account

A methodology for the material cultural heritage satellite account, unlike the culture satellite account, should aim to consider the economic activities driven by heritage itself, as well as those arising from its use and mere existence, which are not solely cultural in nature. A key aspect of this methodology should be the delineation of a value chain specifically tailored to material cultural heritage (MCH). This value chain should be designed to integrate the functions and activities derived from it, following a more comprehensive and holistic approach and extending beyond the purely cultural perspective. The approach of HERMES SA focuses on assessing the value generated by the material cultural heritage sector, rather than its economic valuation, highlighting the importance of understanding the sector's contributions to the economy beyond its monetary worth.

Given the unique characteristics of the material cultural heritage sector, adapting the traditional value chain model is crucial to reflect its distinctive value creation process. Unlike conventional sectors where value arises from a straightforward linear sequence from creation to consumption, cultural heritage involves functions centred on preservation, community engagement, and significance. Heritage cannot be "produced" in the same way as a product or service; instead, it holds value as communities recognize and reinterpret it over time. Traditional economic functions such as "creation" and "consumption" fail to capture this dynamic process, where cultural heritage is seen as a shared resource that continually evolves.

Another aspect that must be addressed in defining the material cultural heritage sector is the impact of the digitization. As a process, digitization is a relatively recent phenomenon, yet it has had a rapid and intense effect on the sector. According to UNESCO/PERSIST and IFLA, digital heritage comprises computer-based materials that are either "born digital" or digitized from other formats (IFLA, 2024; UNESCO/PERSIST, 2016). This includes a wide variety of formats such as texts, images, audio, video, software, and web pages, all created through specific procedures and standards. Examples range from digital-born museum collections and digital surrogates of physical objects to metadata documenting collections. Ensuring the authenticity, accessibility, and usability of digital heritage over time requires active management, including preservation strategies and the maintenance of digital infrastructures.

This expanded understanding of cultural heritage, including digital forms, has been explicitly addressed in the ESPON HERIWELL project, which defined cultural heritage broadly, aligning with the concept of cultural capital as framed by international frameworks (HERIWELL project, 2022). This encompasses tangible, intangible, digital, and mixed forms of heritage. The inclusion of digital heritage highlights its potential to enhance both tangible and intangible cultural assets, such as recreating experiences tied to existing or lost heritage sites. However, the overlapping nature of heritage categories often complicates measurement and policymaking. To address these challenges, HERIWELL adopts a multimethod approach, examining cultural heritage broadly through case studies, surveys, and EU initiatives, while employing proxies to analyse specific heritage forms at a macro level.

Based on the review of previous frameworks, **HERMES redefines the sector by adapting the concept of the value chain to the specific functions and activities integral to material cultural heritage**. This adapted model emphasizes identifying, preserving, transmitting, and making accessible heritage, activities essential to safeguarding heritage's values also for future generations. Rather than relying on rigid representations, HERMES proposes a model that acknowledges the sector's integrated and non-hierarchical nature.

To avoid unnecessary debate over visual representations, the HERMES model focuses on clearly defining core activities for each function, rather than adhering to a traditional hierarchy. Management and governance, which have been included in some frameworks, are considered as systemic aspects operating across the entire value chain and are essential to the entire sector's performance. They have an integral role in enabling and coordinating all the functions, from recognition to trade, described in the value chain. By situating governance and management as cross-cutting components, the proposed approach focused on the description of the functions and allows the model to capture the material cultural heritage sector's complex structure and its role as a dynamic, non-hierarchical ecosystem.

HERMES also acknowledges that the activities within each function of the adapted value chain can vary depending on the type of cultural heritage being addressed, whether it be movable, immovable, or a cultural landscape. Each heritage type brings unique activities that shape how functions such as recognition, preservation, transmission, and trade are considered.

**Figure 1: Adaptation of the value chain model to the material cultural heritage sector**


Although HERMES does not aim to formulate a standard and internationally accepted classification of heritage types, it provides clear definitions tailored to the model's objectives. These definitions are crafted to support a coherent approach throughout the HERMES model but still allow for interpretations according to national regulations. This approach ensures that the model can be applied across diverse heritage contexts, making it both comprehensive and adaptable to specific needs and functions.

In line with this flexible and inclusive approach, HERMES recognizes the importance of digitalization as a key factor that cuts across different heritage categories, rather than treating it as a separate category. Digitalization often intersects with immovable and movable heritage, supporting preservation and fostering wider appreciation. It is integral to activities such as documentation, conservation, education, reconstruction, and accessibility. As such, digitalization should be viewed as a transformative process spanning all functions of cultural heritage, rather than a distinct type of heritage.

Therefore, the three categories considered by HERMES as part of the material cultural heritage sector are:

**Movable cultural heritage**: artifacts, objects, and collections, including fine arts, decorative arts, ethnographic collections, historic industrial machines and equipment, archaeological objects, archival materials, and manuscripts.

**Immovable cultural heritage**: Monuments, (group of) buildings, structures, sites of historical, architectural, artistic, anthropological, ethnographical, or cultural significance, such as temples, churches, castles, historic centres, vernacular architecture and archaeological sites.

**Cultural landscape**: areas that have been shaped historically by human activities and that are valued by their communities, representing the relationship between people and their natural environment. HERMES project considers two categories out of the three proposed by (UNESCO, 2008), as the ones related to material cultural heritage: (i) landscapes designed and created intentionally by man, such as gardens and parklands; (ii) organically evolved landscapes shaped by social and environmental factors, either as historical relicts or still-evolving.

By focusing on these definitions, HERMES ensures that activities within each function can be tailored to suit the distinct characteristics and requirements of different heritage types while maintaining a unified approach.

HERMES introduces a set of core functions that reflect the distinct activities representative of the material cultural heritage sector. The functions identified in this model are intentionally broad to accommodate the diversity across the three main typologies identified: movable, immovable, and cultural landscape, which have distinct needs, influencing the activities associated with each function in the value chain. By establishing these functions, the project aims to create a flexible yet coherent conceptual framework that recognizes the diversity of heritage practices.

**IDENTIFICATION AND RECOGNITION:** Refers to all the activities necessary to identify and recognize material cultural heritage values. These include **inventorying** aimed at locating, documenting and assessing heritage conditions; **documentation and research**, such as information gathering on the historical significance and cultural context, archaeological excavations, archival and literature research and records creation, including digital tools and formats, enabling the creation of databases and repositories; **classification**, as a means to catalogue cultural heritage in different typologies, describing its characteristics and assessing its significance and relevance; **nomination and designation**, intended as the process to officially recognize and protect cultural heritage by local, regional, national or international institutions. **Volunteering** activities can contribute to documentation and research by participating in the recording and cataloguing of artifacts, collections or archaeological sites, including also digital platforms and applications. **Higher education**, including academic programs or research opportunities, provides specific in-depth knowledge and know-how and contributes to supporting and promoting interdisciplinary approaches for a comprehensive understanding of material cultural heritage. Non-university education, such as informal education or specialized programs contributes to raising awareness of the importance of material cultural heritage and developing cultural literacy.

**PRESERVATION AND CONSERVATION:** Refers to a set of activities designed to ensure the long-term protection and accessibility of cultural heritage. These activities typically cover preventative measures, maintenance, and restoration as well as technical support and research needed for effective preservation. More specifically, activities included in this function, relate to **conservation studies and laboratory services**, intended as research and specialized analysis or diagnosis to determine the state of conservation and preservation needs and establish treatments, including digital techniques, tools and imaging; **conservation and restoration activities**, such as restoration works supervised or performed by specialized professionals and **regular maintenance** activities to ensure the preservation and functionality of cultural heritage, including gardening, security, cleaning, etc. These activities are also related to construction works related to the concept of circular economy and reuse, helping to mitigate consumption and preserving historic buildings. This category also includes **fundraising for conservation**, as efforts are performed to secure financial resources, such as grants, donations or institutional partnerships and the creation of **digital replicas** to support preservation by reducing physical handling and enabling collaborative workspace for professionals, as well as heritage reconstruction in case of loss (natural disasters, armed conflicts or climate change).

For artifacts and other movable cultural objects, specific conservation activities are related to **specialized furniture and material production**, e.g. paints and coatings, that support the longevity of artifacts, **environmental monitoring and specific lighting devices** to control and maintain optimal conditions, often customized for movable heritage needs, as fluctuations and changes in temperature, humidity and light. Furthermore, efforts by museums to acquire objects through purchase, donation, or other means with the primary objective of protecting, designating and ensuring long-term preservation, also fall into this category.

Cultural landscapes often involve large-scale **environmental management**, such as maintenance of natural characteristics, risk mitigation and accessibility. Specialized gardening and landscape services are used to ensure the integrity of gardens, natural areas and associated cultural elements.

**Volunteering** activities in this category can be associated with tasks related to ordinary maintenance, cleaning, inspections and protection of cultural heritage as well as disaster and recovery actions, often under the guidance of professionals. Volunteering is also an essential component in supporting fundraising and advocacy efforts, raising awareness and resources for heritage conservation and fostering partnerships among institutions and community groups. **Training** activities support capacity building and skills development for volunteers and professionals, especially concerning conservation and restoration techniques, heritage management and maintenance, traditional and artisanal craftsmanship and the creation and use of digital models for conservation. It is often linked to apprenticeship, trade and employment schools/workshops included in employment programs. **Insurance** concerning this category covers physical aspects of cultural heritage, such as the protection against damage, loss or theft of artifacts or assets. **Higher education** supports this category by teaching conservation and restoration techniques, including promoting sustainable practices by addressing energy efficiency and climate-related issues, the use of AI and data analysis in support of conservation activities, etc. The variety of subjects related to the conservation of material cultural heritage spans from history, anthropology, geography, sociology, art history, architecture, archaeology, etc.

**TRANSMISSION/ENGAGEMENT:** Refers to activities that can be used to both transmit information and engage the audience. These include **exhibition and dissemination** of cultural heritage by sharing information and knowledge with the public through various means, such as distributing materials, guided visits, etc., fostering a sense of community and participation to engage with the content on a deeper level, also through digital

materials; **use of ICTs** (digital content, 3D, virtual visits, websites) to engage with the wider audience, democratizing access, transmit complex information engagingly and interactively or provide knowledge on inaccessible cultural heritage; **communication** activities through social media and online platforms, applications to share information, updates, news and educational content rapidly and efficiently. **Volunteering** activities related to transmission and engagement are related to guided tours, development and dissemination of educational material and activities, interactive exhibits and workshops, etc. Volunteers often play a crucial role by participating in activities and often focus on creating and enhancing digital content related to cultural heritage, contributing to platforms like Wikipedia and participating in initiatives, supporting transmission and dissemination of cultural heritage. **Training programs** can also be used to transmit knowledge and provide new skills on exhibition content, engagement and participation techniques or digital technologies to staff, volunteers, and even the audience. **Insurance** concerning this category is associated with liability insurance for staff and volunteers and insurance coverage for digital technologies and equipment used in transmission and engagement activities. **Education** in this category can leverage digital technologies, such as virtual reality, 3D modelling, engagement platforms and techniques, interactive, immersive and accessible to all technologies and in developing education programs based on these.

Specifically referring to movable cultural heritage, when artifacts are loaned or transported for temporary exhibitions, they require special **packaging and transportation** to ensure their safety. This requires the involvement of specialized companies working in the packaging and transport sector, as a significant procedure in the exhibition's logistics.

**USE/TRADE:** Activities related to this function are related to understanding how heritage is used and traded in various sectors. Cultural heritage is considered a central attraction within the **tourism industry and leisure** activities. Heritage-led tourism and leisure generates revenue through entrance fees, guided tours, transportation and accommodation, as well as supplementary services such as food and merchandising. Heritage is often used in **advertising** to create a sense of authenticity, or prestige. Brands may use historical imagery or cultural icons to promote their products or services. By associating products or brands with cultural heritage imagery, advertisements contribute to the symbolic trade of heritage, using it to enhance brand value. Digital representations of cultural heritage enable new forms of interaction, research, and commercial opportunities, often supported and enriched by **volunteers**. Furthermore, heritage is increasingly being used in the **audiovisual and gaming** industries to create immersive experiences. Films or series, documentaries, and video games often rely on accurate representations of cultural heritage to attract global audiences, creating economic returns through ticket sales, subscriptions, game purchases, and merchandise. Additionally, **insurance** plays a crucial role in this category as it provides financial security in various activities, such as risk mitigation against damages, unforeseen damages to heritage or accidents during events hosted in heritage sites. It also related to the residential use of historic buildings.

As for the immovable cultural heritage, part of it takes the form of dwellings, whose use generates an economic value in the form of rents for their owners, when they are rented, and imputed rents when the owners themselves reside in them. This value is subject to accounting in HERMES SA. On the other hand, the dwellings and buildings that are considered part of the material heritage also give rise to an economic activity that consists of intermediation in the **real estate** market. In the delimitation of the sector proposed by HERMES SA, however, the increase in the value of the properties that constitute the material cultural heritage is not included. Nevertheless, the approach adopted does not ignore that the activities of preservation and restoration of immovable heritage increase its value, making it more attractive to investors and buyers.

For movable cultural heritage, **antiques sale** is also related to this function as it may involve the exchange of artifacts with historical, artistic, and cultural significance.

For cultural landscapes, **agricultural products** associated with heritage, such as traditional foods and beverages, are often linked to specific geographical and cultural origins. Protected Designation of Origin (PDO) certifications add value to these products by ensuring that they are tied to their region of origin and traditional production methods. PDO products become part of the heritage trade, creating demand in domestic and international markets for culturally significant goods. Similarly, the **fishing and aquaculture** sectors are related to the value of cultural landscapes through traditional practices, artisanal fishing methods, and regionally distinct products. These products often benefit from PDO or similar certifications, further embedding them within the heritage economy.

The following table summarises the conceptual framework by linking material cultural heritage activities with the proposed functions:

## Table 3: HERMES model- functions and related activities

<table>
<tr><th>IDENTIFICATION AND RECOGNITION (I)</th><th>PRESERVATION AND CONSERVATION (P)</th><th>TRANSMISSION AND ENGAGEMENT (E)</th><th>USE AND TRADE (T)</th></tr>
<tr><td colspan="4">1) Management and governance</td></tr>
<tr><td>2) Documentation and research (historical and archival research, archaeological excavations, etc.), including digital documentation</td><td>6) Conservation studies and laboratory services</td><td>19) Exhibition and dissemination (dissemination materials, guided visits, …)</td><td>22) Tourism and leisure (transport, accommodation…)</td></tr>
<tr><td>3) Inventory</td><td>7) Conservation and restoration activities</td><td>20) ICTs (digital content - incl. 3D, virtual visits, websites…-)</td><td>23) Advertisement</td></tr>
<tr><td>4) Legal protection (nomination and designation)</td><td>8) Maintenance (including security, cleaning...)</td><td>21) Communication (social media...)</td><td>24) Audiovisual and gaming</td></tr>
<tr><td colspan="4">5) Volunteering</td></tr>
<tr><td rowspan="10"></td><td colspan="2">9) Training</td><td></td></tr>
<tr><td>10) Fundraising for conservation interventions</td><td>25) Packaging & Transport (temporal exhibitions)*</td><td>26) Antiques sale*</td></tr>
<tr><td>11) Digital replica and tools for analysis, study and preservation</td><td rowspan="7"></td><td>27) Real estate**</td></tr>
<tr><td>12) Acquisition (museums collections)*</td><td>28) Agriculture & farming***</td></tr>
<tr><td>13) Manufacturing of specialized furniture and materials for movable heritage preservation *</td><td>29) Fishing and aquaculture***</td></tr>
<tr><td>14) Sensors / devices for environmental conditions monitoring and control (HVAC)*</td><td rowspan="6"></td></tr>
<tr><td>15) Lighting (specific for preservation)*</td></tr>
<tr><td>16) Environmental management (landscaping)***</td></tr>
<tr><td colspan="2">17) Higher education</td></tr>
<tr><td></td><td colspan="2">18.1) Insurance</td><td>18.2) Insurance</td></tr>
</table>

**= activities specific to movable heritage; **=activities specific to immovable heritage; ***= activities specific to cultural landscapes*

The conceptual framework aims to comprehensively describe material cultural heritage activities by their functions. However, some activities must be understood within a broader context, especially when empirical references such as the NACE classification are applied. The NACE (Rev. 2.1) classification often does not align with the specific activities of MCH, leading to several challenges.

For instance, in the case of **museums**, a single NACE code (91.02 Museum and collection activities) encompasses numerous activities related to movable heritage, covering activities of different functions under one code. This is also appreciable in **management and governance** activities which, as outlined previously, operate across the entire value chain of MCH. Certain activities, such as **inventory** and **legal protection**, are essential public-sector responsibilities directly linked to heritage preservation. General heritage administrations at different levels are primarily responsible for carrying out specific activities such as inventory creation and implementing legal protection measures. Such activities are generally classified under **General public administration activities** in the NACE framework.

This challenge is not unique to museums or governance; in many cases, the NACE classification refers to broader categories of activities in which MCH represents only a portion of the described activities. This necessitates the use of estimation strategies based on data retrieval to isolate the MCH-related components within these broader categories.

In addition, sectors like **advertising**, **audiovisual production**, and **gaming** leverage cultural heritage for the development of their products, drawing upon its imagery, narratives, and values. These industries benefit from the cultural character and identity that heritage assets provide. However, isolating and quantifying the specific contributions of the heritage sector within these industries remains challenging.

Furthermore, activities associated with maintenance, acquisition, the manufacturing of specialized furniture and material, monitoring and lighting devices, packaging and transport, ICTs and communication are typically considered as **intermediate consumption**. These activities are primarily accounted under categories like museums, historical sites or other organizations involved in cultural heritage management.

