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**MuSA**  
museum sector alliance

**W14.2.1A BUILDING A CRITICAL,  
CREATIVE AND INFORMED MUSEUM  
PRACTICE**

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Unit:	Building a critical, creative and informed museum practice
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Abstract:	This unit introduces learners to the meaning and value of analyzing and synthesizing as part of critical and creative thinking in the context of a reflexive and informed museum practice. Furthermore, it provides some guidance and examples.
Keywords:	Analyse and synthesize, creative thinking, critical thinking, evaluation, fact-driven, information management, innovation, interpretation, media and technology, museum professionals, museum, problem solving.





Module: W14.2 – Analyse and synthesize information

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## Aim and objectives

The aim is to introduce learners to the meaning and value of analyzing and synthesizing as part of critical and creative thinking in the context of a reflexive and informed museum practice. Furthermore, it provides some guidance and examples.

## Learning outcomes

After studying this resource, you will be able to: select at least three domains where the ability to analyse and synthesize information is often related; identify the most important outcome of analyzing and synthesizing information; identify three situations in museum work that demand the ability to analyse and synthesize information; list three tools that can be useful when analyzing information; and indicate at least two steps that can help making informed decisions and building your critical and creative museum practice

## Keywords

Analyse and synthesize, creative thinking, critical thinking, evaluation, fact-driven, information management, innovation, interpretation, media and technology, museum professionals, museum, problem solving.

## Contents

1. Introduction .....	6
2. Analyse and synthesize information: an overview .....	9
2.1. What is it about and how can it be useful?.....	9
2.2. To whom it matters?.....	13
3. Building a critical, creative and informed museum practice.....	14
3.1. Developing a 4-step approach.....	15
3.2. Case study: Collaboratively defining a museum mission .....	22
4. Synopsis.....	28
5. List of references .....	28
6. Glossary .....	30
7. Further reading .....	33

## List of figures

All photos by Ana Carvalho

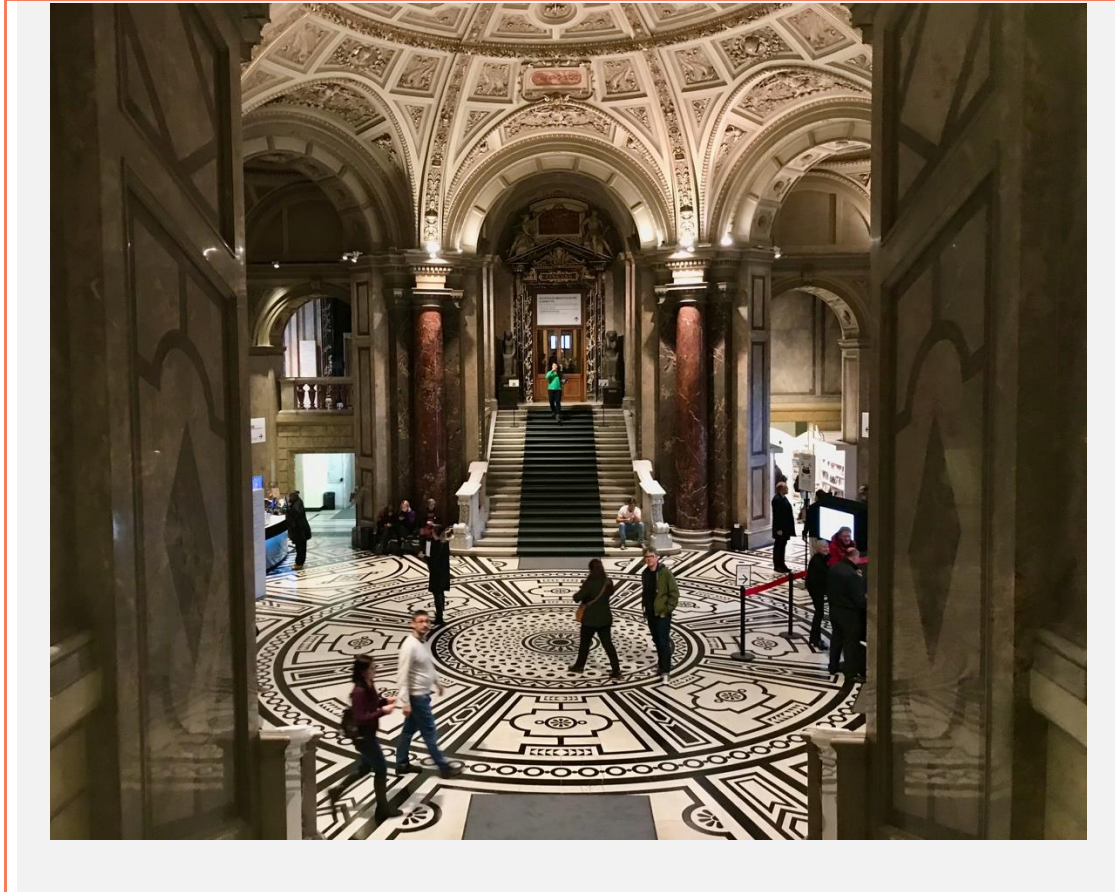
Fig. 1 (p. 6): Kunsthistorisches Museum Wien, entrance hall, Austria, 2019