The following table summarizes the HERMES activities and their alignment with the NACE classification (Rev. 2.1), considering their connection to material cultural heritage and categorizing them as fully, partially, or marginally related. Activities highlighted in green are considered as fully related to MCH, thus they don't need any estimation strategy. Activities highlighted in grey are disregard, due to the inherent difficulty in estimating their contribution, though they could be interesting topics for further research. For the other activities included in Table 4 it will be necessary to apply estimation strategies to determine the internal composition of the corresponding NACE classes. Chapter 6 of this document suggests sources of information and procedures that can be used in these estimates. However, these procedures should be subject to ongoing scrutiny and improvement, and consequently, should be considered strictly provisional and adapted to the particular circumstances of each country and region.

**Table 4: HERMES SA activities and their relation with NACE standard classification**

| Type of MCH | Functions | Activities | Economic activities (NACE Rev. 2.1) | Relation with MCH |
|---|---|---|---|---|
| All | All | 1, 3, 4 | 84.11 General public administration activities | Partially |
| Movable | I, P & E | 2, 3, 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 18.1, 19, 20, 21 | 91.11 Library activities | Partially |
| Movable | I, P & E | 2, 3, 6, 7, 8, 9, 11, 12, 13, 14, 15, 18.1,19, 20, 21 | 91.12 Archive activities | Fully |
| Movable | All | 2, 3, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 18.1, 19, 20, 21, 25 | 91.21 Museum and collection activities | Fully |
| Immovable & landscape | I, P & E | 2, 3, 5, 6, 7, 8, 9, 10, 11, 13, 14, 15, 18.1, 19 | 91.22 Historical site and monument activities | Fully |
| Movable & Immovable | P | 6, 7, 11 | 91.30 Conservation, restoration and other support activities for cultural heritage | Fully |

| Type of MCH | Functions | Activities | Economic activities (NACE Rev. 2.1) | Relation with MCH |
|---|---|---|---|---|
| Landscape | P & E | 8, 16, 19 | 91.41 Botanical and zoological garden activities | Partially |
| Landscape | T | 28 | 01.1 Growing of non-perennial crops | Partially |
| | | | 01.2 Growing of perennial crops | Partially |
| | | | 01.4 Animal production | Partially |
| | | | 01.50 Mixed farming | Partially |
| | | | 01.6 Support activities to agriculture and post-harvest crop activities | Partially |
| Landscape | T | 29 | 03 Fishing and aquaculture | Partially |
| Landscape | P | 16 | 81.3 Landscape service activities | Partially |
| Immovable | P | 7 | 43.99 Other specialised construction activities n.e.c. | Partially |
| | | | 71.11 Architectural activities | Partially |
| All | P | 7 | 71.12 Engineering activities and related technical consultancy | Partially |
| Movable & Immovable | P | 6 | 71.2 Technical testing and analysis | Partially |
| Immovable | T | 27 | 68.20 Rental and operating of own or leased real estate | Partially |
| | | | 68.31 Intermediation service activities for real estate activities | Partially |
| | | | 68.32 Other real estate activities on a fee or contract basis | Partially |
| All | I, P & E | 17 | 85.3 Secondary and post-secondary non-tertiary education | Partially |
| | | | 85.4 Tertiary education | Partially |
| | | | 85.5 Other education | Partially |
| All | I & P | 2, 6, 7, 11, 16 | 72.10 Research and experimental development on natural sciences and engineering | Partially |
| All | I, P & E | 2, 6, 7, 11, 19 | 72.20 Research and experimental development on social sciences and humanities | Partially |
| All | T | 22 | 49.1 Passenger rail transport | Partially |
| | | | 49.3 Other passenger land transport | Partially |

| Type of MCH | Functions | Activities | Economic activities (NACE Rev. 2.1) | Relation with MCH |
|---|---|---|---|---|
| | | | 50.1 Sea and coastal passenger water transport | Partially |
| | | | 50.3 Inland passenger water transport | Partially |
| | | | 51.1 Passenger air transport | Partially |
| | | | 55 Accommodation | Partially |
| | | | 56 Food and beverage service activities | Partially |
| | | | 79 Travel agency, tour operator and other reservation service and related activities | Partially |
| | | | 77.11 Rental and leasing of cars and light motor vehicles | Partially |
| | | | 90-92 Excluding those considered as MCH activities | Partially |
| Immovable | T | 18.2 | 65.12 Non-life insurance | Partially |
| Movable | T | 26 | 47.79 Retail sale of second-hand goods | Partially |
| Movable | T | 26 | 47.9 Intermediation service activities for retail sale | Partially |
| All | T | 23 | 73.11 Activities of advertising agencies | Marginally |
| All | T | 24 | 73.12 Media representation | Marginally |
| | | | 59.1 Motion picture, video and television programme activities | Marginally |
| | | | 74.12 Graphic design and visual communication activities | Marginally |
| All | All | 5 | 98.2 Undifferentiated service-producing activities of private households for own use | Partially |
| All | All | 5, 10 | 94.99 Activities of other membership organisations n.e.c. | Partially |

*Activities partially related to MCH whose contribution cannot be estimated.*

*Activities fully related to MCH that require no estimation.*

*Functions: I= Identification, P= Preservation, E= Engagement, T= Trade. Activities: 1) Management and governance; 2) Documentation and research; 3) Inventory; 4) Legal protection; 5) Volunteering; 6) Conservation studies and laboratory services; 7) Conservation and restoration activities; 8) Maintenance; 9) Training; 10) Fundraising; 11) Digital replica and tools; 12) Acquisition; 13) Manufacturing of specialized furniture; 14) Sensors / devices; 15) Lighting; 16) Environmental management; 17) Education; 18) Insurance; 19) Exhibition and dissemination; 20) ICTs; 21) Communication; 22) Tourism; 23) Advertisement; 24) Audiovisual; 25) Packaging & Transport; 26) Antiques sales; 27) Real estate; 28) Agriculture and farming; 29) Fishing and aquaculture.*

# 5 Proposal for a Material Cultural Heritage Satellite Account (HERMES SA)

## 5.1 Satellite Accounts in ESA-2010 and HERMES SA

The European System of Accounts ESA-2010 (EUROSTAT & EC, 2013) includes a chapter on satellite accounts, defining them as modules that can be added to the central framework, which involve modifying some of the tables and accounts that are part of the central framework—or adding new tables and accounts—*"to serve specific data needs"* (EUROSTAT & EC, 2013, p. 467). Satellite Accounts allow for the statistical description of specific economic sectors in greater detail than is possible in the central framework. To this end, Satellite Accounts *"provide supplementary information, such as non-monetary flows and stocks"*, use specific categories, and sometimes *"deviate from the central concepts"* (EUROSTAT & EC, 2013, p. 467).

According to ESA-2010 manual (EUROSTAT & EC, 2013, p. 467), Satellite Accounts can share some of the following characteristics:

- links to functions, as in functional satellite accounts;
- links to industries or products, which is one type of special sector accounts;
- links to institutional sectors, a second type of special sector accounts;
- extension with physical or other non-monetary data;
- extra detail;
- use of supplementary concepts;
- modification of some basic concepts;
- use of modelling or inclusion of experimental results.

**HERMES SA is defined as a satellite account that quantifies and describes the economic activities directly linked to the material cultural heritage (MCH)**. For this purpose, it is associated with certain industries and products; uses some classifications complementary to those of the central framework and specific to the sector; can provide physical (non-monetary) information; and, finally, proposes some criteria and concepts that differ from those of the central framework, resulting in an expansion of the production boundary relative to the said framework.

In its general exposition on Satellite Accounts, ESA-2010 specifically refers to the *Cultural and Creative Sector Accounts* (EUROSTAT & EC, 2013, p. 469), which it catalogues as a *"well-established"* Satellite Account and *"subject to international guidelines"*. HERMES SA, on the other hand, does not have an equivalent background, which should promote attitudes of mutual institutional learning, continuous improvement, and transparency regarding the criteria, concepts, and estimation methods each country employs when undertaking the preparation of this Account.

On the other hand, ESA-2010 distinguishes between *Functional satellite accounts* and *Special sector accounts*. The former *"focus on describing and analysing the economy for a function, such as environment [or] health"* and one of their main objectives is to determine the *"national expenditure on the function"* (EUROSTAT & EC, 2013, p. 472). Meanwhile, the second *"provide an overview focused on one industry or product, a regrouping of various industries or products, one subsector or a regrouping of various subsector"* (EUROSTAT & EC, 2013, p. 476).

HERMES SA adopts the *Special sector accounts* approach with the aim of measuring economic activity in a series of "key industries" and "key products" identified by their relationship with the presence of MCH in an economy. The most significant outputs of the HERMES SA are the *production account* and the *generation of income account* for the key industries.

## 5.2 HERMES SA's approach and objectives

HERMES SA is designed with the following objectives:

- To estimate the **macroeconomic aggregates that describe the size of the MCH sector** and its internal composition, according to the sector's own categories.

- To prepare **detailed production tables for the MCH associated industries** that include information on Gross Value Added (GVA) and Intermediate Consumption (IC).
- To provide **information on employment** in the sector.
- To **serve as a framework for the collection of other information**, not necessarily economic in nature, according to the sector's own categories and classifications.

HERMES SA adopts a supply-side approach, focusing on value creation in certain industries rather than on the expenditure of different institutional units on the products and services that define the sector or on how such expenditure is financed.

Furthermore, the primary aim of HERMES SA is descriptive in nature, indicating that it does not anticipate estimating the indirect or induced effects that sector activities may have on other industries and, ultimately, on the overall economic system. However, it provides detailed estimates of the economic activity associated with MCH by industries and constitutes a first step towards more comprehensive estimates that measure the effect of these activities on other industries, through usual input-output analysis procedures (Miernyk, 2020).

These two characteristics distinguish HERMES SA from other similar operations in the field of satellite accounting. For example, some Satellite Accounts provide a comprehensive description of a sector of particular public interest that fulfils an important function of final expenditure by Public Administrations or Households. This is exemplified by the *Health Satellite Account*. In their System of Health Accounts (SHA), OECD, EUROSTAT & WHO describe the health sector by identifying and quantifying all economic flows that enable the financing of final employment in health services (OECD et al., 2017). Consequently, SHA proposes a sequence of accounts in which distributive transactions predominate—such as *net social contributions [D.61], social benefits other than social transfers in kind [D.62], social transfers in kind [D.63], net non-life insurance premiums [D.71], or non-life insurance claims [D.72]* (EUROSTAT & EC, 2013)—as well as the value of final consumption expenditure on health services by different units and institutional groupings.

Adopting a markedly different approach, **HERMES SA focuses on identifying the value generated by a series of industries directly associated with the identification and recognition of MCH; the preservation and conservation of that heritage; its transmission; and the use and trade that encompass it**.

In this regard, HERMES SA aligns with the approach of *Special sector accounts* (EUROSTAT & EC, 2013, p. 476) and is similar to the Tourism Satellite Account (TSA) (UN et al., 2010) or some Culture Satellite Accounts (e.g., the one developed by the Ministry of Culture in Spain (MINISTERIO DE CULTURA Y DEPORTE, 2024). In their approaches, the starting point of the analysis is usually the supply table in the input-output framework (IOF), which is then narrowed to reflect the activity of specific industries associated with the tourism and cultural sectors, respectively. In the input-output framework, a supply table represents the value of the various goods and services produced by each of the industries that make up an economy, as well as the contribution of imported products and services (EUROSTAT & EC, 2013, p. 275). Overall, HERMES SA proposes the construction of a supply table restricted to the production of specific 'key industries' previously identified for their direct relationship with the MCH of each country and focuses exclusively on the production of resident units, thereby excluding imports of goods and services from analysis.

## 5.3 Key industries and products in the MCH sector

The first step in the development of HERMES SA involves the identification of the "key industries" that constitute the sector. In HERMES SA, this task is facilitated by a prior reflection, which leads to the identification and classification of economic activities associated with the presence of MCH (Chapter 4).

According to ESA-2010, an industry is defined as a group of *"local kind-of-activity units (KAUs) engaged in the same, or similar, kind-of-activity"* (EUROSTAT & EC, 2013, p. 50). At the highest level of detail, an industry includes all KAUs that can be classified under the same class of NACE. However, it is common to work with less detailed classification levels, as in the supply table of the IOF, where each industry includes KAUs belonging to different classes, groups, or divisions within the NACE classification structure.

It is therefore necessary to identify, the activities considered part of the MCH sector in terms of NACE classes and IOF branches. Table 5 summarizes the relationships between the specific categories of the MCH sector, as defined in this report, and the industries identified in the IO framework, along with the corresponding NACE categories (classes, groups, or divisions).

It is worth mentioning the main reference used concerning NACE classification. HERMES has considered NACE Rev. 2.1 since this new version of NACE incorporates classes that facilitate the identification of significant activities in the MCH sector. Although the sources and data consulted in developing this methodology followed the previous version, NACE Rev. 2, from 2025 onwards, European economic statistics will be based on NACE Rev. 2.1, a circumstance that will affect all applications of the HERMES SA methodology.

## Table 5: Classification of activities used in HERMES SA and their relationship with standard classifications

| Key industries | Type of MCH | Functions | Economic activities (NACE Rev. 2.1) | Activity weight | Input- Output branch | NACE activ. Included per IO branch |
|---|---|---|---|---|---|---|
| MCH libraries | Movable | I, P & E | 91.11 Library activities | Partial | Creative, arts and entertainment activities; libraries, archives, museums and other cultural activities; gambling and betting activities | S90-92 |
| Archives | Movable | I, P & E | 91.12 Archive activities | Complete | | |
| Museums | Movable | All | 91.21 Museum and collection activities | Complete | | |
| Historical and archaeological sites and monuments | Immovable & landscape | I, P & E | 91.22 Historical site and monument activities | Complete | | |
| Conservation, restoration and other support activities | Movable & Immovable | P | 91.30 Conservation, restoration and other support activities for cultural heritage | Complete | | |
| Agricultural landscape | Landscape | T | 01.1 Growing of non-perennial crops | Partial | Crop and animal production, hunting and related service activities | A01 |
| | | | 01.2 Growing of perennial crops | Partial | | |
| | | | 01.4 Animal production | Partial | | |
| | | | 01.50 Mixed farming | Partial | | |
| | | | 01.6 Support activities to agriculture and post-harvest crop activities | Partial | | |
| Waterscape | Landscape | T | 03 Fishing and aquaculture | Partial | Fishing and aquaculture | A03 |
| Insurance of historic dwellings | Immovable | T | 65.12 Non-life insurance | Partial | Insurance, reinsurance and pension funding, except compulsory social security | L65 |
| Rehabilitation of historic buildings (including dwellings) | Immovable | P | 43.99 Other specialised construction activities n.e.c. | Partial | Construction | F |

| Key industries | Type of MCH | Functions | Economic activities (NACE Rev. 2.1) | Activity weight | Input- Output branch | NACE activ. Included per IO branch |
|---|---|---|---|---|---|---|
| | Immovable | P | 71.11 Architectural activities | Partial | Architectural and engineering activities; technical testing and analysis | N71 |
| Real estate of historic dwellings | Immovable | T | - | Partial | Imputed rents of owner-occupied dwellings | M68.20 |
| | | | 68.20 Rental and operating of own or leased real estate | Partial | Real estate activities excluding imputed rents | M |
| | | | 68.31 Intermediation service activities for real estate activities | Partial | | |
| | | | 68.32 Other real estate activities on a fee or contract basis | Partial | | |
| Antiques sale | Movable | T | 47.79 Retail sale of second-hand goods | Partial | Retail trade, except of motor vehicles and motorcycles | G47 |
| | Movable | T | 47.9 Intermediation service activities for retail sale | Partial | | |
| Development and dissemination of MCH material and participatory activities through the work of volunteers | All | All | 98.2 Undifferentiated service-producing activities of private households for own use | Partial | Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use | U |
| | All | All | 94.99 Activities of other membership organisations n.e.c. | Partial | Activities of membership organisations | T94 |
| MCH Tourism | All | T | 49.1 Passenger rail transport | Partial | Land transport and transport via pipelines | H49 |
| | | | 49.3 Other passenger land transport | Partial | | |
| | | | 50.1 Sea and coastal passenger water transport | Partial | Water transport | H50 |

| Key industries | Type of MCH | Functions | Economic activities (NACE Rev. 2.1) | Activity weight | Input- Output branch | NACE activ. Included per IO branch |
|---|---|---|---|---|---|---|
| | | | 50.3 Inland passenger water transport | Partial | | |
| | | | 51.1 Passenger air transport | Partial | Air transport | H51 |
| | | | 55 Accommodation | Partial | Accommodation and food service activities | I |
| | | | 56 Food and beverage service activities | Partial | | |
| | | | 79 Travel agency, tour operator and other reservation service and related activities | Partial | Travel agency, tour operator reservation service and related activities | O79 |
| | | | 77.11 Rental and leasing of cars and light motor vehicles | Partial | Rental and leasing activities | O77 |
| | | | 90-92 Excluding those considered as MCH activities | Partial | Creative, arts and entertainment activities; libraries, archives, museums and other cultural activities; gambling and betting activities (except for cultural activities associated to MCH) | S90-92 |
| MCH associated education | All | I, P & E | 85.3 Secondary and post-secondary non-tertiary education | Partial | Education | Q85 |
| | | | 85.4 Tertiary education | Partial | | |
| | | | 85.5 Other education | Partial | | |
| MCH associated research (including archaeological excavations) | All | I & P | 72.10 Research and experimental development on natural sciences and engineering | Partial | Scientific research and development | N72 |
| | All | I, P & E | 72.20 Research and experimental development on social sciences and humanities | Partial | | |

| Key industries | Type of MCH | Functions | Economic activities (NACE Rev. 2.1) | Activity weight | Input- Output branch | NACE activ. Included per IO branch |
|---|---|---|---|---|---|---|
| Non-market general administration services by Public Administration | All | All | 84.11 General public administration activities | Partial | Public administration and defence; compulsory social security | P84 |

## Table 6: Classification of products used in HERMES SA and their relationship with standard classifications

| HERMES SA 'key products' | Input- Output Framework Product |
|---|---|
| MCH libraries activities | Creative, arts, entertainment, library, archive, museum, other cultural services; gambling and betting services |
| Archives activities | |
| Museums activities | |
| Historical and archaeological sites and monuments activities | |
| Conservation, restoration and other support activities | |
| Agricultural landscape activities | Products of agriculture, hunting and related services |
| Waterscape activities | Fish and other fishing products; aquaculture products; support services to fishing |
| Insurance services of Historic dwellings | Insurance, reinsurance and pension funding, except compulsory social security |
| Rehabilitation of Historic buildings (including dwellings) services | Constructions and construction works |
| | Architectural and engineering activities; technical testing and analysis |
| Real estate of historic dwellings services | Imputed rents of owner-occupied dwellings |
| | Real estate services excluding imputed rents |
| Antiques sale services | Retail trade services, except of motor vehicles and motorcycles |
| Development and dissemination of MCH material and participatory activities through the work of volunteers | Services of households as employers; undifferentiated goods and services produced by households for own use |
| | Services furnished by membership organisations |
| MCH Tourism services | Land transport services and transport services via pipelines |
| | Water transport services |
| | Air transport services |
| | Accommodation and food services |
| | Travel agency, tour operator and other reservation services and related services |
| | Rental and leasing services |
| | Creative, arts, entertainment, library, archive, museum, other cultural services; gambling and betting services (except for cultural activities associated to MCH) |
| MCH associated education activities | Education services |
| MCH associated research activities (including archaeological excavations) | Scientific research and development services |
| Non-market general administration services by Public Administration activities | Public administration and defence services; compulsory social security services |

In contrast to other Satellite Accounts, the selection of key industries in HERMES SA is based on a distinct criterion. Unlike Culture Satellite Accounts, which typically identify cultural industries by their creative content, intellectual property rights generation potential, or association with traditional notions of culture and artistic expression, the HERMES SA selected industries are chosen because all or part of their activity is due to and explained by the existence or proximity of material cultural heritage (MCH) objects. A prime example of this approach is the tourism industry. While tourism activities generally do not have a creative, artistic, or cultural component, they take place, at least partially, because visitors who demand tourism services are attracted by the possibility of enjoying and appreciating MCH in a specific geographical context.

In other cases, the MCH constitutes the condition under which an identifiable economic value is created. This occurs in the case of imputed rents for the use of historic buildings by their owners. Conventionally, historic buildings are considered those constructed before a certain date, and many of these buildings function as residences for their owners (ESPON HERITAGE, 2019). Similar to ESPON HERITAGE, HERMES SA employs a methodology that uses a coefficient to isolate immovable material cultural heritage in relation to some sectors. HERMES suggests expanding the pre-1919 cutoff and selecting the year 1945 as the threshold for the identification of historic buildings. This proxy is used to calculate the historic building stock, representing a data category that is consistently available at the NUTS 3 regional level across Europe, facilitating comparative analysis. The pre-1946 cutoff considers almost all heritage-related buildings with architectural, cultural, or historical significance, including those from the constructive period related to World War II.

Other key industries carry out essential activities for the preservation and conservation of the MCH, which explains the inclusion of non-life insurance services in the sector, as well as construction activities and professional services related to the rehabilitation of historic buildings. At the sector's boundaries, key industries also include general administration activities that can be linked to the management and preservation of certain MCH assets, and educational activities, which are considered necessary for training qualified personnel in the maintenance, preservation, and management of MCH.

The delimitation of some key industries serves a practical purpose. In the case of tourism, where estimating the economic value of tourism services related to MCH is facilitated by the existence of a prior estimate of the value of tourism services in general. Such estimates already exist for at least 27 European countries (23 EU members, 3 EFTA countries, and one candidate) (EUROSTAT, 2023, p. 5), according to the methodological framework recommended for the Tourism Satellite Account (TSA) (UN et al., 2010). Consequently, the delineation of the tourism sector in HERMES SA is defined in close alignment with the TSA framework.

## 5.4 Structure of tables and cultural heritage elements

HERMES SA provides two modules for presenting information related to the MCH sector. The first module, or main module, provides economic information, including the value of production, GVA (Gross Value Added), and other aggregates typical of national accounting. This module also includes information on employment associated with the sector's activities.

The second module is complementary, with its development and scope determined by the entities responsible for MCH. Its purpose is to provide information on the stock of certain cultural heritage elements or institutions in a specific country or region, such as the number of historical buildings, or institutions managing MCH-related activities (e.g. number of museums or libraries that hold heritage objects).

### 5.4.1 Main module: Structure of tables

According to the second objective of the HERMES SA, the construction of a supply table restricted to MCH key industries, Table 7 has been elaborated including the following information:

- **Output**- the total value of products and services created during the accounting period by the KAUs in the MCH key industries at basic prices.
- **Intermediate consumption**- the value of goods and services consumed as inputs in the production process of the key industries. They are valued at purchase prices.
- **GVA-** the difference between output and intermediate consumption recorded at basic prices, meaning it does not account for the effect of trade and transport margins, nor taxes or subsidies on products in market prices. The sum of the value added by MCH key industries is the GVA-MCH, which measures the direct effect of MCH on economic activity.

- **Compensation of employees**- This measures the total remuneration, in cash or kind, payable by KAUs in the key industries to employees in return for work done during an accounting period.

Following the third objective, HERMES SA also provides information on employment in MCH key industries, as presented in Table 8.

It is worth noting that the information in Table 7 and Table 8 can be represented in different forms. For instance, Table 7 could adopt the form of *production accounts* and *generation of income accounts*, which would yield the corresponding balances, *Operating surplus* and *Mixed Income*. These accounts can be obtained separately for each of the key industries.

Those responsible for preparing the account in each country or region should determine the most suitable presentation of information in these tables, taking into account the different realities of data availability and the specific interests of stakeholders.

To facilitate understanding and transparency, it is recommended to include metadata alongside the tables, providing clear explanations of the scope and methods used in the estimations.

## Table 7: Production of HERMES industries and other industries (at basic prices)

| Key industry | MCH libraries | Archives | Museums | Historical sites and monuments | Conservation, restoration and other support activities | Agricultural landscape | Waterscape | Insurance of historic dwellings | Rehabilitation of historic buildings (including dwellings) | Real estate of Historic dwellings | Antiques sale | Development and dissemination of MCH material and participatory activities through the work of volunteers | MCH Tourism | MCH associated education | MCH associated research | Non-market general administration services by Public Admin- | Other industries | Output of domestic producers |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Type** | M | M | M | I&L | M&I | L | L | I | I | I | M | All | All | All | All | All | | |
| **Function** | I, P & E | I, P & E | All | I, P & E | P | T | T | T | P | T | T | All | T | I, P & E | I & P | All | | |
| **HERMES products** | | | | | | | | | | | | | | | | | | |
| MCH libraries activities | | | | | | | | | | | | | | | | | | |
| Archives activities | | | | | | | | | | | | | | | | | | |
| Museums activities | | | | | | | | | | | | | | | | | | |
| Historical and archaeological sites and monuments activities | | | | | | | | | | | | | | | | | | |
| Conservation, restoration and other support activities | | | | | | | | | | | | | | | | | | |
| Agricultural landscape activities | | | | | | | | | | | | | | | | | | |
| Waterscape activities | | | | | | | | | | | | | | | | | | |
| Insurance services of Historic dwellings | | | | | | | | | | | | | | | | | | |
| Rehabilitation of Historic buildings (including dwellings) services | | | | | | | | | | | | | | | | | | |
| Real estate of historic dwellings services | | | | | | | | | | | | | | | | | | |
| Antiques sale services | | | | | | | | | | | | | | | | | | |

| Key industry | MCH libraries | Archives | Museums | Historical sites and monuments | Conservation, restoration and other support activities | Agricultural landscape | Waterscape | Insurance of historic dwellings | Rehabilitation of historic buildings (including dwellings) | Real estate of Historic dwellings | Antiques sale | Development and dissemination of MCH material and participatory activities through the work of volunteers | MCH Tourism | MCH associated education | MCH associated research | Non-market general administration services by Public Admin- | Other industries | Output of domestic producers |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Development and dissemination of MCH material and participatory activities through the work of volunteers | | | | | | | | | | | | | | | | | | |
| MCH Tourism services | | | | | | | | | | | | | | | | | | |
| MCH associated education activities | | | | | | | | | | | | | | | | | | |
| MCH associated research activities (including archaeological excavations) | | | | | | | | | | | | | | | | | | |
| Non-market general administration services by Public Administration activities | | | | | | | | | | | | | | | | | | |
| Other non-key products | | | | | | | | | | | | | | | | | | |
| **1. Total output (at basic prices)** | | | | | | | | | | | | | | | | | | |
| **2. Total intermediate consumption (at purchasers' price)** | | | | | | | | | | | | | | | | | | |
| **(1-2) Total gross value added (at basic prices)** | | | | | | | | | | | | | | | | | | |
| **Compensation of employees** | | | | | | | | | | | | | | | | | | |
| **Other taxes less subsidies on production** | | | | | | | | | | | | | | | | | | |
| **Gross mixed income** | | | | | | | | | | | | | | | | | | |
| **Gross operating surplus** | | | | | | | | | | | | | | | | | | |

## Table 8: Employment in HERMES industries

| Employment in HERMES key industries | Type | Function | Number of jobs | | | Number of full-time equivalent jobs | | |
|---|---|---|---|---|---|---|---|---|
| | | | Employees | Self employed | Total | Employees | Self employed | Total |
| MCH libraries | M | I, P & E | | | | | | |
| Archives | M | I, P & E | | | | | | |
| Museums | M | All | | | | | | |
| Historical and archaeological sites and monuments | I&L | I, P & E | | | | | | |
| Conservation, restoration and other support activities | M&I | P | | | | | | |
| Agricultural landscape | L | T | | | | | | |
| Waterscape | L | T | | | | | | |
| Insurance of historic dwellings | I | T | | | | | | |
| Rehabilitation of historic buildings (including dwellings) | I | P | | | | | | |
| Real estate of historic dwellings | I | T | | | | | | |
| Antiques sale | M | T | | | | | | |
| Development and dissemination of MCH material and participatory activities through the work of volunteers | All | All | | | | | | |
| MCH Tourism | All | T | | | | | | |
| MCH associated education | All | I, P & E | | | | | | |
| MCH associated research (including archaeological excavations) | All | I & P | | | | | | |
| Non-market general administration services by Public Administration | All | All | | | | | | |
| **1. Total** | | | | | | | | |

### 5.4.2 Complementary module: Cultural heritage elements and institutions

The decision to implement this second complementary module is left to the discretion of those responsible for designing and executing the MCH Satellite Account in each country or region. However, HERMES recommends developing this module as it provides additional information about the reality of the sector, benefitting both policymakers in culture and cultural heritage, and the general public. This module aligns with the fourth objective of HERMES SA: to **serve as a framework for the collection of additional information**, not necessarily economic in nature, according to the sector's own categories and classifications. The implementation of the methodology proposed and the comparability of results among different countries or regions would benefit from the development of a good database on cultural heritage elements and institutions.

HERMES suggests that the Account managers in each country or region decide on the type of information to be included in this module. However, international sources offer reasonably comparable data on the following elements and institutions related to material cultural heritage:

**Table 9: International sources on cultural heritage elements and institutions**

| Type of heritage | Elements or institutions | Sources | Link |
|---|---|---|---|
| Movable | Number of museums or galleries | European Group on Museum Statistics | https://www.egmus.eu/ |
| | | Cultural Gems | https://cultural-gems.jrc.ec.europa.eu/map |
| | Number of MCH libraries (national & academic) | IFLA Library Map of the World | https://librarymap.ifla.org/map |
| | | Association of European Research Libraries (LIBER) | https://libereurope.eu/liber-participants/ |
| | | GeoNames Database | https://www.geonames.org/ |
| | | Europeana | https://www.europeana.eu/en |
| | Number of archives | Archives portal Europe | https://www.archivesportaleurope.net |
| Immovable | Buildings <1946 (number, m2 of floor area) | Census Hub | https://ec.europa.eu/CensusHub/selectHyperCube?clearSession=true |
| | | EU Building stock observatory | https://building-stock-observatory.energy.ec.europa.eu/database/ |
| | | European building stock characteristics | https://eubucco.com/ |
| | Number of listed buildings | World Heritage Sites | https://whc.unesco.org/en/syndication |
| | | National inventories | - |
| | Number of monuments | Wikipedia lists of monuments | https://www.wikilovesmonuments.org/ |
| Cultural landscape | Cultural protected area (km2) | World Database of protected areas | https://www.protectedplanet.net/en/thematic-areas/wdpa?tab=WDPA |
| | | Globally Important Agricultural Heritage Systems | https://www.fao.org/giahs/en |
| | | World Heritage Sites | https://whc.unesco.org/en/syndication |

| Type of heritage | Elements or institutions | Sources | Link |
|---|---|---|---|
| | Number of products with denomination of origin (PDO) | eAmbrosia | https://ec.europa.eu/agriculture/eambrosia/geographical-indications-register/ |
| | Water protected area (Km2) | FAO - FishStat | https://www.fao.org/fishery/en/fishstat |
| | | European Marine Observation and Data Network (EMODnet) | https://emodnet.ec.europa.eu/en |
| | | World Database of protected areas | https://www.protectedplanet.net/en/thematic-areas/wdpa?tab=WDPA |

## 5.5 General overview of estimation procedures

The primary operational objective of HERMES SA is to provide a supply table restricted to the activities of the HERMES key industries. Each of the HERMES key industries is a subset of the KAUs included in a particular IOF industry (see Table 5). Consequently, the IOF supply table becomes the primary source of information for HERMES SA. The estimation of the values of the main magnitudes (output, GVA, employment) associated with the HERMES industries can be approached as an estimation of the internal composition of the IOF industries.

An estimate of this nature requires information that allows for the quantitative determination of the part of each IOF branch that has an unequivocal relationship with the HERMES key industries. This general approach to the estimates can be expressed as follows:

$$O_{B,KI}^{IOF} = O_{B}^{IOF} \times \frac{P_{B,KI}^{OB}}{P_{B}^{OB}} \qquad \text{(Equation 1)}$$

Where:

$O_{B,KI}^{IOF}$ is the estimate of the value that the output of the key industry KI reaches within branch B in the IOF.

$O_{B}^{IOF}$ is the total output of branch B in the IOF.

$P_{B,KI}^{OB}$ is the observed value of a proxy P for the output of the key industry KI within branch B in the IOF.

$P_{B}^{OB}$ is the observed value of a proxy P for the output of the entire branch B in the IOF.

Equation (1), $\frac{P_{B,KI}^{OB}}{P_{B}^{OB}}$ acts as an estimation coefficient and represents the portion of production of branch B in IOF that should be accounted in the Key industry KI.

There are two alternative situations for calculating proxies related to each Key industry:

**Situation 1: Key Industries corresponding to the entirety of a specific NACE class**

These key industries are marked as 'complete' in Table 5. In these cases, the coefficient used for the estimation, $\frac{P_{B,KI}^{OB}}{P_{B}^{OB}}$, should be an approximation of the weight that the production of the NACE class has in branch B in IOF.

In the absence of more accurate methods, a coefficient can be obtained from the SBS, which provides information on the production (output) of each NACE class. On the other hand, the aggregation of NACE classes in each IOF branch is straightforward.

**Situation 2: Key Industries corresponding to part of a specific NACE class**

The second situation applies to the rest of the key industries, that is, all those defined as a part of a specific NACE class (and marked as 'partial' in Table 5). In this case, the estimation procedure involves two steps: the first is to identify the portion of the product (output) of the NACE class that can be attributed to the key industry; and the second is to identify the portion that the NACE class represents in the output of branch B in IOF. For this second step, the procedures described in Chapter 6 of this document can be followed.

In the first situation, a single coefficient (**coefficient 1**) is applied. This coefficient is calculated as:

$$\frac{P_{B,NC}^{O\ B}}{P_{B}^{OB}}$$

Where $P_{B,NC}^{O\ B}$ is a proxy for the production (output) of the NACE Class that corresponds to the Key industry KI, while $P_{B}^{OB}$ is a proxy for the production of branch IOF B in which that NACE class is included. In the absence of a better proxy, these values can be obtained from the SBS.

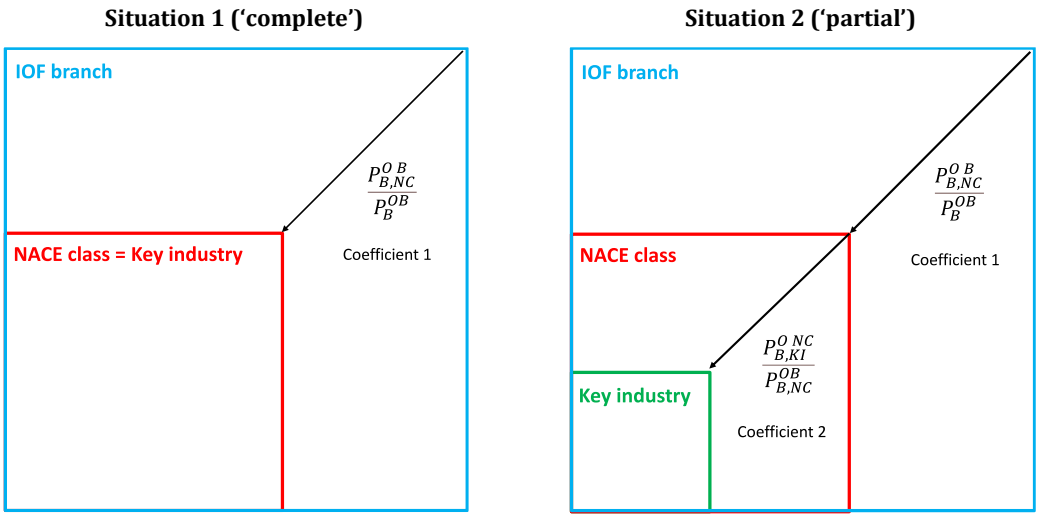
In the second situation, in addition to coefficient 1, another coefficient (**coefficient 2**), is needed to capture the relationship between the key industry KI and the NACE class in which it is included.

$$\frac{P_{B,KI}^{O\ NC}}{P_{B,NC}^{OB}}$$

Where $P_{B,KI}^{O\ NC}$ is a proxy of the production of the key industry KI and $P_{B,NC}^{OB}$ is the value reached by the same proxy for the production of the entire NACE class.