Fig. 2 (p. 9): Museum of Lisbon, guided tour, Portugal, 2019

Fig. 3 (p. 14): Post-its, 2019

Fig. 4 (p. 26): Cloth created by the Vila Nova de Famalicão Museum Network (VNFMN). Screenshot from the book *Definir a Missão... Da Necessidade ao Desafio/Defining the Mission... From Necessity to Challenge* (2019, p. 58-59).





## 1. Introduction

Generally speaking, **analyse and synthesize information** is the ability to knit together information from disparate resources.

In the framework of project Mu.SA “analyse and synthesize information” was included, from the start, in a list of 20 **transferable competences** (e.g. leadership and change facilitator, team working, communication, time management and creative thinking skills, etc.) that were considered relevant to support museum professionals in their efforts to make museums



thrive in the **digital environment**, along with a combination of specific **digital competences**.<sup>1</sup>

In fact, analyse and synthesize information is a topic frequently mentioned in main reference frameworks related to the “21<sup>st</sup> century skills”, those skills that any person will need to develop in learning and working life.

For example, that is the case of [P21 Framework for 21<sup>st</sup> Century Learning](#) (P21, 2019)<sup>2</sup>. While this framework does not regard “analyse and synthesize information” as a **competence per se**, it mentions it in relation to key domains such as **creativity** and **innovation**, information, media and technology, but foremost with **critical thinking** and **problem solving**. From the latter point of view, several interconnected abilities are stressed: **analyse** how parts of a whole interact with each other; effectively **analyse** and evaluate evidence, arguments, claims and beliefs; **analyse** and evaluate major alternative points of view; **synthesize** and make connections between information and arguments; **interpret** information and draw conclusions based on the best analysis (p. 4), and so on.

Howard Gardner’s book *Five Minds for the Future* (2009) also stresses the importance of a **synthesizing** mind as one of the five main characteristics that need to be cultivated and developed through lifelong learning commitment. Gardner, a north American psychologist<sup>3</sup>, argues that those without synthesising abilities may

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<sup>1</sup> The initial list of transferable competences was drawn up from previous European projects (Silvaggi, 2017, p. 19).

<sup>2</sup> This framework is based in a partnership founded in 2002, USA, from a non-profit coalition sponsored by education, business, and community organizations.

<sup>3</sup> Howard Gardner (1943-) proposed in 1983 the Multiple-Intelligences theory based in “the idea that intelligence is made up of eight distinct categories: linguistic, musical, bodily-kinesthetic, logical-mathematical, spatial, naturalist,



be overwhelmed by information and probably unable to make thoughtful decisions. In this sense, a synthesizing mind relates to the ability of incorporating ideas from different disciplines or domains into a coherent whole and to communicate that to others.

On the other hand, analyse and synthesize information is also relevant when considering the digital challenges of today's society. In a time where there is an increasing number of information available from different sources, and a variety of new tools and media to access that information, there is also a need to better navigate these issues by enhancing digital competences. That includes the "ability to search, collect and process information and use it in a critical and systematic way, assessing relevance [...]", considering also its inputs in supporting critical thinking, creativity and innovation (Recommendation of the European Parliament and of the Council of 18 December 2006 on key competences for lifelong learning, 2006, p. 16).

Some of these topics – guidelines on how to **browse, search and filter data, information and digital content, manage and evaluate** it - were already approached in your MOOC learning journey.

In this module we will argue that the analysing and synthesizing information is embedded in many museum activities and, thus, is a shared concern and an ability that needs to be developed by every museum professional and job profile as part of a critical, creative and informed museum practice.

Gaining awareness about the meaning and relevance of this ability in your professional life is a first step to make informed decisions and build your practice towards museum development.

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intrapersonal, and interpersonal". From APA Dictionary of Psychology: <http://bit.ly/2Z8IHSQ> (accessed 15 December 2019).

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## 2. Analyse and synthesize information: an overview

We will start by discussing what is the ability to analyse and synthesize information as part of a larger process of critical and **creative thinking**. We will also point out its usefulness towards a critical, creative and informed museum practice, and the need to strengthen and improve these abilities by every **museum professional**.

### 2.1. What is it about and how can it be useful?

The ability to analyse and synthesize information is often related to the domain of critical thinking, creative thinking, **innovation**,



managing information, and in many cases is driven from the need of **problem solving** and making informed decisions.

Next, we will briefly approach it from the perspective of critical thinking.

There are many definitions and approaches to **critical thinking**, but generally speaking, it can be understood as a “process of thinking carefully about a subject or idea [...]”<sup>4</sup>. Such process may embed “actively and skillfully conceptualizing, applying, **analyzing**, **synthesizing**, and evaluating information to reach an answer or conclusion” (Rutherford, 2019, n.p.).

From this point of view, analysis and synthesis are interconnected and is an ability that is put in place in a larger process of critical thinking. That may also include several intertwined elements such as:

- Asking questions – a starting point – and a key aspect throughout the process
- Collecting information and selection
- Fact-driven
- Evaluating
- **Analyzing** & Interpreting
- **Synthesizing**
- Making inferences from the information
- Connecting and combining ideas and information
- Considering alternative points of view
- Formulating and generating (new) ideas
- Reaching conclusions

Let us explore the meaning attached to “analysis” and “synthesis” separately. According to the dictionary, **analysis** “is to study or

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<sup>4</sup> From Cambridge Dictionary: <http://bit.ly/2PzIu6K> (accessed 15 December 2019).



examine something in order to discover more about it”.<sup>5</sup> In that sense, it involves breaking down the information/problem that you are examining in order to understand it.

On the other hand, **synthesis** “is to put separate facts, etc. together to form a single piece of work”.<sup>6</sup> It also requires combining multiple sources or ideas into a whole.

If, critical thinking entails an analytical stance of a problem or idea, in a logical way and through a systematic step by step approach, on the other hand, in many cases, it also involves formulating and generating new ideas and innovative solutions, recalling creative thinking capabilities as well. Thus, critical and creative thinking should be understood as interdependent and complementary approaches (Ferreira, 2016).

Remember: Looking back over your Mu.SA learning journey, we have already explored in the MOOC what is creative thinking and presented some guidelines, strategies and tools to enhance your creative practice. You may want to look again and have a think about some of the questions in relation to this module.

In sum, analyze and synthesize information is part of a critical and creative thinking process, and, thus, is a useful ability towards a critical, creative and informed museum practice.

There are many situations in **museum** work that demand the ability to analyze and synthesize information. For example, when there is a need to solve problems and make quality decisions, present new solutions, design new strategies and review goals,

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<sup>5</sup> From Cambridge Dictionary: <http://bit.ly/2YZtWAm> (accessed 15 December 2019).

<sup>6</sup> From Cambridge Dictionary: <http://bit.ly/35AjnX7> (accessed 15 December 2019).



produce new ideas, solutions and perspectives that altogether add value to the museum mission.

Many of these situations involve informed decisions driven by evidence (**fact-driven**) by collecting, analysing, interpreting and evaluating a disparate set of information, sources, data, facts, observable phenomena, internal reports, surveys and research findings, including up to date with current advances in knowledge around a certain topic (e.g. through books, articles and other publications), and so on.

It also entails synthesizing, and thus, interpreting and reflecting on the information gathered, differentiating what is useful and less useful, combining ideas, making connections, drawing reasonable conclusions and reaching decisions.

Here are some brief examples:

- The head of the museum education department analyses last year program activities reports and evaluations, visitor studies, museum statistics (e.g. visitor numbers), and overall museum strategy, in order to decide on the next year educational program goals and priorities.
- The museum director reviews the last five years and decides to devise a new museum mission.
- The digital collections curator analyses current state of the art of the museum collections copyright to build a new open access policy.
- The digital interactive experience developer evaluates current free and open-source tools or prototypes available in the field (e.g. GIFT app and others - [GIFT project](#)) in order to adapt them to the museum new exhibition needs and improve digital visitor experiences on-site.
- The online community manager analyses museum web analytics and users' behaviour and feedback to access



whether objectives of the online audience plan are being achieved.

- The digital strategy manager reviews evidence of the museum digital transformation to assess the effectiveness of the ongoing digital strategy.

## 2.2. To whom it matters?

From the above examples, we highlight that the ability to analyse and synthesize is embedded in many museum activities and concerns every museum professional regardless of the job profile. Why? Because it is fundamental whenever there is a need to communicate ideas, make decisions, small or big, and solve problems. In museums, as well in other areas, there are many decisions to make along the way, either day to day decisions, either more strategically based.

In sum, every museum professional should strengthen and improve this ability over time. It requires practice and effort. In the next section, we will provide some guidance.





### 3. Building a critical, creative and informed museum practice

The ability to analyse and synthesize information, as you have learned, is essential to help museum professionals in their critical, creative and informed practice. In this final chapter we will focus on a 4-step approach to guide you. Finally, we will address a case study where the ability to analyse and synthesize information was embedded in a critical, creative and informed process by a community of Portuguese museum professionals in order to build updated statements around museum missions.



### 3.1. Developing a 4-step approach

It is time to guide you with some steps to get you started in making informed decisions and building your critical and creative museum practice. We will not present an exhaustive list, but some key steps and guidelines are introduced.