Figure 2 illustrates these two scenarios of the general procedure:

## Figure 2: Situations for calculating proxies related to key industries




An example of the calculation of coefficient 1 and coefficient 2 for a key industry is included in Annex 2 – Example of calculating coefficients 1 and 2 for the key industry '*Real estate of historic dwellings'* 2 (page 93).

HERMES SA foresees combining this general estimation method with other approaches that directly estimate the output value of the HERMES key industries within a specific IOF branch. For instance, the value of the production of non-market general administration services by Public Administration can be estimated using budgetary information available in each country and region.

Tourism industries represent another exception to the general rule. In this case, instead of using the *supply table* to determine the value of the production of the activity branches linked to the tourism industry (Accommodation and food service activities, air transport, etc.), it is recommended to use data on the production of specifically tourist services in these branches. In countries or regions with a Tourism Satellite Account (TSA), data on tourist services can be obtained directly from this source. For other countries, estimates can be made using information on the number of visitors, the value of the average stay, or, if applicable, the expenditure made by both foreign and domestic visitors. The estimation of the production of the Key Industry 'MCH Tourism' is then completed by applying a coefficient that represents the relationship between the tourist services derived from the tourism activity linked to the existence of the MCH (see Chapter 6 for coefficient calculation) and the total tourist services.

It is also necessary to deviate and adapt the general procedure for the key industry 'Development and dissemination of MCH material and participatory activities through the work of volunteers.' This key industry captures the value generated by voluntary activities carried out by individuals that are not accounted for in the central

framework of national accounts. To capture the value generated by these voluntary activities, it is necessary to directly estimate their value, for which the guidelines provided in Chapter 6 of this document can be followed.

In addition to the estimates related to the production value (output) of the key industries, HERMES provides other aggregates such as *Gross Value Added* (GVA) or *intermediate consumption* (Table 7). The general references for these values in each of the IOF branches can be obtained from the IOF *use* table, while the estimation of the value of these variables in the key industries can be obtained by applying the same procedures described for the output.

Finally, the estimates on employment and the remuneration of employees in the sector may require working with assumptions regarding the relationship between these variables and the gross value added in each branch of activity.

A general list of sources useful for estimation procedures is summarized as follows:

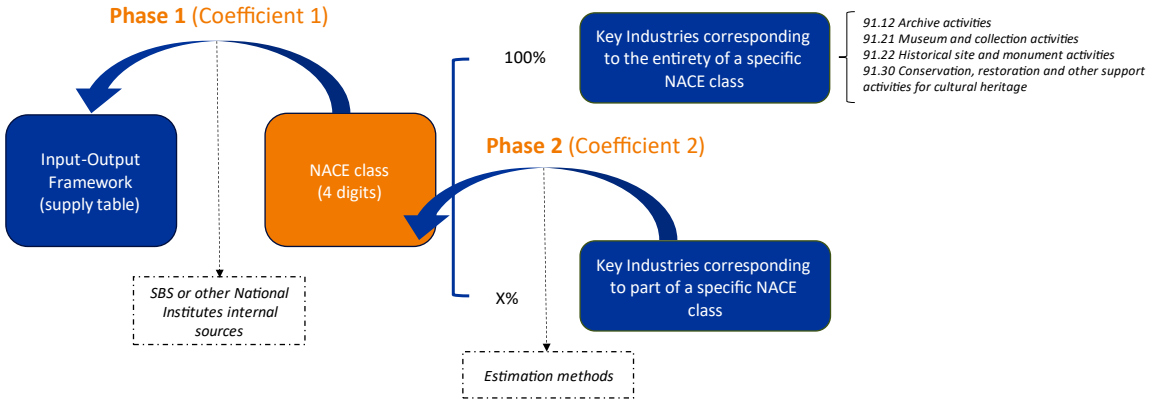
- The IOF supply table acts as the main source for the estimates and represents a solid value of the production of each IOF industry, internationally comparable.
- The Structural Business Statistics (SBS) of EUROSTAT and similar operations at the national and regional levels allow for the development of reasonable estimators for the breakdown of IOF industries into more detailed activity branches (down to the class level in NACE).
- Information from public budgets and budget statistics can be useful for estimating the value of non-market production in the sector and its corresponding GVA.
- Up to 27 European countries compile Tourism Satellite Accounts (TSA) and report their results to EUROSTAT (EUROSTAT, 2023). There are also experiences of TSA preparation in various regions of Europe. Finally, when there are no regional or national data, these can be estimated using information on the number of visitors, average stay, tourism expenditure, or levels of occupancy of tourism infrastructure.
- National and international databases on the activity of some of the most important institutional units of certain HERMES industries, such as national libraries.
- Information on time use from the Harmonised European Time Use Surveys (HETUS) and other similar national and regional experiences.
- Information from platforms like Wikipedia and YouTube, including measures of the content published each year (EUIPO, 2019).

# 6 Estimation procedures

In Chapter 5 of this document, the structure of HERMES SA was established, as well as the basic procedures for its execution. For HERMES key industries, the procedure for estimating their production (output) and gross value added was described in two phases:

- The application of 'coefficient 1' for estimating the part of each IOF activity branch that corresponds to the NACE class in which each *key industry* is located. According to the delimitation of HERMES key industries, it is necessary to apply coefficient 1 in all of them to estimate their main aggregates (production, GVA, employment, etc.). This coefficient can be obtained, in the absence of a better method and with the corresponding precautions, from the internal composition observed in SBS of production, GVA, or employment in the different NACE classes that make up each IOF branch by aggregation.
- The application of 'coefficient 2' for estimating the part of the activity of a given NACE class that corresponds to a specific *key industry*. Its application is only necessary for those HERMES key industries which don't cover the entirety of a NACE class, but only a part of it. In other words, coefficient 2 only applies to the key industries marked as 'partial' in Table 5.

**Figure 3: Phases of the production (output) calculation method of key industries**




Some key industries are identified as particular cases where the estimation procedures do not start from the production or value-added values of the IOF branches. This circumstance occurs, for example, in MCH Tourism, the '*Development and dissemination of MCH material and participatory activities through the work of volunteers*', or '*Non-market general administration services by Public Administration*'. In the list of procedures that follow, general guidelines for action are also established for these particular cases.

Table 10 presents all HERMES key industries, identifying those which require estimation procedures additional to the application of coefficient 1, and thus constitute a complete index of the cases to be addressed in the Chapter 5.

**Table 10: Relation between key industries and classifications and estimation need**

| Key industries | Input- Output branch | Related NACE Rev. 2.1 | Estimation required |
|---|---|---|---|
| MCH libraries | Creative, arts and entertainment activities; libraries, archives, museums and other | 91.11 Library activities | Yes |
| Archives | | 91.12 Archive activities | No |
| Museums | | 91.21 Museum and collection activities | No |

| Key industries | Input- Output branch | Related NACE Rev. 2.1 | Estimation required |
|---|---|---|---|
| Historical and archaeological sites and monuments | cultural activities; gambling and betting activities *[NACE S90-92]* | 91.22 Historical site and monument activities | No |
| Conservation, restoration and other support activities | | 91.30 Conservation, restoration and other support activities for cultural heritage | No |
| Agricultural landscape | Crop and animal production, hunting and related service activities *[NACE A01]* | 01.1 Growing of non-perennial crops | Yes |
| | | 01.2 Growing of perennial crops | Yes |
| | | 01.4 Animal production | Yes |
| | | 01.50 Mixed farming | Yes |
| | | 01.6 Support activities to agriculture and post-harvest crop activities | Yes |
| Waterscape | Fishing and aquaculture *[NACE A03]* | 03 Fishing and aquaculture | Yes |
| Insurance of historic dwellings | Insurance, reinsurance and pension funding, except compulsory social security *[NACE L65]* | 65.12 Non-life insurance | Yes |
| Rehabilitation of historic buildings (including dwellings) | Construction *[NACE F]* | 43.99 Other specialised construction activities n.e.c. | Yes |
| | Architectural and engineering activities; technical testing and analysis *[NACE N71]* | 71.11 Architectural activities | Yes |
| Real estate of historic dwellings | Imputed rents of owner-occupied dwellings *[NACE M68.2]* | - | Yes |
| | Real estate activities excluding imputed rents *[NACE M]* | 68.20 Rental and operating of own or leased real estate | Yes |
| | | 68.31 Intermediation service activities for real estate activities | Yes |
| | | 68.32 Other real estate activities on a fee or contract basis | Yes |
| Antiques sale | Retail trade, except of motor vehicles and motorcycles *[NACE G47]* | 47.79 Retail sale of second-hand goods | Yes |
| | | 47.9 Intermediation service activities for retail sale | Yes |

| Key industries | Input- Output branch | Related NACE Rev. 2.1 | Estimation required |
|---|---|---|---|
| Development and dissemination of MCH material and participatory activities through the work of volunteers | Activities of households as employers; undifferentiated goods- and services-producing activities of households for own use *[NACE U]* | 98.2 Undifferentiated service-producing activities of private households for own use | Yes |
| | Activities of membership organisations *[NACE T94]* | 94.99 Activities of other membership organisations n.e.c. | Yes |
| MCH Tourism | Land transport and transport via pipelines *[NACE H49]* | 49.1 Passenger rail transport | Yes |
| | | 49.3 Other passenger land transport | Yes |
| | Water transport *[NACE H50]* | 50.1 Sea and coastal passenger water transport | Yes |
| | | 50.3 Inland passenger water transport | Yes |
| | Air transport *[NACE H51]* | 51.1 Passenger air transport | Yes |
| | Accommodation and food service activities *[NACE I]* | 55 Accommodation | Yes |
| | | 56 Food and beverage service activities | Yes |
| | Travel agency, tour operator reservation service and related activities *[NACE O79]* | 79 Travel agency, tour operator and other reservation service and related activities | Yes |
| | Rental and leasing activities *[NACE O77]* | 77.11 Rental and leasing of cars and light motor vehicles | Yes |
| | Creative, arts and entertainment activities; libraries, archives, museums and other cultural activities; gambling and betting activities (except for cultural activities associated to MCH) *[NACE S90-92]* | 90-92 Excluding those considered as MCH activities | Yes |
| MCH associated education | Education *[NACE Q85]* | 85.3 Secondary and post-secondary non-tertiary education | Yes |
| | | 85.4 Tertiary education | Yes |
| | | 85.5 Other education | Yes |
| MCH associated research (including archaeological excavations) | Scientific research and development *[NACE N72]* | 72.10 Research and experimental development on natural sciences and engineering | Yes |
| | | 72.20 Research and experimental development on social sciences and humanities | Yes |

| Key industries | Input- Output branch | Related NACE Rev. 2.1 | Estimation required |
|---|---|---|---|
| Non-market general administration services by Public Administration | Public administration and defence; compulsory social security<br>*[NACE P84]* | 84.11 General public administration activities | Yes |

This section provides an overview of the methodologies and procedures designed to support calculations needed for those key industries requiring estimations that go beyond the application of coefficient 1 requiring coefficient 2. These procedures are diverse, as is the nature of the activities considered in each key industry and their relationship with the corresponding NACE class. The sources on which the calculation is based are also very varied, although a common criterion has been applied in their identification: that they provide homogeneous information relative to most countries or regions in Europe. A summary of estimation procedures and sources is provided in Annex 3.

The described procedures should be understood as a non-prescriptive guide made available to the Satellite Account managers in each country/region, each of whom may have other databases and statistical sources and adapt the procedures described here to the institutional reality of the territory where the methodology is applied.

Notably, many of these estimation techniques and the identification of data sources also aid in the territorialization of data at the NUTS 3 level, facilitating sub-national breakdowns for values that are typically available only at the national level.

To perform these calculations effectively, it is often necessary to first determine the baseline population of Material Cultural Heritage (MCH), based on the categories and definitions established in the conceptual framework. The aim is to offer a methodology that is universally applicable across most countries, ensuring the production of comparable data.

Certain baseline population categories are relevant to multiple key industries and are therefore addressed collectively in Section 6.1. For example, agricultural landscapes and waterscapes utilize the "cultural landscape" population baseline, while insurance of historic dwellings, rehabilitation of historic buildings (including dwellings), and real estate of historic dwellings rely on the "historic dwellings" population baseline as their starting point. The estimation procedures for all key industries, along with specific population baselines of key industries, are comprehensively detailed in Section 6.2.

## 6.1 Baseline population categories applicable to multiple key industries

### 6.1.1 Cultural landscapes

Despite focusing on material cultural heritage, the HERMES project chose to include cultural landscapes as a category, as the interaction between people and the natural environment. Identifying the material and cultural components of these complex areas is not straightforward, as they often serve as a bridge between intangible heritage and tangible elements. Examples include traditional craftsmanship, such as woodworking, weaving, and pottery, as well as culinary heritage, which can lead to European geographical indications like Protected Designation of Origin (PDO). These landscapes also encompass both natural and cultural aspects. While cultural seascapes lack a single, unified legal designation they reflect the interaction between humans and marine environments. They may, however, receive protection under various international or national frameworks.

The official designations for cultural landscapes differ based on context, country, and organization. For the HERMES project, the following categories and designations are considered particularly relevant:

- **UNESCO World Heritage Sites (WHS)**: The focus is on outstanding universal value (OUV), often requiring a more static, universally recognized significance.
    - Cultural landscapes (recognized under the 1992 revision of the UNESCO World Heritage Convention): recognize landscapes that represent the interaction between humans and their environment, specially designed landscapes and organically evolved landscapes

- Mixed Heritage Sites: are WHS that hold both cultural and natural OUV, where the cultural and natural elements are inseparable or highly interrelated.

UNESCO recognizes that the concept of cultural landscapes can extend to cultural seascapes if they demonstrate the dynamic interaction between humans and the marine environment. Nevertheless, traditional knowledge, practices, and rituals tied to marine environments can be recognized under the Intangible Cultural Heritage Convention.

- **Globally Important Agricultural Heritage Systems (GIAHS).** Designated by the FAO, GIAHS focuses on sustainable agricultural systems that have evolved over generations, integrating biodiversity, traditional knowledge, and cultural heritage. These systems are recognized for their dynamic interaction between humans and the environment, contributing to food security and rural livelihoods.
- **Natura 2000**. Protects habitats and species, primarily for their ecological value. While it focuses primarily on natural features, many sites also have cultural or historical significance. It also includes marine protected areas with cultural and ecological significance, such as areas where traditional fishing or maritime practices maintain biodiversity.
- **National or regional-level Protected Areas**. Many countries have frameworks for designating and protecting cultural landscapes at a national or regional level, including those areas that embody traditional ecological knowledge or indigenous practices.
- **Other types of designation**. Include the European Landscape Convention, which promotes the protection and sustainable management of all types of landscapes, from natural to urban; Ramsar Sites under the Ramsar Convention, which focus on wetlands of international importance, including coastal and marine wetlands with cultural and ecological value; Biosphere Reserves under UNESCO's Man and the Biosphere Program, which integrate cultural and natural heritage conservation; GeoParks, recognized for their geological and cultural significance.

**Overlapping in protected areas delineation**

While the different type of designation for cultural landscapes are distinct in their objectives and criteria, they share a common focus on the sustainable relationship between humans and nature.

Overlaps occur for example when GIAHS also exhibit outstanding universal cultural or natural value (WHS), as they both emphasize the interplay between cultural practices and natural systems over time, highlight the importance of traditional knowledge in shaping and maintaining these landscapes and recognize biodiversity as an integral part of human culture. Nevertheless, not all GIAHS are WHS, as designation does not require the site to meet the rigorous OUV criteria of WHS and they may be regionally significant but lack the global recognition required for WHS status and not all WHS are GIAHS, as many WHS cultural landscapes are not actively agricultural or do not meet GIAHS's focus on sustainability and food systems. While Natura 2000 focuses primarily on natural features, many sites also have cultural or historical significance that might align with WHS or GIAHS criteria. Many GIAHS sites in Europe may partially or entirely overlap with Natura 2000 areas because traditional agricultural systems often maintain high biodiversity, fulfilling Natura 2000 habitat and species requirements. Furthermore, many WHS cultural landscapes in Europe overlap with Natura 2000 due to their ecological significance alongside cultural value.

**Data source useful for calculation:**

The World Database on Protected Areas (WDPA), managed by the UNEP-WCMC (United Nations Environment Programme World Conservation Monitoring Centre), is the most comprehensive global database of protected areas. It includes terrestrial and marine protected areas that are formally recognized by national governments or international agreements, such as:

- National parks
- Ramsar wetlands
- UNESCO Biosphere Reserves
- UNESCO WHS (only natural or mixed sites)

Natura 2000 sites are often included in the WDPA because they meet the criteria for "protected areas" as defined by the International Union for Conservation of Nature (IUCN). While the WDPA aims to include all Natura 2000 sites, gaps in data submissions by EU member states can result in incomplete coverage.

The use of this database allows to avoid double counting while delineating protected areas. Nevertheless, GIAHS are not considered as a category of protected areas and should be therefore added separately. Special attention should be paid to the overlapping of this designation with others.