#### **Step 1. Frame the question: know what you are looking for...**

The first step is to frame the question. What are you trying to explore, achieve, solve or answer? In other words, what are you looking for?

#### **Step 2. Collect information, data and resources: know where to look for...**

From the starting question, there is a need to collect information about the chosen topic. You might ask yourself: what kind of information is available or is useful to answer my question? It really depends on the question, since there is a disparate set of information, sources and data available regarding the museum field.

Nevertheless, there are at least four main levels you might want to consider in your search to gather and select information: information from inside your museum; overall information from your national museum context; current advances in museum studies/museology from a broader context; and, finally, information widely accessible on the Internet.

Remember: while taking into account the above four dimensions, fact-driven is also a key aspect, which means to be capable of using evidence to make decisions. In a forthcoming module in this specialization course, the role and importance of fact-driven will be specifically addressed.

#### **Information from inside your museum**



There is a variety of information, from qualitative to quantitative, using traditional methods and others. While not exhaustive, this may include, when available:

- Museum strategy and related documents (mission, internal regulations, acquisitions policy, open access policy, and so on...);
- Annual reports of museum operations;
- Assessment reports (e.g. specific program activities);
- Exhibitions evaluation (e.g. front-end and formative evaluation);
- Museum statistics (e.g. visitor numbers on-site; website visitor analytics; social media profiling; online surveys; ticket sales – point of sale or website sales);
- Visitor studies, other research findings or resources (e.g. surveys/polls, focus groups; museum visitors' books, users' online reviews);
- IoT/Indoor Location tracking (e.g. visitor heatmaps and user flow);
- Museum publications (e.g. catalogues and others);
- Information collected from observation (e.g. how visitors react to objects in the exhibition, how they flow in the museum space, and so on...).

### **Information from your national museum context**

There is also a variety of information related to your national museum framework to take in consideration, such as:

- Overall museum statistics (visitor numbers);
- National surveys on museum related issues;
- Museum (and cultural heritage) related legislation;
- National museum policy;
- Publications, from technical to other standpoints;
- Professional and scientific journals;





## **Current advances in museum studies/museology from a broader context**

In the last decades there has been many developments in museum studies/museology, providing insights on museum innovation and advances in knowledge. This expansion can be testified by a growing number of conferences, events, courses and publications (e.g. journals, books). The more you read and get knowledge about a specific topic in the museum field the more you are able to potentially develop it in your museum practice and better serve your museum and **audience**.

If you are a beginner, here are some examples to guide you:

- From the professional perspective, there is an updated list of new publications available from the International Council of Museums (ICOM) database, which includes newsletters from national and international committees, reports and other publications: <http://bit.ly/34JSuP0>
- The Routledge is a well-known global publisher of academic books, journals and online resources in the humanities and social sciences, where museum related topics are included. A wide range of literature around museums and museums studies/museology is available: <http://bit.ly/2SfnaFo>
- MuseumsEtc is an independent publishing house based in Edinburgh and Boston, publishes books addressing contemporary issues in the museum field: <http://bit.ly/35KcTVw>
- The Inclusive Museum Research Network publishes a collection of books around museums and inclusion: <http://bit.ly/2MeUmZW>



There is also an increasing number of scientific journals related to museum studies/museology. Here are a few examples<sup>7</sup>:

- Museum International: <http://bit.ly/2PFttw1>
- Curator: The Museum Journal: <http://bit.ly/2SduDVC>
- Journal of the History of Collections: <http://bit.ly/2Qa3e4d>
- Visitor Studies journal: <http://bit.ly/35KouUv>
- Journal of Museum Education: <http://bit.ly/395QvIo>
- Museums and Social Issues: <http://bit.ly/34O1Rxe>
- Culture & Musées: <http://bit.ly/371G9Hx>
- International Journal of the Inclusive Museum: <http://bit.ly/2ZfPU2e>
- Museum and Society: <http://bit.ly/2MvgS0T>
- MIDAS journal: <http://bit.ly/2twACKC>

### **Information widely accessible on the internet: effectively navigating it**

The internet offers a wide range and variety of ways to learn more around a specific topic in the museum field, beyond the more traditional ways of conveying knowledge (articles, books, etc.) already mentioned before, that usually went through a process of peer-review or some sort of professional validation before being published.

TED Talks, online video lectures by experts (e.g. webinars), live streaming conferences and events, podcasts, blogs and social media are just a few examples of the array of available ways of conveying information, at our disposal.

For example, you might consider following museums or museum people that interest you; many use social media (Facebook, Twitter,

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<sup>7</sup> You can find a list of the most rated journals (related to 2018) here: <http://bit.ly/2ZhLZSt> (accessed 15 December 2019). Read more about the development of journals in museology from a global panorama in Lorente (2013).

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YouTube, etc.). You can track topics of interest and see what others are analyzing, discussing and exploring.

Here are a few examples that demonstrate a variety of ways of accessing information:

- *The Art of Relevance* (2017), a Ted Talk by the American Nina Simon: <http://bit.ly/3772cwr>
- *Museopunks*, a podcast for the progressive museum: <http://bit.ly/35MBEAu>
- *Mediação* (since November 2019), a podcast about mediation in the cultural sector (in Portuguese): <http://bit.ly/376WsmF>
- *Musing on Culture* blog (since 2010), by the Greek/Portuguese museologist Maria Vlachou: <http://bit.ly/2Qefh09>
- NEMO (Network of European Museum Organisations) webinars (since 2019), where museum experts give talks about current museum topics, challenges and approaches (e.g. *From Museum Education to Public Engagement - Trends and Practices in European museums*, by Margherita Sani - Istituto Beni Culturali of the Region Emilia-Romagna, Italy -, 11 April 2019): <http://bit.ly/34S5KkG>

But remember, while collecting information, data and resources from the Internet, mind the importance of evaluating those inputs and differentiate or select only what is reliable, appropriate and useful.

As you have learned in previous modules in the MOOC (e.g. “Evaluating data, information and digital content”) there are at least six criteria to guide you in evaluating websites or other internet sources: authority, accuracy, objectivity, currency, coverage and appearance.

Also, in the same context you learned 10 other complementary criteria: content, credibility, copyright, citation, continuity,

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ensorship, connectivity, comparability, context, including applying critical thinking skills. At this point, you may want to look again to the mentioned module and have a think about some of these criteria as they unfold the importance of evaluation information which is intertwined with the ability to analyse and synthesize.

### **Step 3. Analyse**

Imagine that you have selected a set of reliable information, sources and data related to your starting point question, and you have organized that information, filtering what is relevant and applicable concerning your topic... The next step will be analysing it.

To analyse you will need to read, understand and interpret the set of information, sources and data collected. It involves breaking down the information/problem that you are examining and is also about asking questions. For example:

- What are the key points?
- What are the arguments?
- Are there any assumptions (meaning the arguments accepted as true without proof)?
- Is the information presented as facts or opinions? Are there biases or prejudices?

There is another useful set of questions when formulating a logical and reasoned analysis (Lucas n.d.). For instance:

- *Why is it important?* Ask yourself why the information is significant or relevant and whether or not you agree.
- *What don't I see?* Is there anything important missing?
- *How do I know?* Ask yourself where the information came from and how it was constructed.
- *Who is saying it?* What's the position of the author and what is influencing them?
- *What else? What if?* What other ideas exist and are there other possibilities?



There are many tools you can use when analysing information. For example: take notes (e.g. underlining key terms, creating post-its, writing comments or summaries), create **mind maps** to structure information or use diagrams, by using arrows to show sequence: “this is followed by...”; cause and effect: “A leads to B because...”; “this is important because of that...”; or to categorize ideas based in hierarchy, among others.

#### **Step 4. Synthesize**

Once you have fully analysed a set of reliable information, sources and data related to your topic, the next step is to synthesize, meaning you should put separate facts and ideas altogether, which requires making inferences, connecting and combining ideas, and consider alternative points of view in order to reach something new: a conclusion, a decision or a new idea.

In sum, is about putting things together and making sense of the information collected in a meaningful way.

Remember that synthesize is different of the sum of several summaries. While in a summary you stress the main topics and arguments of an individual source, in synthesizing you will need to combine the information from several sources but including your analysis and interpretation, using your own voice and perspective.

There is a set of questions that can guide you at this phase. For example<sup>8</sup>:

- Are there any similarities, differences and/or trends?  
Comparing various ideas is key.
- Are there any connections between the different sources and ideas?

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<sup>8</sup> Adapted from: <http://bit.ly/2Zvc6FM> (accessed 15 December 2019).



- Does the information support or contradict your ideas? Compare what you've found with your initial thinking about the topic. Do you still think the same way or have your views changed in any way?
- Which of the ideas you have found are relevant to your topic?
- What strengths, weaknesses, opportunities, and threats can be identified?
- Are there missing gaps or alternative points of view?
- Are you considering all sides and arguments, especially those you might disagree with?
- [And finally] What are the main conclusions?

Some of the tools already mentioned (notes, mind maps, diagrams) can also be applied at this phase. Another tool worth mentioning is the SWOT analysis by identifying the strengths, weaknesses, opportunities, and threats. An additional tool is the **SCAMPER** method that you have learned previously in the MOOC module about creative thinking.

There is a variety of other tools or techniques that can be used, remember there is no formula that fits all situations. In the next section, for example, we will explore a case study where a variety of other tools were applied.

### 3.2. Case study: Collaboratively defining a museum mission

Next, we will present a case study where the ability to analyse and synthesize information was embedded in a critical, creative and informed process by a **community** of Portuguese museum professionals in order to build updated statements around museum missions.