### Table 11: Data sources useful for cultural landscape area calculation

| Name | Link | Description |
|---|---|---|
| World Database on Protected Areas | https://www.protect-edplanet.net/en/thematic-areas/wdpa?tab=WDPA | Global database of marine and terrestrial protected areas updated on a monthly basis. |
| Globally Important Agricultural Heritage Systems (GIAHS) | https://www.fao.org/giahs/en | List of agricultural heritage around the world by country |
| eAmbrosia | https://ec.europa.eu/agriculture/eambrosia/geographical-indications-register/ | Legal register of the names of agricultural products, wine, and spirit drinks that are registered and protected across the EU. |
| European Route of Historic Gardens | https://www.europeanhistoricgardens.eu/en/gardens | Certified as a Cultural Route of the Council of Europe, acknowledges the values its historic, artistic, social and natural heritage. |
| Park and gardens | https://europeangardens.eu/en/european-inventories-2/european-inventories/ | Public and private inventories relating to European garden art (available for France, Portugal, Belgium (Wallonia and Flanders), England and Italy |
| Historic Parks and Gardens - National | https://data.europa.eu/data/datasets/historic-parks-and-gardens-national?locale=en | Calderdale Metropolitan Borough Council |

### 6.1.2 Historic dwellings

Similar to ESPON HERITAGE, HERMES employs a methodology, which uses a coefficient to isolate the contribution of immovable material cultural heritage to the real estate, insurance and rehabilitation sectors, suggesting expanding the pre-1919 and select pre-1946 dwellings. The justification for this choice is rooted in several factors: i) Pre-1946 dwellings represent a data category that is consistently available at the NUTS 3 regional level across Europe, facilitating comparative analysis; ii) the pre-1946 cut considers almost all heritage related buildings with architectural, cultural, or historical significance, including the constructive period related to World War II; iii) transactions related to these sectors are more commonly collected, recorded and analysed at the level of individual dwellings rather than entire buildings.

The selection of pre-1946 dwellings as a proxy for immovable MCH's contribution to some key industries is therefore a pragmatic choice grounded in data availability, transaction representativeness, and relevance to the heritage context. The methodology proposed to estimate this coefficient acknowledge some limitations, as it does not account for non-residential heritage properties, which are also part of these transactions, but correlations can be proposed between the presence of pre-1946 dwellings and the total number of dwellings, providing a foundation for further methodological developments. However, there are promising opportunities for refinement. For example, some existing databases now collect floor area data by construction period, which, while currently only available at the country level, could be expanded and localized for more accurate estimations. These advancements, together with future enhancements in data collection and integration, could allow to overcome current challenges and improve calculations of immovable MCH's contribution, offering a more comprehensive view of its economic role.

**Table 12: Data sources useful for historic dwellings calculation**

| Name | Link | Description |
|---|---|---|
| Census Hub | https://ec.europa.eu/CensusHub/selectHyperCube?clearSession=true | Main tool of housing census in the EU, available at NUTS3, proving number of dwellings per construction period |
| EU Building stock observatory | https://building-stock-observatory.energy.ec.europa.eu/database/ | Provides number of buildings, dwellings, useful floor area per construction period, per country |
| European building stock characteristics | https://eubucco.com/ | Currently the share of data covering the year of construction is low, but may provide insights in future |
| National cadastres | https://inspire-geoportal.ec.europa.eu/srv/eng/catalog.search#/overview?view=themeOverview&theme=cp | The cadastre is an alternative source for building stock characterization per country, although requires specific GIS processing for data extraction. |

## 6.2 Estimation procedures for coefficient 2 application

### 6.2.1 MCH libraries

Libraries traditionally focus on the collection of resources, providing retrial and access to information, both physical and digital. As the International Federation of Library Associations and Institutions (IFLA) highlights, safeguarding and providing access to documentary works in all formats is central to the mission of libraries globally (IFLA, 2019). Cultural heritage is kept in different libraries, but not all libraries host cultural heritage collections. While national libraries are widely recognized as guardians of a nation's cultural heritage and academic libraries play a critical role in preserving specialized collections for research and education, public libraries may hold collections, such as community archives, oral histories, and regional artifacts, that represent cultural heritage. However, it is challenging to estimate the percentage of public libraries actively hosting such materials and engaging in cultural heritage preservation due to a lack of comprehensive data and the decentralized and variable nature of their collections and initiatives. HERMES therefore suggests adopting a conservative approach by focusing on national and academic libraries in assessing the economic contribution, as these institutions provide clear, well-documented, and measurable examples of cultural heritage preservation and access, ensuring a robust and credible foundation for estimates. Furthermore, recent and increasing effort in digitization are producing changes in libraries' activities and management, increasing their importance, enabling broader access and ensuring safeguarding of fragile materials. Again, national and academic libraries often have established digitization programs and publicly accessible records of their collections and initiatives, such as virtual exhibitions, making their impact easier to assess.

**Table 13: Data sources useful for MCH libraries calculation**

| Name | Link | Description |
|---|---|---|
| IFLA Library Map of the World | https://librarymap.ifla.org/map | Provides national level data by type of libraries in all regions of the world. |
| Association of European Research Libraries (LIBER) | https://libereurope.eu/liber-participants/ | Network of research libraries across Europe (georeferenced data) |
| GeoNames Database | https://www.geonames.org/ | Geographical database that includes data on libraries |

| Name | Link | Description |
|---|---|---|
| Europeana | https://www.europeana.eu/en | Aggregates digital collections from libraries, archives, and museums across Europe. While it focuses on digitized materials, it also provides some metadata about contributing libraries. |
| National Library Directories | | National registries of libraries that may include georeferenced data |

### 6.2.2 Agricultural landscape

To estimate the contribution of cultural landscapes to the agricultural sector, a methodology is proposed that calculates the share of land that is both agricultural and protected.

The calculation of agricultural areas is based on the Corine Land Cover (CLC) classification, specifically focusing on **Class 2: Agricultural areas**. The following subclasses are included:

2.1 Arable land

2.1.1 Non-irrigated arable land

2.1.2 Permanently irrigated land

2.1.3 Rice fields

2.2 Permanent crops

2.2.1 Vineyards

2.2.2 Fruit trees and berry plantations

2.2.3 Olive groves

2.3 Pastures

2.3.1 Pastures

2.4 Heterogeneous agricultural areas

2.4.1 Annual crops associated with permanent crops

2.4.2 Complex cultivation patterns

2.4.3 Land principally occupied by agriculture, with significant areas of natural vegetation

2.4.4 Agro-forestry areas

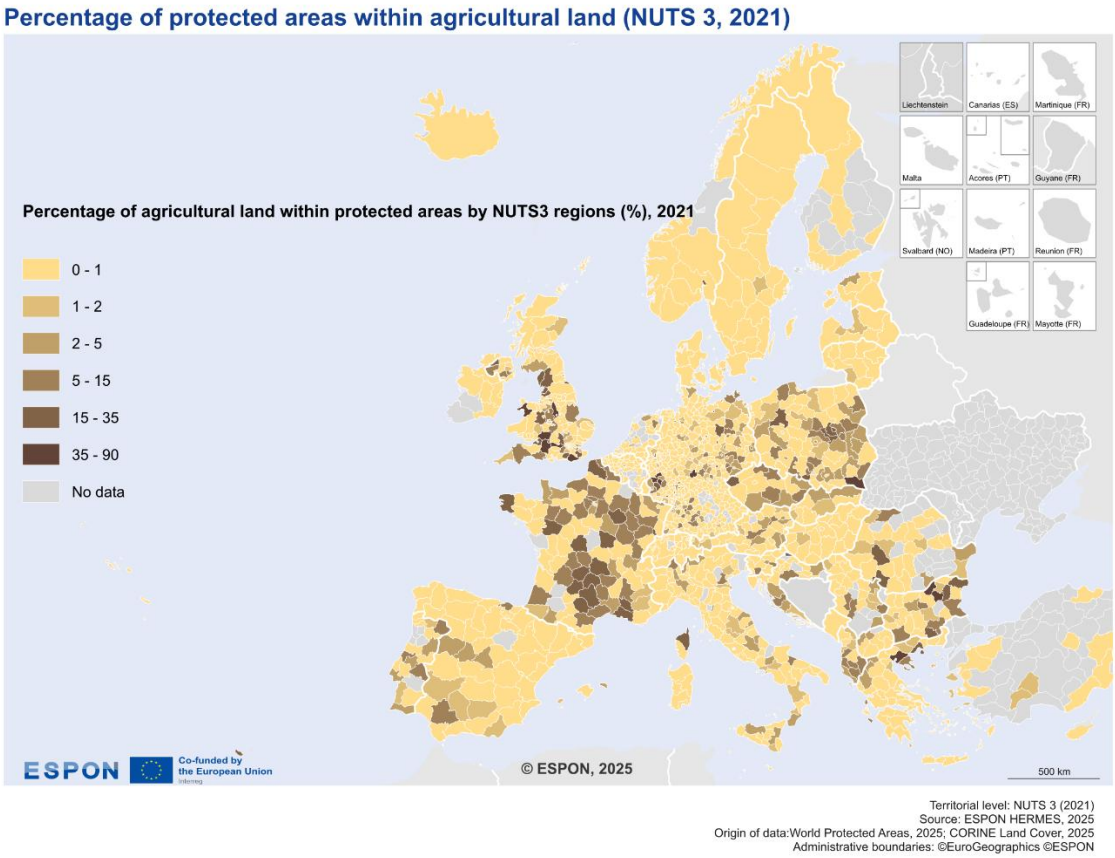
The total agricultural area is calculated by summing the areas of these subclasses at the desired level of analysis. Since the data are geolocated, agricultural land can be determined for any representative unit of analysis (e.g., NUTS3 or lower).

Protected areas are calculated according to the methodology described in Section 6.1.1. As it based on a geolocated approach, it enables the determination of protected land within the same representative unit of analysis.

The next step is to identify the overlap between agricultural land and protected areas. By calculating the percentage of agricultural land that falls within protected areas, the contribution of cultural landscapes to overall agricultural activity can be quantified.

The following map shows the percentage of agricultural landscapes, considered as agricultural areas with a protection status.

## Map 1: Percentage of protected areas within agricultural land




The integration of Protected Designations of Origin (PDOs) into geospatial analysis offers an additional valuable approach to evaluating the interplay between cultural landscapes and their economic contributions. PDOs are deeply tied to the cultural and ecological uniqueness of specific regions, representing both tangible and intangible heritage, and their spatial analysis can reveal significant insights into the socio-ecological values of agricultural landscapes, correlating with areas of high nature value farmland, semi-natural agriculture (Flinzberger et al., 2022)). By quantifying the intangible and subjective aspects of landscapes, such as their cultural value reflected in PDOs, geospatial analyses can operationalize complex cultural indicators. This mapping helps to evaluate the extent and distribution of cultural and ecological benefits provided by agricultural landscapes (Tieskens et al., 2017). Flinzberger et al. (2022) highlighted the lack of EU-wide spatial data for PDOs, which hampers understanding of product-landscape relationships. By mapping 638 PDO-labelled products using NUTS-3 areas as proxies, the study revealed significant overlaps between PDO presence and social-ecological indicators such as tourism potential and cultural heritage.

Integrating PDO data into geospatial analyses provides a framework for better understanding the economic contribution of cultural landscapes to the agricultural sector. Nevertheless, a relative weight by country should be established to incorporate this category into the overall analysis and define how PDOs influence the economic contribution.

## Table 14: Data sources useful for agricultural landscapes calculation

| Name | Link | Description |
|---|---|---|
| Corine Land Cover | https://land.copernicus.eu/en/products/corine-land-cover | Pan-European land cover and land use inventory with 44 thematic classes |

| Name | Link | Description |
|---|---|---|
| World Database on Protected Areas | https://www.protectedplanet.net/en/thematic-areas/wdpa?tab=WDPA | Global database of marine and terrestrial protected areas updated on a monthly basis. |

### 6.2.3 Waterscape

Waterscapes are a specific representation of cultural landscapes, offering a rich interplay between tangible and intangible heritage. As highlighted in recent literature, waterscapes, including inland fisheries and coastal areas, contribute significantly to cultural identity, community cohesion, and regional sustainability (Khakzad & Griffith, 2016; Martino et al., 2023). Their economic contribution, though often underreported, is multifaceted, encompassing direct and indirect impacts on tourism, food security, and cultural ecosystem services (Lynch et al., 2016; Pascoe et al., 2023).

Efforts to estimate the economic value of waterscapes has been addressed by different methodologies such as discrete choice experiments, which capture consumer preferences for cultural and heritage attributes ((Martino et al., 2023)), and ecosystem service valuation frameworks that integrate both market and non-market values (Gómez & Maynou, 2021). These approaches address challenges in quantifying the sociocultural benefits of waterscapes, such as their role in creating a sense of place and supporting livelihoods rooted in local traditions. Additionally, other techniques, such as combining participatory research with spatial data analysis, can enhance understanding of the heritage density associated with waterscapes, contributing to more robust policy frameworks (Gómez, 2018, pp. 201–217).

Protected Designations of Origin (PDOs) are also applicable to products from fisheries and aquaculture. PDO certification in these sectors recognizes the unique qualities of fishery and aquaculture products that are intrinsically linked to specific geographical areas and traditional practices. Many PDO fishery and aquaculture products reflect the cultural identity of coastal and inland regions. They embody the relationship between local communities and their aquatic environments, contributing to cultural landscapes. Mapping PDO-designated fishery and aquaculture areas can help evaluate their contribution to local and regional economies.

**Table 15: Data sources useful for waterscapes calculation**

| Name | Link | Description |
|---|---|---|
| FAO - FishStat | https://www.fao.org/fishery/en/fishstat | Global fishery and aquaculture statistics |
| European Marine Observation and Data Network (EMODnet) | https://emodnet.ec.europa.eu/en | Marine and coastal data for Europe, with a focus on biodiversity, geology, and human activities (including cultural heritage) |
| Local and Regional Fisheries Surveys | | May include data on small-scale and artisanal fisheries. |

### 6.2.4 Insurance of historic dwellings

Insurance related to historic buildings represents a significant economic activity related to MCH. The primary challenge lies in estimating how much of the NACE classification *65.12 Non-life insurance* pertains specifically to real estate insurance, and of that, how much can be attributed to historic properties.

To determine the percentage of the NACE class associated with real estate insurance, sources such as Insurance Europe can be helpful. Insurance Europe provides statistics of the European insurance industry, categorized by country and type of insurance. It classifies insurance into three main categories: *Life*, *Health*, and *Property & Casualty (P&C)*. P&C insurance is further divided into three subcategories: *Motor*, *Property*, and *General Liability*. When aligning these categories with NACE class *65.12 Non-life insurance*, Health and P&C insurance are the categories belonging to this classification. Within P&C, the "*Property*" subcategory is the most aligned segment related to real estate insurance. This could be a good starting point to approximate the weight of real estate property insurance within NACE class 65.12 for each country.

After determining the share of real estate insurance, a further estimation is required to isolate the portion related to buildings or dwellings, categorized by construction period. As proposed in other industries, focusing on dwellings provides a more accurate and practical perspective. This is because the analysis of the insurance market is more commonly structured and issued at the dwelling level rather than the building level, especially in cases where a building contains multiple units or serves as a multi-purpose structure. For this estimation, in order to identify the contribution of MCH to the sector, the selection of dwelling built before 1946 is proposed (see Section 6.1.2), as this category includes the majority of historic buildings and data are consistent and available at NUTS3 level across Europe.

**Table 16: Data sources useful for historic dwellings' insurance calculation**

| Name | Link | Description |
|---|---|---|
| Insurance Europe | https://insuranceeurope.eu/ | Provides statistics of European insurance industry per country allowing the possibility of estimate the percentage represented by property. |

### 6.2.5 Rehabilitation of historic buildings (including dwellings)

The activity of building rehabilitation has been identified as being mainly linked to two NACE classes, belonging to different I-O branches. These are: *71.11 Architectural activities* and *43.99 Other specialised construction activities n.e.c.*

Class 71.11 belongs to the branch of *Architectural and engineering activities; technical testing and analysis*, and is specifically selected because its description includes, among other activities, *'architectural activities to support the conservation and restoration of cultural heritage properties'*. Additionally, by analysing the products associated with this in the CPA, there is a specific one called *'71.11.23 Historical restoration architectural services'* which unequivocally indicates the relationship of this activity with the MCH sector linked to historical restoration.

Class 43.99, on the other hand, is an activity that encompasses various specialized construction services, including specifically *'renovation, renewal, reconstruction, and retrofitting of historical and archaeological sites and buildings'*. This NACE class has been identified by both the ESPON HERITAGE project and CHARTER (Charter project, 2023; ESPON HERITAGE, 2019). However, in this case, when reviewing the CPA linked to this activity, there are no sub-products as clearly identifiable with the rehabilitation of historical buildings as in 71.11, since the products linked to this NACE class are subdivided into specific trades activities (such as scaffolding works, concreting works, masonry and bricklaying works, etc.) and a general one, *'43.99.90 Specialised construction works n.e.c.'* which includes things like: construction works of factory chimneys, outdoor swimming pools, refractory linings for furnaces, etc. It is considered that in this case, the rehabilitation of buildings may be generally linked to the activities of the different trades in a certain percentage, but to do so, it should first be determined how much of class 43.99 could be attributed to rehabilitation to later estimate the part linked to historical buildings or dwellings.

Given these difficulties, different possible estimation strategies are proposed:

1. If statistical institutes have more detailed information, the percentage that building rehabilitation represents in these NACE classes could be estimated from this data.
2. Other possible sources that could facilitate this estimation could be national registers that identify companies specialized in rehabilitation. In some countries, it is also necessary to have an official certification for the rehabilitation of historical buildings, although it is understood that this would be linked to those of greater protection or value, but it is probably not necessary for the rehabilitation of dwellings in historical buildings of lesser protection. Perhaps the register of specialized companies could be used to estimate the weight of activity 71.11, and the weight of 43.99 could be extracted by estimating the percentage of the class dedicated to the rehabilitation of dwellings, and on this percentage apply the percentage of dwellings built before 1946 to estimate a specific contribution of the MCH.
3. Finally, in the absence of sources that allow such precision, more general statistics can be used to estimate the percentage that the rehabilitation sector represents over the total construction sector. An

example of this is the Architect Council of Europe or the European Construction Industry Federation (FIEC). FIEC indicates that 30% of the activities in the construction sector in Europe are due to rehabilitation. If a percentage of this type is applied, it should be applied not to the mentioned NACE classes, but to the total I-O branches they are part of. And again, once this percentage is applied, it should then be specified to the volume of buildings, dwellings or floor area (check section 6.1.2) built before 1946 to specify the contribution of the MCH.