#### **What is the context?**

In 2012 the Vila Nova de Famalicão Museum Network (VNFMN) (located in the north region of Portugal) was established. This

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network is composed of 12 organizations - museums and “visitable collections”<sup>9</sup>. All of them are located in the Famalicão municipality but are under different governing bodies (from private to public). The network is managed by a team under the Famalicão municipality council and the aim is to reinforce cooperation among the network of museum partners.

In 2018 the network decided to uphold their efforts in cooperation by starting an internal process of rethinking the network mission as well as the mission of each museum partner.

They started by acknowledging the need to clarify who they were and what they wanted to be, and that meant readdressing their mission, understood as “the heart and soul of a museum” (CMVNF, 2019, p. 16). At that point, it was also recognized that the majority of the partners had museum missions that were merely a set of descriptive museum functions (to acquire/collect, conserve, research, communicate and exhibit...) - and museum’s functions should not be considered and end in themselves - while others had not yet defined a mission at all. Thus, this was the opportunity to engage in an exercise of internal analysis to define clear missions that would enable a deeper understanding of what these museums and professionals do what they want to do.

The goal was to challenge all partners and the network itself to draw new public statements in a collaborative way, that would include a vision, mission, objectives, actions, and inspiring key words. The outcome would enable sharing their vision with society

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<sup>9</sup> The Portuguese Museum Act (2004) foresees the category of “visitable collections” (*colecção visitável*), meaning those organizations that ensure public visitation and preservation of museum collections but do not have the means to fulfill all museum functions that the Law establishes in order to consider them a museum (e.g. study and research, collecting, inventory and documentation, conservation, security, interpretation and exhibition, and education).



and contribute to enhance communication (internally and externally) in a more clear, informative and inspiring way.

### **How? A collaborative, creative and reflexive process**

Having framed the goal: new and updated mission statements, the first step was to engage in a “introspective journey” that started with a seminar/workshop “Being/Making Museums” (2018) to discuss and reflect on the future of the Network. The seminar and following steps were facilitated by Alice Semedo<sup>10</sup>, Professor and researcher from the University of Porto.<sup>11</sup>

In that context, a “100-day work plan” (November 2018–November 2019) was drafted (CMVNF, 2019). Such methodology involved a shared reflection among the museum professionals involved, where a critical, creative and informed thinking was part of the process. In such process, the ability to analyse and synthesize information and ideas from disparate resources was also crucial.

Part of the work was structured around formal presentations to provide a more theoretical framework that would contribute to a shared understanding of concepts among the group of museum professionals involved. In that context, examples of best practices regarding museum missions’ statements were also analyzed and discussed, taking also into account the international development

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<sup>10</sup> Alice Semedo is an Assistant Professor at the Department of Heritage Sciences and Techniques and an integrated researcher at CITCEM – Centre for Transdisciplinary Research Culture, Space and Memory, Faculty of Letters, University of Porto.

<sup>11</sup> This process, at this final phase, included also the participation of Access Culture, a not-for-profit cultural association that promotes physical, social and intellectual access to cultural participation. <http://bit.ly/39x4szk>



and state of the art, namely the ongoing discussion within ICOM regarding a new museum definition.<sup>12</sup>

An informed reflection was also built around relevant documents of reference in the broader museum context, that were also analysed, such as the ICOM Code of Ethics, but also the 17 Sustainable Development Goals of the UN 2030 Agenda.

Overall information from the national Portuguese museum context was also considered, namely the Portuguese Museum Act (2004), as a key reference framework.

The analysis included also information from inside the Network and the museums that are part of it, such as internal documents like museum programmes, regulations and policies procedures related to different museum functions to reflect upon the concepts embedded and the driving *raison d'être* of each of the museums that integrate the Network.

On the other hand, the process included informal and dynamic approaches to stimulate sharing and critical thinking in small groups but also with all parties involved.

The process also provided opportunities to stimulate creative thinking. Along with **brainstorming**, the teamwork included the creation of artwork on fabric, using several techniques to represent each museum (fig. 4). The goal here was to build responsibility and identity through enhancing networking relationships (CMVNF, 2019).

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<sup>12</sup> The ICOM museum definition is currently under discussion. The last revision dates back from 2007. We suggest reading: "[A New Museum Definition](#)" (Vlachou 2019) and also some other articles and comments on the new definition proposal available at: <http://bit.ly/2IVQ7Ze> (accessed 15 December 2019).