**Table 17: Data sources useful for rehabilitation of historic buildings calculation**

| Name | Link | Description |
|---|---|---|
| FIEC – European Construction Industry Federation | https://fiec-statistical-report.eu/2021/european-union | This source analyses construction sector figures per subsector giving average investment and GDP data per Europe and some countries. |
| ACE – Architects' Council of Europe | https://ace-cae.eu/ and https://aceobservatory.com/Home.aspx?Y=2018&c=Europe&l=EN | The ACE has a specific observatory in which specific figures for architects practice is analysed per country. There are also percentages per type of work[28] considering: refurbishment, cultural heritage and new built. |

### 6.2.6 Real estate of historic dwellings

Real estate activities related to immovable material cultural heritage, such as the selling and renting of heritage properties, are integral to the trade function of the value chain. According to the research performed by the ESPON HERITAGE project, a key challenge in estimating the impact of MCH on the real estate sector lies in the scarcity and fragmentation of relevant data, especially due to the sensitive nature of real estate information, often guarded by private companies and stakeholders.

Given the current and demonstrated limitations, the activities considered in HERMES to delineate the real estate sector include the, renting of properties, and agency/management services associated. Notably, the '*development of building projects*' is excluded from this scope, as it typically does not align with MCH-related real estate activities, and also the purchase and sale of buildings have been excluded due to the orientation of HERMES to focus on the value generated by MCH, not the MCH monetary value itself.

Regarding the estimation to be made, it is relevant to mention that there are two I-O branches linked to real estate activity: *'Real estate activities excluding imputed rents'* and *'Imputed rents of owner-occupied dwellings'*. To estimate their contribution more accurately, in relation to MCH, *'Imputed rents of owner-occupied dwellings'* branch should be accounted 100%, and in the case of *'Real estate activities excluding imputed rents'* the weight to be considered will depend on the NACE classes selected as part of the key industry. Once coefficient 1 is calculated, the percentage of dwellings built before 1946 should be applied (see Section 6.1.2) to both branches. An example of application of the estimation of this key industry is available in Annex 2.Annex 2 – Example of calculating coefficients 1 and 2 for the key industry '*Real estate of historic dwellings*'

[28] https://aceobservatory.com/M_Type.aspx?Y=2018&c=Europe&l=EN

**Table 18: Data sources useful for real estate of historic dwellings calculation**

| Name | Link | Description |
|---|---|---|
| "Heritage Houses for Europe" – The first Pan-European study on family-owned heritage houses | https://op.europa.eu/en/publication-detail/-/publication/bc6dd18f-ddba-11e9-9c4e-01aa75ed71a1/language-en | European Commission: Directorate-General for Education, Youth, Sport and Culture, Durinck, E., Maret, L., Orban, M., Dupeux, D. et al., Study of "Heritage Houses for Europe" – The first Pan-European study on family-owned heritage houses – Assessing their added value for Europe as well as identifying innovative business models, Publications Office, 2019 |

### 6.2.7 Antiques sale

For the case of antique sales, two related NACE classes have been identified: *47.79 Retail sale of second-hand goods* and *47.9 Intermediation service activities for retail sale*. Class 47.79 specifically includes the sale of antiques, and class 47.9 includes the activity of auction houses. In both cases, it is difficult to discern the percentage that these sub-activities might represent within the mentioned NACE classes, and no specific source has been found to facilitate this operation.

However, it is known that, to prevent the illicit trafficking of goods, some countries keep a register of companies dedicated to the sale of antiques. This can be a good starting point to gather a list of companies engaged in this activity and estimate their relative weight within the total of the mentioned NACE branches using complementary sources.

### 6.2.8 Development and dissemination of MCH material and participatory activities through the work of volunteers

As highlighted in Chapter 4, the role volunteering is essential to the heritage industry, providing significant benefits to both individuals and organizations. Not only does volunteering support the preservation and dissemination of cultural heritage, but it also makes a significant contribution to the personal and professional growth of those who volunteer. However, the current data sources within the heritage industry do not account for such informal employment (ALMA ECONOMICS, 2024) and there is limited information on how many people volunteer in the sector's organizations (ESPON HERITAGE, 2019).

The relevance of volunteering, not only for the heritage sector, varies according to each country. Unfortunately, the social sector is present but invisible in national accounts and volunteering isn't even counted (Kenley, 2021). In 2010, the Education, Audiovisual and Culture Executive Agency managed by the Directorate General for Education and Culture of the European Commission commissioned a study on volunteering in the EU (GHK, 2010). The report highlights that approximately 92 to 94 million adults in the European Union are engaged in volunteering and notes significant variations in volunteering levels across Member States, with countries like Austria, the Netherlands, Sweden, and the UK showing very high participation rates exceeding 40%. Worthy noting that there exists a growing demand to create a "third sector" or social economy satellite account to formally capture the impact of all charities and volunteering activities in the UK, which are vital to the heritage sector in that country (ALMA ECONOMICS, 2024). Furthermore, the GHK's report emphasizes the need for better data collection and analysis to understand the economic value of volunteering. Derived from that study, a list of country reports was produced and national data can be obtained.

The accounting of the value generated through volunteer work faces serious difficulties within the central framework of national accounting. When volunteer work occurs within Non-profit Institutions Serving Households, production is valued through costs, including those associated with employee remuneration. However, volunteer work, despite its undeniable value, does not generate any form of remuneration by definition. Furthermore, the central framework of national accounting does not consider the activities of household members aimed at the production of goods and services, except in certain cases related to production for own use. Consequently, the time dedicated to activities such as MCH dissemination—a rapidly growing area—and the value generated through these activities are not measured within the central framework and, therefore, do not contribute to a

country's GDP. HERMES proposes the inclusion of the value generated through volunteer work within the MCH sector, which implies the expansion of the production boundary of the central framework.

Some efforts to extend the System of National Accounts (SNA) to include the value of volunteer work exist. EUIPO describes and develops some proposals that outline approaches and procedures that can be applied in estimating the value of volunteer work in the cultural and creative industries sector. The application of these methods would provide a more accurate representation of the economic contributions made by volunteers, particularly in the context of digital platforms (EUIPO, 2019). In the more restricted scope of MCH, ESPON HERITAGE also argues that volunteers play a crucial role that is not visible either in terms of added value or employment within the central framework of national accounting. ESPON HERITAGE's proposal for estimating the value derived from volunteer work is based on the number of hours dedicated to these activities and some salary reference, which can be the minimum wage of each country (if a minimum estimate is sought).

This procedure, which is also considered, along with others, in EUIPO, faces the difficulty that there are few sources reporting the total hours dedicated by volunteers to the various activities related to the development and dissemination of MCH. In ESPON HERITAGE, these limitations lead to estimates being made only for the work of volunteers in museums, which clearly undervalues the activities carried out by volunteers in the sector as a whole.

Overall, within HERMES, the following assumptions are considered particularly relevant to support the specific contribution of volunteering:

- Two types of volunteering should be differentiated: the traditional one related to the work linked to cultural associations or networks and individual participation; and the specific contribution of volunteer work through digital platforms (such as Wikipedia or YouTube, as prime examples of how volunteer work can produce valuable digital services heavily relying on volunteer contributions) (EUIPO, 2019). The latter, showcases how volunteers can create significant public goods and services, contributing to the overall value of the digital economy as well as to the creative industries.
- As mentioned earlier, EUIPO recommends to accurately measuring the output of volunteer work, to include the contributions in Cultural Satellite Accounts (CISA) to reflect their true economic value. For this purpose, EUIPO describes, in a very general manner, several approaches that could be adopted in the estimation procedures such as the 'replacement cost' approach which involves calculating the cost of hiring someone to perform the work that volunteers do for free, thereby providing a monetary value to their contributions (EUIPO, 2019).

### Table 19: Data sources useful for volunteer activities calculation

| Name | Link | Description |
|---|---|---|
| Country reports on Volunteering derived from GHK's report | Studies - European Commission | As an example, in SPAIN the value of volunteering work in 2004 as a share of GDP was between 6.9% and 10% (according to the *Plan Estatal del Voluntariado 2005-2009*)[29]. |

[29] Study on Volunteering in the European Union. Country Report Spain. national_report_es_en.pdf

| Name | Link | Description |
|---|---|---|
| National Satellite Accounts | - | An important step towards quantifying the economic value of volunteering was initiated by the United Nations Statistics Division in 2003. They called for countries to produce regular 'satellite accounts' on non-profit institutions and volunteering as part of their national accounting systems. This initiative has led to 32 countries committing to such accounts, with ten already implementing them. |

### 6.2.9 Tourism

As discussed in Chapter 5.5, the output of tourism industries can be estimated by applying an MCH-linked tourism estimator to the output value of each industry. This output, detailed by IOF branches, can be obtained from the TSA in regions that have one. In other regions, estimates can be based on visitor numbers, average stay value, or visitor expenditure. Once a tourism baseline is calculated, a specific scale to determine the proportion of tourism that can be considered heritage-led tourism is applied. The following recommendations are provided for both steps applications.

#### 6.2.9.1 Tourism baseline

All revised frameworks and reports emphasize the significant role of MCH in tourism. MCH is not only a crucial sector for generating tourism revenue, but it also plays a vital part in job creation. Traditionally, the economic impact of cultural heritage has been measured through tourism, as it provides a tangible way to assess the benefits (Charter project, 2021). MCH helps in promoting cultural identity and preserving heritage, allowing tourists to connect with the history and traditions of a place. This connection enhances the overall travel experience, making it more meaningful and enriching for visitors (Borowiecki et al., 2024). The relationship between MCH and tourism is cyclical. Individuals who appreciate and promote cultural heritage often benefit from it as tourists. This interconnectedness suggests that the appreciation and consumption of cultural heritage can lead to a sustainable tourism model that supports the preservation of cultural heritage and benefits the communities involved (Charter project, 2021). On the other hand, ESPON HERITAGE relates the significance of MCH in influencing tourists' decisions to visit specific destinations. It is often regarded as one of the most important resources for international tourism, with cultural heritage being the primary reason for travel for about 30% of tourists (ESPON HERITAGE, 2019). However, accurately isolating the impact of MCH on tourism is complex. Existing data collection methods often fail to distinguish between different types of tourism, such as business versus leisure, and do not adequately capture the nuances of cultural tourism. This makes difficult to assess the full extent of MCH consumption by tourists. In this sense, to better understand the relationship between tourism and MCH, ESPON HERITAGE suggested creating a unique definition of tourists who travel specifically to consume MCH. This could involve identifying specific activities related to MCH and surveying tourists about their engagement in these activities. In this regard, the use of big data, such as reviews and ratings from platforms like Tripadvisor, provides valuable insights into tourist behaviour and preferences regarding MCH (Borowiecki et al., 2024).

Concerning estimation, the economic impact analysis developed by ESPON HERITAGE shows that a substantial portion of tourist spending can be attributed to MCH. For instance, it is estimated that EUR 47,510.8 million was spent on accommodation, food, and beverages by leisure tourists in certain regions, with MCH accounting for approximately 28% of the total sector turnover. Nevertheless, the project assures that despite the recognition of MCH's economic impact, current data quality issues hinder comprehensive economic assessments. Factors such as national economic trends and interactions with other sectors complicate the evaluation of MCH's additionality. In this sense, its final reports conclude that there is a need for improved data collection methods and definitions to facilitate a more accurate understanding of MCH's role in tourism. This includes tracking specific heritage-related expenses and utilizing technology, such as mobile data, to gather insights into tourist behaviour and spending patterns (ESPON HERITAGE, 2019). The sources and steps in their estimation, as described, are as follows: firstly, the estimation of the expenditure of holiday tourists on accommodation and food and

beverages is calculated; secondly, the previous estimation is used to isolate the share of turnover (and GVA) from the relevant sectors (identified NACE branches) that can be related to the MCH; and finally, these data are compared with other data that can be obtained from specific national sources (in Norway, Sweden, Brussels and Flanders) and substantial differences are found from the data obtained from Eurostat (with very different definitions and procedures).

Built upon such challenging efforts, HERMES proposes to estimate the tourism activity generated by the presence of the MCH in the following industries:

- *Accommodation for visitors*
- *Food- and beverage-serving activities*
- *Railway passenger transport*
- *Road passenger transport*
- *Water passenger transport*
- *Air passenger transport*
- *Transport equipment rental*
- *Travel agencies and other reservation services activities*
- *Cultural activities*

These nine tourism industries almost exactly replicate those proposed in the TSA methodology (UN et al., 2010) as characteristic tourism industries. Limiting tourism activity to these nine industries represents a significant practical advantage. By defining tourism industries in this way, it becomes possible to use information from national TSAs, which facilitates operations in HERMES SA. TSAs are available in at least 23 European Union countries, 3 EFTA countries, and one EU candidate country (EUROSTAT, 2023). There are also regions in Europe that have developed their own TSAs according to the same criteria and methods.

Identification of the basic macro-magnitudes (output, GVA, and employment) in the aforementioned nine tourism industries. In territories with TSAs, this step is immediate. In others, the estimates can be based on national statistics on the number of tourists (travellers), the average stay, or, where available, on tourist expenditure, both foreign (inbound tourism) and domestic (domestic tourism) on the tourism services produced by resident units. While the information that EUROSTAT collects under the designation 'demand side of tourism statistics' provides valuable insights into the expenditure of residents both domestically and abroad (outbound tourism), it may be more effective to use other data sources for estimating the expenditure on tourism services produced within the country and for understanding the internal composition of tourism expenditure in a specific country.

#### 6.2.9.2 Density scale to discriminate Heritage Tourism

Estimated the volume that tourism represents, it is crucial to estimate how much of that tourism is due to MCH. In this regard, ESPON HERITAGE proposed addressing tourism whose purpose is leisure as a way to discriminate the weight of heritage tourism (ESPON HERITAGE, 2019). However, leisure tourism includes, among others, beach tourism, which in some regions represent a very high share.

To tackle the challenge of estimating or measuring how much of a region's tourism can be considered related to MCH, the creation of a heritage density scale is proposed to assign a different percentage based on the existing heritage density in the territory. Several steps are proposed for this:

1. **Establish a categorization of heritage levels** for the country and **assign a relative weight** to each level based on its protection level or tourist attraction potential. A simplified example of a categorization table is provided below. To refine the categorization, some weighting factors can be considered, such as the surface area of the asset, to distinguish cultural landscapes, world heritage sites, or buildings that may have a greater capacity to attract tourists than others. Due to the challenges of georeferencing collections and potential biases, it is recommended to exclude movable assets from this classification. Instead, the focus will be on the museums where these assets are exhibited.

**Table 20: Categorization based on heritage levels.**

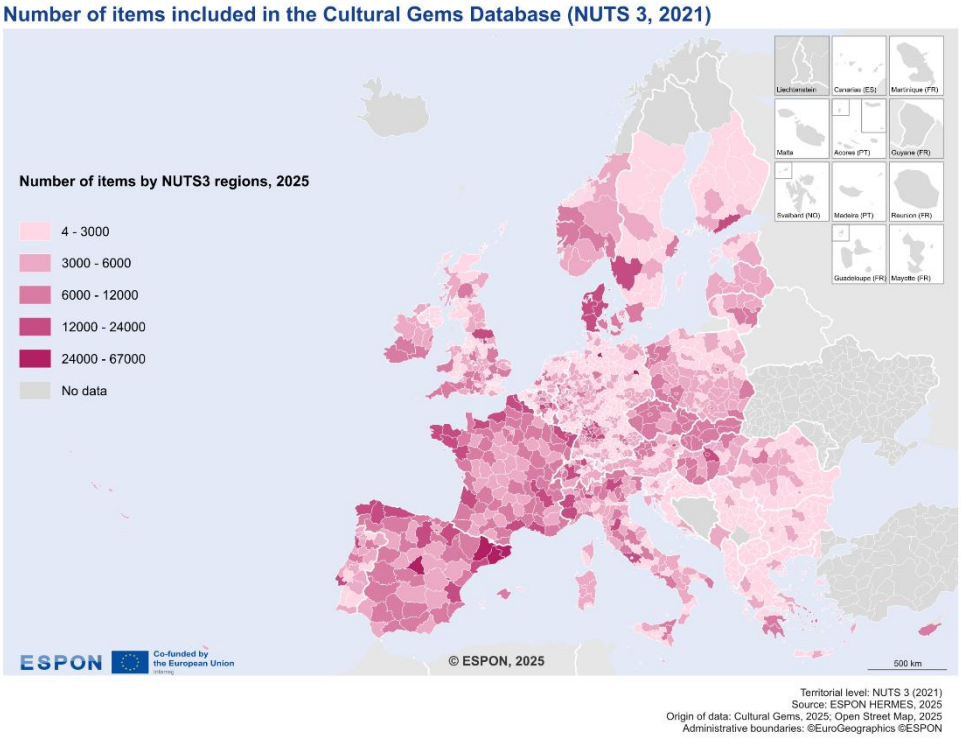
| *Level of heritage* | *Weight* |
|---|---|
| *Listed World Heritage* | *10* |
| *Listed National Heritage* | *8* |

| *Level of heritage* | *Weight* |
|---|---|
| *Listed Regional Heritage* | *6* |
| *Listed Local Heritage* | *4* |
| *Non listed heritage but significant for other reasons (identity,…)* | *2* |

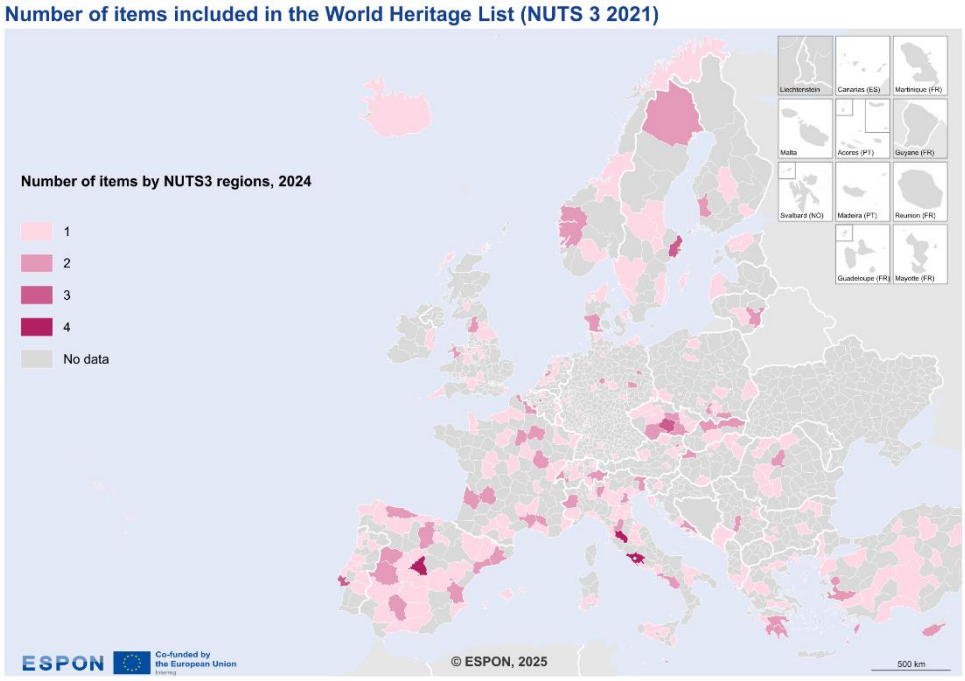
2. To capture the greatest possible variability, the **number of elements by type will be counted** for the greatest possible disaggregation at the national level (if the elements are georeferenced, the application could be carried out at the municipal level). Subsequently, the **weight assigned by type of heritage is applied**, generating a value for each territorial unit analysed (municipality, region...).
3. **A distribution scale** relative to the country in which the satellite account is applied **will be established** based on the values obtained for the different municipalities (minimum, maximum, average, and standard deviation), considering the maximum as 100% of the tourism associated with MCH and the minimum as the minimum considered or established by the country (depending on the country and the minimum density it has, there may be cases where the minimum equals 0% of tourism due to MCH or others whose base is higher).
4. The scale will be applied to the chosen territorial unit for analysis, and this will be the basis for calculating heritage-led tourism.

As potential sources for creating this scale at the European level, Cultural Gems, the World Heritage list, and Census have been explored. The following maps (Map 2, Map 3 and Map 4) shows indicators from these three sources, calculated per NUTS3. Based on the count of Cultural Gems, Madrid (Spain) emerges as the region with the most cultural gems in Europe. Similarly, when considering the number of World Heritage Sites (both cultural and mixed), Madrid is again one of the regions with the highest concentration, alongside with some Italian regions. In contrast, the percentage of dwellings built before 1946 is highest in various regions of the UK, Belgium, Germany, and others.

## Map 2: Number of items included in Cultural Gems

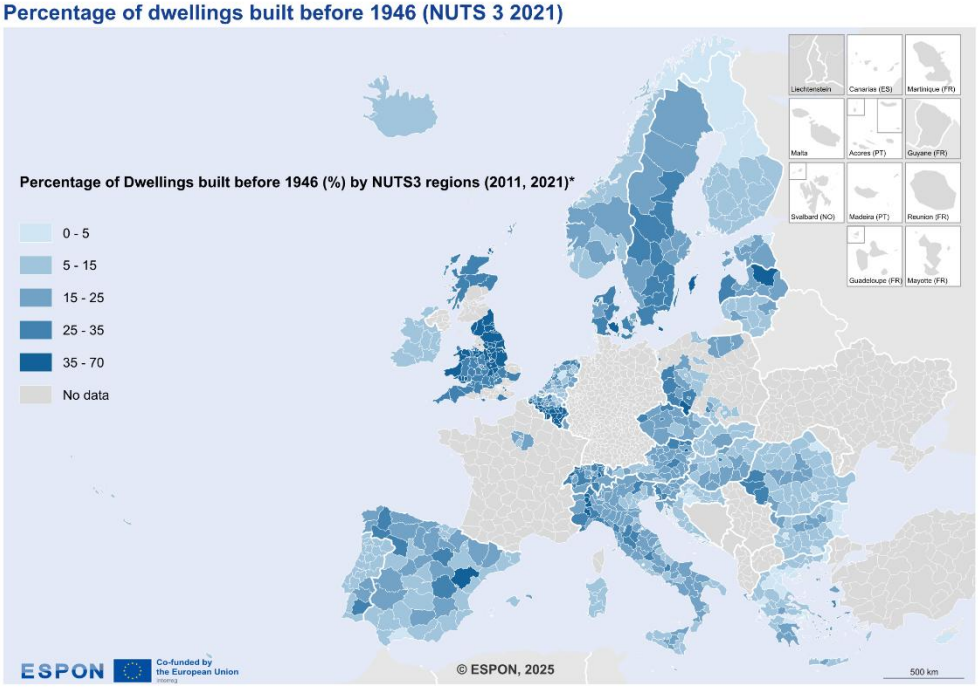


## Map 3: Number of items included in the World Heritage List




Territorial level: NUTS 3 (2021)
Source: ESPON HERMES, 2025
Origin of data: UNESCO, 2025
Administrative boundaries: ©EuroGeographics ©ESPON

## Map 4: Percentage of dwellings built before 1946.




* The map is built using the most recent data available in CensusHub, between 2011 and 2021

Territorial level: NUTS 3 (2021)
Source: ESPON HERMES, 2025
Origin of data: EUROSTAT, 2025
Administrative boundaries: ©EuroGeographics ©ESPON

The exploration of these sources has helped identify weaknesses and opportunities in each, which could serve to move forward in the development of a common European material cultural heritage density scale.

Regarding **Cultural Gems**, several considerations have been identified that could facilitate its potential use:

- The source is based on collaborative OpenStreetMap (OSM) contributions, which are not territorially homogeneous. Some territories have more information than others, with the Madrid region (Spain) hosting the highest density of elements among all the NUTS3 analysed. Currently some control procedures exist to validate the quality and completeness of OSM data sources among regions. Those quality procedures could be explored and adapted for Cultural Gems to identify those countries or regions that may require additional sources to complement the data.
- The same element (point) sometimes presents different labels, making challenging its homogeneous categorization. Specific criteria need to be established to address this issue when accounting or weighing different elements.
- Information imbalances can result in cases where numerous small outdoor statues in parks are georeferenced, generating a high point density that can bias the weighting. Specific quality control measures could be implemented during information processing to detect high points density in small areas, analyse its composition and potential correlation with other sources. This could serve to discard or reduce redundant points or to adjust the weighting of specific categories.
- While many labels are used to categorize elements, most are concentrated in a few categories. Assigning weights to all labels without understanding their distribution could lead to biased results. Once the distribution of elements is analysed, it may be convenient to group labels or eliminate categories that bias the result.

Regarding the World Heritage list, it is relevant to mention that only the point layer of this list is available today and not its delimitation, which can bias the assignment of a site to one region or another. However, the area of each site is available, which could be used to weight the relative importance of each one. Nevertheless, there are ongoing efforts to georeference WHS polygons, which are expected to be available in the near future.

Regarding the Census data, it is worth noting that the information at the NUTS3 level is not comprehensive for all countries. However, other databases, such as Cadastres, could be explored to fill in the gaps in missing information.

As for using building stock per age, it is considered a complementary and interesting source. Nevertheless, if we consider the percentage of buildings constructed before 1946 over the total stock, we may penalize areas that have experienced significant real estate development, despite having a high percentage of heritage buildings. An alternative approach could be to distribute the national pre-1946 building stock among regions.

Apart from the three main sources analysed, some other key sources have been identified that could serve to complement a future common European MCH stock density scale as: Wikipedia lists of monuments by country, Religiana database of religious heritage, European route for industrial heritage, Overture maps, etc. These sources would need to be explored to validate its possible use and processing needs. Additionally agricultural landscape (defined in Agricultural landscape section) could also be considered for the MCH density scale elaboration.

### Table 21: Data sources useful for heritage density calculation

| Name | Link | Description |
|---|---|---|
| Cultural gems | https://cultural-gems.jrc.ec.europa.eu/map | Cultural gems is a free and open source web application, conceived by the European Commission's Joint Research Centre, to map cultural and creative places in Europe. |
| World Heritage List | https://whc.unesco.org/en/syndication | World heritage list georeferenced. |

| Name | Link | Description |
|---|---|---|
| Wikipedia lists of monuments | https://www.wikilovesmonuments.org/ | Lists of monuments by country. |
| Religiana database | https://religiana.com/ | Religious heritage georeferenced. |
| European route for industrial heritage | https://www.erih.net/i-want-to-go-there | Industrial heritage georeferenced. |
| Overture maps | https://overturemaps.org/ | Open collaborative source combining OpenStreetMap with other databases or information sources. |

### 6.2.10 MCH associated education.

Considering that MCH includes movable, immovable, and landscape heritage, education related to MCH cannot be limited solely to cultural education. Immovable heritage requires specific activities in the fields of engineering and architecture for its conservation, maintenance, and rehabilitation. In the case of movable heritage, for example, there are collections formed by natural objects related to both flora and fauna, which require specific conservation and/or analysis procedures. Regarding landscape, its study and maintenance involve disciplines such as geography or environmental sciences. All of this would be in addition to the classical fields more commonly linked to cultural heritage, such as History, Art History, advanced studies in museology, etc.

National statistics on educational expenditure (including the Satellite Accounts of Education where available) do not provide a solid basis for the estimates required in HERMES SA. The classifications on which they are based (International Standard Classification of Education (ISCED), or their national variants) do not adequately define the types of educational activities relevant to HERMES SA. ISCED is particularly concerned with classifying educational programs and degrees from the perspective of the educational level achieved. ISCED also addresses the classification of educational fields, but this classification is rarely used in statistics related to the expenditure and financing of educational activities.

The SBS or national economic statistics related to the service sector cannot solve the problem either. These sources provide information classified according to NACE, but in NACE, the specific class for 'cultural education' (85.52 in NACE Rev. 2.1) only includes vocational training. The bulk of educational activities in NACE are found in groups 85.1 to 85.4, where the classification criterion is the educational level (not the specialty), and therefore, cultural education cannot be distinguished from education with any other purpose.

The only possible solution is to resort to national statistics specific to the education sector, which provide information, among other things, on enrolled students, and use these data to estimate the portion of educational activity dedicated to educational modalities associated with the MCH. In the Satellite Account of Culture of Spain (MINISTERIO DE CULTURA Y DEPORTE, 2024), for example, a similar scheme has been adopted based on the identification of a series of educational modalities associated with the cultural sector and the use of the percentage of students enrolled in these modalities.

Nevertheless, estimation in this sector is challenging. Limited literature exists on the accounting of Material Cultural Heritage education, and mainly related to cultural studies (Charter project, 2023; ESPON HERITAGE, 2019). Given the difficulties described, HERMES recommends analysing curricula, particularly in higher education, to identify those degrees most directly associated with the identification, preservation, and management of MCH, and using the number of students in these programs to estimate their weight in the output and gross valued added of educational activities.

### 6.2.11 MCH associated research (including archaeological excavations)

The estimation of research activity in the field of MCH is complicated by the fact that MCH does not constitute a specific area. Researchers from a wide range of specialties, including natural sciences, engineering, social sciences, and humanities, can conduct relevant research in MCH. In fact, it is possible to find small research groups within engineering branches or other formations specialized in MCH, as well as larger research groups linked to major research organizations dedicated to research related to MCH.

Consequently, it is not possible to identify a coefficient that reasonably and adequately expresses the weight of activities related to MCH within the NACE classes *'72.10 Research and experimental development on natural sciences and engineering*' and *'72.20 Research and experimental development on social sciences and humanities*.'

Due to these difficulties, HERMES suggests seeking other procedures based on national sources of information that, while incomplete, are reproducible and could provide an approximation of the weight of MCH in the academic field. These may include the number of academics in specialties most directly associated with MCH, or the number of students enrolled in specialties directly related to the activities of the sector.

### 6.2.12 Non-market general administration services by Public Administration

This *key industry* encompasses all public administration activities related to the promotion and regulation of activities associated with MCH. The responsibility for these activities usually falls on the ministries of national governments or the equivalent units of regional and local governments.

These activities have a distinctly general nature and are separate from the administrative tasks carried out within the organizational units responsible for managing museums, archaeological sites, or other types of public institutions that carry out activities located in the rest of the *key industries*. General administration services are understood to be linked to all phases of the MCH value cycle, which they tend to promote and regulate. However, general administration activities related, for example, to the promotion or regulation of tourism or, by extension, other activities not directly related to MCH, are not considered in this *key industry*.

Within the IO framework, the activities that are part of this key industry are located in the branch '*Public administration and defence; compulsory social security*'.

Given the difficulty of establishing a coefficient for estimating the part of this branch specifically linked to the general management, regulation, and promotion of MCH, the solution recommended by HERMES for accounting the production of this key industry is based on a thorough analysis of public accounting in each country/region.

This approach requires a comprehensive review of the expenditure programs in the settlements of the relevant public administration budgets. In public budgets, it is common for the program names to refer, when appropriate, to the general nature of administrative activities, which facilitates the selection of certain expenditure programs. Similarly, attention should be focused on the expenditure programs of ministries (or equivalent units) with competencies in culture. Once the expenditure associated with the general public administration of the cultural sector is isolated, estimating the part attributable to MCH management would require calculating or estimating the weight of governmental activities in the MCH field in relation to the total cultural expenditure in the budget. In this task, the names and descriptions of the expenditure programs in public budgets can once again be useful.

The valuation of the production associated with these activities should be adapted, as in the rest of this methodology, to the ESA 2010 criteria. Specifically, the valuation of non-market production output follows the cost criterion, which includes intermediate consumption, compensation of employees, consumption of fixed capital, and other taxes on production less other subsidies on production (EUROSTAT & EC, 2013, p. 61).

# 7 Conclusions and future research opportunities

Throughout the development of this methodology, we engaged in discussion sessions and reviews with experts from 14 different organizations related to statistical production and heritage management. This collaborative process aimed to gather diverse perspectives and insights, identify gaps and potential future lines of implementation, fostering collaborative relationships. Two consultation meetings were organized, one for a preliminary methodological approach and another for the validation of the fully developed HERMES SA methodology. Experts emphasized the importance of some aspects in relation to information on the European and national material cultural heritage stock, common databases and efforts needed to improve information on the sector, and the possible application and testing of the proposed methodology. Below, some general aspects derived from the stakeholders' interest and experience are presented, which we believe open up future research opportunities in the field.

## 7.1 Implementation recommendations and considerations

One of the concerns raised during the consultation process was its potential application at the European level, utilizing common sources across countries. From its inception, the HERMES initiative aimed to provide a methodology that could be applied at the European level, leveraging EU-level data sources (via Eurostat for the application of Coefficient 1 and other complementary sources for the application of Coefficient 2 in different key industries). The foundations of the methodology are considered viable for such an application, but some necessary recommendations for its testing and consolidation are noted.

### 7.1.1 European MCH stock database

A global application of this methodology and its comparability between different countries necessitate a robust database on the stock of Material Cultural Heritage (MCH) and a comparable index of MCH density at the regional level. This would not only facilitate the application of the account in countries with economic barriers but also enable its adoption in various countries using homogeneous criteria.

Some insights into the stock of material heritage are provided in section 5.4.2, while methodological suggestions for the heritage density scale are outlined in section 6.2.9. Both sections reference European sources that can facilitate this application, with section 6.2.9 offering reflections on the weaknesses and opportunities presented by some of these sources (Cultural Gems, Census, and World Heritage List). This section also defines criteria for overcoming these weaknesses.

However, given the current lack of information and the challenges posed by existing sources at the European level, significant effort is required to develop a comprehensive accounting of the MCH stock at the European level and a density scale that accurately weights the various elements to be considered.

### 7.1.2 Stakeholder continuous validation

The validation experience with stakeholders during the development of this methodology has been very enriching, especially because it involved stakeholders with two very different but complementary profiles from the regional, national and European levels: experts in statistical production and experts in MCH. The combination of both profiles has allowed the methodology to be validated both from the requirements that a satellite account must meet and from the sector's considerations.

It is proposed as a good practice to maintain validation with stakeholders of both profiles in the next steps of applying this methodology, where it is crucial to have knowledge of statistical production for the preparation of results, but it is also essential to provide criteria from the MCH field to the estimation criteria linked to Coefficient 2 defined in section 6.2.

### 7.1.3 First testing application

Before a global implementation of HERMES SA, a pilot application in a series of countries or regions with diverse contexts is recommended. This pilot will enable the validation of the proposed methodology and allow for the

refinement of certain estimation procedures for Coefficient 2, as outlined in section 6.2. By applying the methodology in various territories, it will be possible to assess the effectiveness of the approach and inform decision-making regarding the sources and criteria to be used at the European level, taking into account the unique characteristics and differences between the analysed territories.

## 7.2 Data quality and availability

The bibliography analysed highlights the difficulties in classifying and accounting for the MCH sector in detail. Compared to previous studies, HERMES has worked with the new version of the NACE Rev.2.1 classification, in which Eurostat has already made significant progress in disaggregating activities related to the culture and heritage sector. The progress and willingness to improve these types of sources are noteworthy. Despite this, many of the key industries require complementary sources to establish reliable proxies or estimation methods, particularly for Coefficient 2 estimations. These methods are mostly not based on economic variables, such as area variables, number of elements, number of students, etc. and, to address the limitations of data availability, offer alternative solutions in the absence of more robust data.

While some of these solutions have been successfully adapted at the national or regional level, others have proven more challenging. For some of the estimations, it has been impossible to find a homogeneous source at the European level, and explorative paths have been offered at the national/regional level based on their resources. For other activities (those identified but marked as discarded in section 4), it has not been possible to offer even this type of explorative path, considering that it is extremely difficult to distinguish their contribution to the MCH. However, they have been noted for their relationship with the MCH sector, leaving open the possibility for future estimation or accounting methods to be developed.

## 7.3 Context specificities

In the field of culture and heritage, significant differences exist between countries regarding the importance and even what is considered part of the cultural or heritage stock, which is contingent on the specific context. UNESCO acknowledges these variations and offers a general framework for culture that allows for flexible definitions adaptable to each unique context. Similarly, the literature review performed and the stakeholders' contributions, reveal that differences also exist in professions related to MCH and in the classification of economic activities within key industries, despite the use of common classifications.