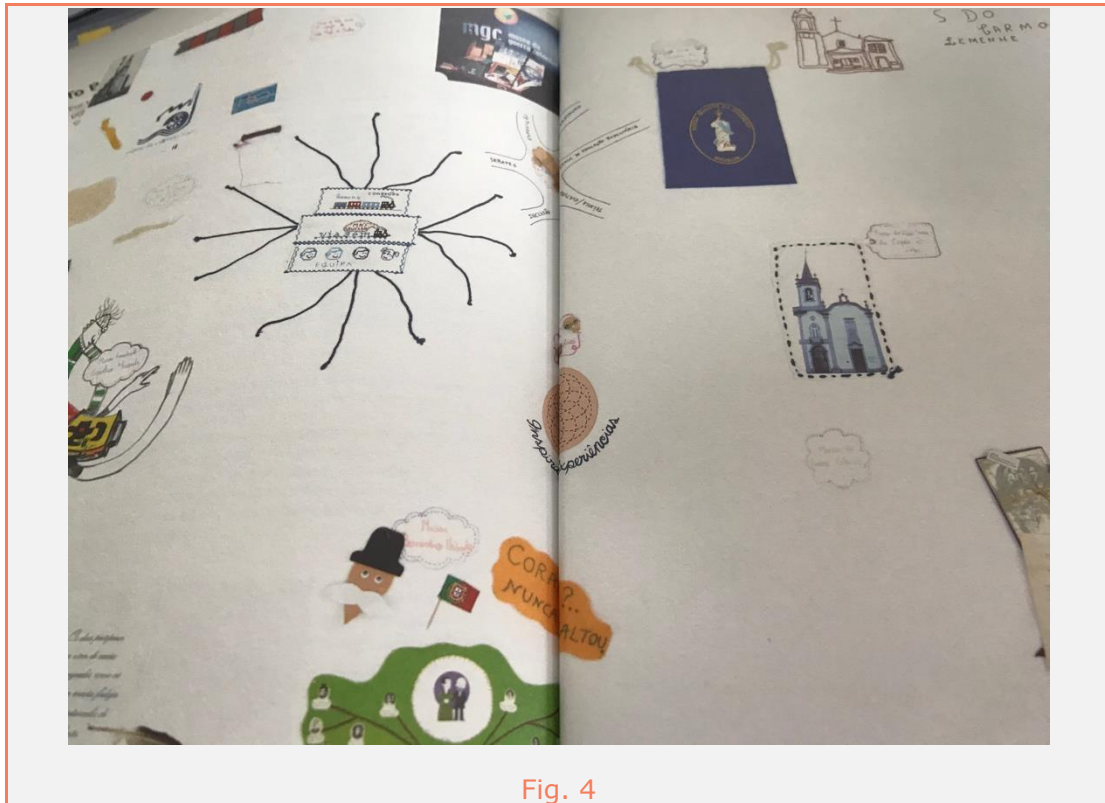


Fig. 4

One of the outputs included a video production with a selection of 100 words following the sentence “A museum is a place of...”. Participants express who they are and that they aspire to be (publicly available at: <http://bit.ly/2OEDQUs>; 01:48 minute listening).

### Reaching conclusions

A final step was to synthesize, by combining all ideas, contributions and the reflection made along the process. A number of tables were drafted to answer: what vision, mission, goals, actions and key-values? This step was based on transdisciplinary teamwork and through a collaborative and constructive discussion among the museum professionals participating.



The process was finalized by sharing the experience with others, which included a public debate “Being a Museum in the 21<sup>st</sup> Century” (26<sup>th</sup> November 2019, Famalicão) and the launch of the book [\*Definir a Missão... Da Necessidade ao Desafio/Defining the Mission... From Necessity to Challenge\*](#), where the results of the work were synthesized and presented.

As you have learned from this case study, an important point of museum work is to set your museum mission or rethink it along the way. In order to do that, it is essential to take a step back, analyze your resources and reflect around your core values.

There is no right answer for every museum, so you must review, evaluate and analyze a multitude of information and ideas, and then come up with a plan that incorporates the best of these ideas that are effective for your museum, whether that is the case for a new museum mission whether to any other situation where there is a need to interpret information and draw conclusions and make informed decisions based on the best analysis.

As this case study also demonstrates, there is a variety of ways and tools that enhance a critical, creative and informed museum practice, where the ability to analyse and synthesize information is fundamental in such process.



## 4. Synopsis

We started by discussing what is the ability to analyse and synthesize information as part of a larger process of critical and creative thinking. We also pointed out its usefulness towards a critical, creative and informed museum practice, and the need of strengthening and improving these abilities by every museum professional.

In the final chapter we focused on a 4-step approach to guide you in making informed decisions and to help building your critical and creative museum practice. Finally, we addressed a case study where the ability to analyse and synthesize information was embedded in a critical, creative and informed process by a community of Portuguese museum professionals in order to build updated statements around museum missions.

We have come to the end of the module “Analyse and synthesize information”. Do share your opinions with us and your fellow learners about what you have learned.