HERMES aims to provide a global solution for MCH accounting and considers that a pilot application in multiple countries with diverse contexts can help establish a standardized methodology that serves the majority. However, we recognize that certain countries or regions may have specific particularities that can only be addressed through national or regional applications carried out by experts with in-depth knowledge of the local context.

## 7.4 The opportunity of georeferencing

Through the development of this methodology, various valuable sources have been identified for quantifying the MCH stock and/or the development of estimation procedures for key industries. However, many of these sources, such as the Globally Important Agricultural Heritage Systems -GIAHS- or the Protected Designations of Origin -PDO, are not currently geo-referenced. Some sources provide point maps indicating generic locations (not necessarily available for download), and do not offer specific geographic delimitations, making it difficult to accurately assign them to corresponding regions. This limitation hinders analysis of these sources in relation to other variables, as it has been done in section 6.2.2 with agricultural area. In this regard, UNESCO is currently making progress in defining the delimitation areas of the World Heritage Sites. This information includes the delimitation of the protected area and its buffer zone, a development which holds promise for improving the georeferencing of MCH-related data.

There are other sources like Cultural Gems, which, as already seen, have information from around the world, but since they are user-generated, they are not territorially homogeneous and present specific processing and validation needs for its use. Despite these challenges, Cultural Gems is considered a valuable resource worthy of consideration.

There are also sources that collect or list elements (for example: Europeana, or the lists of monuments created by Wikipedia) that are considered extremely interesting, but due to the lack of georeferencing, their use and assignment to specific territories, beyond the country, is difficult. Sometimes they do not even allow downloading a list with complete information, which would also make national-level assignment difficult.

There are also online maps created at the European level for specific thematic heritage elements (such as religious heritage, industrial heritage, or cultural routes, among others), which, although visualized on a map through different websites, do not seem available for download and processing. It would be interesting to encourage these initiatives to offer data openly to check their quality, completeness, and redundancy with other sources. Once these aspects are verified, they can be key sources to complete the stock of material heritage.

Additionally, due to the lack of a single georeferenced information source of protected buildings for each country or territory, it is proposed to use buildings prior to 1946 as a proxy. This information has been found to be unavailable in the 2021 Census for all countries at the NUTS3 scale, but other complementary sources such as cadastres are known, which could complement this information or even serve to generate a more detailed building-by-building database. However, this requires considerable processing and harmonization of existing sources.

All these cases present a complex scenario of sources with different levels of availability, access, and quality. However, there is a latent opportunity in processing and integrating all of them to have a complete picture of what material heritage represents in different territories, allowing geolocation down to the NUTS3 scale, detecting redundancies between sources, and analysing the relationship of MCH with other layers of information.

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# Annex 1 – Stakeholders' consultation meetings

The HERMES SA methodology development was complemented by two online stakeholders' consultation meetings, aiming to gather different perspectives and collaborative inputs from relevant stakeholders, both from the cultural heritage and the statistics fields.

The two consultation meetings aimed to gather feedback on the preliminary methodological approach (21 November 2024) and validate the fully developed HERMES SA methodology (17 December 2024).

These meetings facilitated a fruitful debate and provided valuable insights, leading to improvements in the conceptual framework, methodological approach, and final report structure. Key discussion points were focused on the delimitation of the material cultural heritage sector and its economic activities, the concept of digital heritage, governance, management, education, and volunteering functions, estimation methods and data sources at European level, National databases on heritage listings and complementary data sources for heritage items and density.

18 stakeholders from 14 institutions participated in the first consultation event and 15 stakeholders from 10 institutions attended the second event. Draft reports were shared in advance to facilitate productive discussions, and additional feedback was collected in written form from stakeholders unable to attend the meetings.

The agendas for the two stakeholder consultation events are attached below:

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# // HERMES Research Project consultation meeting, 21/11/2024

## Preliminary stakeholders' consultation meeting

Venue: Online via MsTeams: Link to meeting

### // Context and objectives

The HERMES project aims to develop a methodological framework for the **Material Cultural Heritage Satellite Account**. In this meeting, the conceptual framework for the satellite account will be presented, based on the review of existing frameworks and practices. Additionally, the draft methodology used for the delineation of the sector and the identification of its characteristic industries and connected products will be outlined. In order to receive an expert validation on the conceptual framework, particularly concerning the model robustness (the material cultural heritage sector understanding and its relation with economic activities' classification), this workshop seeks to gather valuable feedback from stakeholders to ensure the framework's uptake and its applicability to different contexts.

### // Agenda

| | | |
|---|---|---|
| **10:00–10:10** | **Welcome and introductions** | |
| | Welcome by ESPON Research and Policy Manager and Project coordinator | Zintis Hermansons (ESPON EGTC)<br>Alessandra Gandini (Tecnalia) |
| **10:10–10:20** | **HERMES Project: overall overview and structure** | |
| 10:10–10:15 | Overall presentation of the HERMES project | Alessandra Gandini |
| 10:15-10:20 | Introduction to the consultation process: involvement, expected contributions, next steps and expected return | Alessandra Gandini |
| **10:20– 10:45** | **Draft methodology of the material cultural heritage satellite account** | |
| 10:20-10:30 | Overview of past and current practices | Alessandra Gandini |
| 10:30-10:45 | Definition of the material cultural heritage sector approach | Amaia Sopelana (Tecnalia) |
| **10:45-11:20** | **Open discussion** | |
| | Discussion on the partial results presented: model robustness and sector understanding | All participants<br>Moderator: Igone Revilla (Tecnalia) |
| **11:20-11:30** | **Satellite account methodological approach** | |
| | Presentation of the preliminary approach | Elena Usobiaga (Tecnalia) |
| **11:30-11:50** | **Open discussion** | |
| | Feedback on the proposed approach | All participants<br>Moderator: Igone Revilla |
| **11:50-12:00** | **Wrap-up and main conclusions** | |
| | Summary of main key messages received and next steps | Amaia Sopelana |

// All hours indicated in the programme are in CET
//Please contact Alessandra Gandini at alessandra.gandini@tecnalia.com if you have any questions.

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# // HERMES Research Project consultation meeting, 17/12/2024

## Final stakeholders' consultation meeting

Venue: Online via MsTeams: Link to meeting

### // Context and objectives

The HERMES project aims to develop a methodological framework for the **Material Cultural Heritage Satellite Account**. This meeting will focus on presenting the proposed framework, with an emphasis on the objectives pursued by the satellite account, the definition of indicators, and the proposed estimation methods. Building on the feedback received during the previous consultancy, this session aims to validate the proposed methodology and brainstorm innovative approaches to enhance methodology and data sources. To ensure a productive discussion, participants are encouraged to review the advance content document shared prior to the meeting.

### // Agenda

| | | |
|---|---|---|
| **09:30–09:40** | **Welcome and introductions** | |
| Welcome by ESPON Research and Policy Manager and Project coordinator. Presentation of the agena | | Zintis Hermansons (ESPON EGTC)<br>Alessandra Gandini (Tecnalia) |
| **09:40–09:55** | **Recap of previous work and feedback received** | |
| 09:40-09:45 | Key aspects covered in previous document | Alessandra Gandini |
| 09:45-09:55 | Overview of changes implemented based on feedback | Alessandra Gandini |
| **09:55-10:15** | **Delimitation of the sector** | |
| Final proposal for the delimitation of the material cultural heritage sector + Q&A (5min) | | Amaia Sopelana (Tecnalia) |
| **10:15-10:35** | **Satellite Account proposal** | |
| Structure and objectives+ Q&A (5min) | | Elena Usobiaga (Tecnalia) |
| **10:35-10:55** | **Estimation methods** | |
| Presentation of proposed estimation methods+ Q&A (5min) | | Alessandra Gandini |
| **10:55-11:10** | **Coffee break** | |
| **11:10-11:30** | **Collaborative discussion: Cultural Landscapes and Waterscapes** | |
| Incorporating cultural landscapes and waterscapes into HERMES SA methodology | | Intro: Alessandra Gandini<br>Moderator: Igone Revilla |
| **11:30-11:50** | **Interactive Exercise: New Data Sources** | |
| Exploring challenges and opportunities of integrating new data sources: the concept of heritage density for tourism. | | Intro: Elena Usobiaga<br>Moderator: Igone Revilla |
| **11:50-12:20** | **Open discussion** | |
| Feedback on the proposed methodology | | All participants<br>Moderator: Igone Revilla |
| **12:20-12:30** | **Next steps and closing remarks** | |
| Additional comment submission process and timeline. Summary of key points discussed. Closure of event | | Alessandra Gandini, Zintis Hermansons |

// All hours indicated in the programme are in CET
//Please contact Alessandra Gandini at alessandra.gandini@tecnalia.com if you have any questions.

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# Annex 2 – Example of calculating coefficients 1 and 2 for the key industry '*Real estate of historic dwellings*'

**Disclaimer**: Since this entire report uses the NACE rev.2.1 classification, but the currently accessible data corresponds to NACE rev.2, an example is proposed considering a key industry whose associated NACE classes have not undergone significant changes between the two versions of NACE.

The calculation method for the production (output) of the key industry '*Real estate of historic dwellings*', which in Table 5 is identified as one of those that shape the MCH sector, is described below. The estimate is made for the value of the production of the key industry in Spain during 2021.

In general, key industries are located in a single IO branch. However, and as an exception, '*Real estate of historic dwellings*' encompasses two types of activities included in two different branches of the IO supply table, namely '*Imputed rents of owner-occupied dwellings*' and '*Real estate activities excluding imputed rents*'. As a result, the procedure outlined below is applied to the sum of the value of production in both branches.

To facilitate the follow-up of the example,

Table 22 provides a detailed view of Table 5 related to the selected key industry. The table provides information on the NACE classes where the establishments that form part of this key industry are located. The identifier 'partial', which affects all NACE classes associated with the key industry, indicates that only a part of the activities contemplated in these NACE classes form part of the key industry, which requires the use of two coefficients (as explained in Section 5.5). Finally,

Table 22 shows the IO branches where the NACE classes associated with the selected key industry are integrated and the set of NACE classes included in these branches.

**Table 22: Detail of Table 5 (see section 5.3) related to the key industry 'Real estate of historic dwellings'**

| Key industries | Economic activities (NACE Rev. 2.1) | Activity weight | Input- Output branch(es) | NACE activ. Included in branches |
|---|---|---|---|---|
| Real estate of historic dwellings | - | Partial | Imputed rents of owner-occupied dwellings. | - |
| | 68.20 Rental and operating of own or leased real estate | Partial | Real estate activities excluding imputed rents. | M |
| | 68.31 Intermediation service activities for real estate activities | Partial | | |
| | 68.32 Other real estate activities on a fee or contract basis | Partial | | |

The data available for the estimation are as follows:

On the one hand, the supply table of the IO framework shows the following production values for the selected IO branches (see Table 23). The source of this information are the FIGARO input-output tables, published in the EUROSTAT database[30].

**Table 23: Detail of the IO supply table. (Value of) Production (output) of the IO branches '*Imputed rents of owner-occupied dwellings*' and '*Real estate activities excluding imputed rents*', broken down by product. Spain, 2021. Millions of euros. *Source: FIGARO input-output tables, EUROSTAT database*.**

| IO Products | Imputed rents of owner-occupied dwellings | Real estate activities excluding imputed rents |
|---|---|---|
| **Total** | **96,885** | **59,929** |
| **Imputed rents of owner-occupied dwellings** | **96,885** | **0** |
| **Real estate services excluding imputed rents** | **0** | **58,952** |
| **Other products** | **0** | **977** |
| *Food, beverages and tobacco products* | 0 | *52* |
| *Textiles, wearing apparel, leather and related products* | 0 | *3* |
| *Motor vehicles, trailers and semi-trailers* | 0 | *0* |
| *Electricity, gas, steam and air conditioning* | 0 | *32* |
| *Constructions and construction works* | 0 | *16* |
| *Architectural and engineering services; technical testing and analysis services* | 0 | *240* |
| *Scientific research and development services* | 0 | *15* |
| *Advertising and market research services* | 0 | *240* |
| *Rental and leasing services* | 0 | *70* |
| *Other personal services* | 0 | *310* |

On the other hand, information from the Structural Survey of Enterprises: Service Sector[31], carried out by the Spanish National Statistics Institute (Instituto Nacional de Estadística - INE) is available, from which the data published by EUROSTAT in the Structural business statistics (SBS) section are extracted. This source is used to make estimates of the internal structure, by NACE classes, of the value of production (output) in a specific IO branch. In this example, although two IO branches are being worked with, only one of them is in the SBS, '*Real estate activities excluding imputed rents*', and therefore its internal composition is analysed. The other branch, for the purposes of coefficient 1, is taken in its entirety in its production value reflected in the IO framework.

Table 24 shows the composition for the activities included in the branch '*Real estate activities excluding imputed rents*', for the case of Spain 2021.

[30] Database - ESA supply, use and input-output tables - Eurostat

[31] INEbase / Economía /Empresas /Estadística estructural de empresas: sector servicios / Últimos datos

**Table 24: Internal composition by NACE classes of the production (output) in the branch *'Real estate activities excluding imputed rents'*, in section L (M in NACE rev.2.1). Spain, 2021. *Source: INE. Structural Survey of Enterprises: Service Sector.***

| NACE classes | % |
|---|---|
| **68 Real estate activities** | **100.0** |
| 6810 Buying and selling of own real estate | 2.0 |
| 6820 Renting and operating of own or leased real estate | 68.1 |
| 6831 Real estate agencies | 19.8 |
| 6832 Management of real estate on a fee or contract basis | 10.1 |

In this example, all the NACE rev.2 classes, except '6810 Buying and selling of own real estate', are included in the IO branch belonging to the selected key industry. Consequently, the **coefficient 1** (see page 60) is 98% of the branch '*Real estate activities excluding imputed rents'* and 100% for the branch '*Imputed rents of owner-occupied dwellings*'.

For the calculation of **coefficient 2**, information on the percentage of dwellings that were built prior to 1946 in the country is available. In Spain, this percentage is obtained from the Census of Dwellings and Buildings 2021 and reaches a value of 11.85%, according to the data published by the National Institute of Statistics (INE)[32]. According to the proposed methodology (page 74), this percentage can be used as coefficient 2 to estimate the part of the production value produced by establishments in the identified NACE classes that belongs to the MCH sector.

The application of these two coefficients to the data related to the production value (output) in the supply table is shown in the following Table 25.

**Table 25: Procedure for estimating the production value (output) of the key industry "Real estate of historic dwellings" (coefficient 1 and 2). Spain, 2021.**

| | | PHASE 1 | | PAHSE 2 | |
|---|---|---|---|---|---|
| | "Imputed rents of owner-occupied dwellings"<br>"Real estate activities excluding imputed rents" IO branch | Coefficient 1 | Selected NACEs | Coefficient 2 | Key industry |
| **IO Products** | | | | | |
| Total | 156.814 | 99.23% | 156.814 | 11,85% | 18.582 |
| Imputed rents of owner-occupied dwellings | 96.885 | 100% | 96.885 | 11,85% | 11.481 |
| Real estate services excluding imputed rents | 58.952 | 98% | 57.773 | 11,85% | 6.846 |
| Other products | 977,1 | 98% | 958 | 11,85% | 113 |

[32] https://www.ine.es/censos2021/

| | | PHASE 1 | | PAHSE 2 | |
|---|---|---|---|---|---|
| HERMES Products | | | | | |
| Real estate of historic dwellings services | | | | | 18.582 |
| Other non-key products | | | | | 11.481 |

# Annex 3 – Summary table on estimation procedures and sources useful for coefficient 2 calculation

The following table provides an overview of the estimation procedures and example of reference sources for the application of coefficient 2 in those key industries that only account for a portion of a NACE class.

| Key industry | Coefficient 2 estimation procedures | Comments | Example of reference sources |
|---|---|---|---|
| MCH libraries | National and academic libraries / total of libraries | - | IFLA Library Map of the World |
| Agricultural landscape | Protected areas surface / total agricultural areas surface | Requires geoprocessing but a baseline has been already provided as part of this project. | CORINE Land Cover<br>World Database on Protected Areas |
| Waterscape | - | Requires local knowledge and sources to estimate traditional fishery activities | European Marine Observation and Data Network |
| Insurance of historic dwellings | (Real estate insurance / Non-life insurance) * (Dwellings <1946 / Total dwellings) | - | Insurance Europe |
| Rehabilitation of historic buildings (including dwellings) | (Rehabilitation activities / Total construction and/or architectural activities) * (Dwellings <1946 / Total dwellings) | - | European Construction Industry Federation<br>Architects Council of Europe |
| Real estate of historic dwellings | Dwellings <1946 / Total dwellings | - | CensusHub |
| Antiques sale | (Antiques retail / Total second hand or intermediation services for retail) | Requires local sources | Local sources (records of companies dedicated to the sale of antiques) |
| Development and dissemination of MCH material and participatory activities through the work of volunteers | - | Requires adaptation according to available local sources | Local sources (volunteering estimations/ records, list of relevant local MCH sources -for online dissemination accounting-) |

| Key industry | Coefficient 2 estimation procedures | Comments | Example of reference sources |
|---|---|---|---|
| MCH Tourism | Tourism * (MCH density scale) | Requires the creation of a MCH density scale to discriminate the proportion of tourism that could be considered related to MCH. | Tourism Satellite Account<br>Local sources (MCH inventories, catalogues…) or/and Cultural Gems, World Heritage List, Wikipedia lists of monuments, or others. |
| MCH associated education | Students enrolled in MCH programs / Total of students | Requires local educational sources | Local sources (students per education modality and program) |
| MCH associated research (including archaeological excavations) | Students enrolled in MCH programs / Total of students | Requires local educational sources | Local sources (students per education modality and program) |
| Non-market general administration services by Public Administration | Promotion and regulation MCH activities done by governments (excluding museums, libraries and other institutions already considered in other key industries) / total non-market general administration services | Requires a thorough analysis of public accounting in each region or country | Local sources (public accounting information) |

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