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## 6. Glossary

**Analyse and synthesize information** is the ability to knit together information from disparate resources.



**Audience:** individuals and groups who make use of the museum’s resources or facilities. (Adapted from Museums Association, 2015, glossary)

**Brainstorming:** a method first developed in the 1950s, which is widely used today in groups to gather as many ideas as possible around a certain topic and to build on those ideas to generate more ideas, recording it along the way. (Adapted from Norris & Tisdale, 2014)

**Community:** can be described as a group of individuals who share a particular characteristic, set of beliefs or attitudes. (Adapted from Museums Association, 2015, glossary)

**Competence:** is the ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development. (Adapted from CEDEFOP, 2014)

**Creative thinking:** means to look at problems or situations from different perspectives, find new solutions and thinking outside the box.

**Critical thinking:** a process of thinking carefully about a subject or idea, which may include conceptualizing, applying, analyzing, synthesizing, and evaluating information to reach an answer or conclusion, among other aspects.

**Digital competences:** involves the confident and critical use of Information Society Technology (IST) for work, leisure and communication. It is underpinned by basic skills in ICT (Information and Communication Technologies): the use of computers to retrieve, assess, store, produce, present and exchange information, and to communicate and participate in collaborative networks via the Internet. (Adapted from the Recommendation of the European Parliament and of the Council of on key competences for lifelong learning, 2006)

**Digital environment:** a context, or a “place”, that is enabled by technology and digital devices, often transmitted over the internet, or other digital means, e.g. mobile phone network. Records and evidence of an individual's interaction with a digital environment constitute their digital footprint. The term digital environment is used here as a backdrop for digital actions without naming a specific technology or tool. (Adapted from the DigComp – Digital Competence Framework for Citizens – glossary of new terms)

**Fact-driven:** being able to use evidence to take decisions.

**Innovation:** means a new idea or method, or the use of new ideas and methods. (Adapted from the online Cambridge dictionary)

**Mind map:** is a way to brainstorm your ideas and thoughts around a certain issue or problem using informal drawings. Usually, a mind map starts with writing or drawing a theme, problem or question at the center of a blank page, and all related subtopics are connected to the central topic in various directions and shapes.

**Museum professionals:** include all staff of the museums and institutions qualifying as museums [...] and persons who, in a professional capacity, have as their main activity to provide services, knowledge and expertise for museums and the museum community (ICOM Statutes, 2017, article 3, section 3, p. 3).

**Museum:** is a non-profit, permanent institution in the service of society and its development, open to the public, which acquires, conserves, researches, communicates and exhibits the tangible and intangible heritage of humanity and its environment for the purposes of education, study and enjoyment (ICOM, 2007).

**Problem solving:** is related to the capacity to engage in cognitive processing to understand and resolve problem situations where a method of solution is not immediately obvious. (Adapted from the DigComp – Digital Competence Framework for Citizens – glossary of new terms)





**SCAMPER:** is a method that guides the process of rethinking a problem and trigger new ideas. The name SCAMPER is the acronym of 7 questions: S=substitute; C=combine; A=adapt; M=modify; P=put it to some other use; E=eliminate; and R=reverse or rearrange.

**Transferable competences:** mean those competences that are transversal to several professions (jobs or careers). Transferable skills include soft skills and hard skills. Soft skills are related to interpersonal capabilities. For instance, leadership can be considered a soft skill, as can communication and creative thinking, among others. Hard skills are defined more technically. For example, proficiency with MS Office Suite applications, or the ability to manage time using Outlook could be understood as hard skills. (Adapted from the online Cambridge dictionary)

## 7. Further reading

**"Critical Thinking."** (2009). QualiaSoup. From: <http://bit.ly/2ZaDmta> (video 05:12 minute listening)

Short video about some of the principles of critical thinking. It argues that critical thinking refers to a diverse range of intellectual skills and activities concerning with evaluating information as well as our thought in a discipline way; it also focus on the attitudes of a critical thinker; the role of skepticism and reasoning; the barriers to critical thinking; the qualities of a critical thinker; and, finally, the benefits of critical thinking.

Agoos, S. (2016). **"5 Tips to Improve Your Critical Thinking."** TED-Ed. – Lessons Worth Sharing. [Lesson by Samantha Agoos; Narration by Addison Anderson; Animation by Nick Hilditch]. From: <http://bit.ly/2M92Rp9> (video 04:30 minute listening)



Every day, a sea of decisions stretches before us, and it's impossible to make a perfect choice every time. But there are many ways to improve our chances — and one particularly effective technique is critical thinking. Samantha Agoos describes a 5-step process that may help you with any number of problems: 1) Formulate your question (know what you are looking for...); 2) Gather your information; 3) Apply the information (what concepts are at work? What assumptions exist? Is my interpretation of the information logically sound?); 4) Consider the implications; 5) Explore other points of view.

**"Thinking Critically."** (2016). The University of British Columbia (UBC) Learning Commons. From: <http://bit.ly/354vSZQ> (video 07:38 minute listening)

The short video claims that critical thinking is a skill and a habit that can be developed over time with practice. It presents seven steps to develop your critical thinking skills: 1) Questioning & assessing information; 2) Be skeptical; 3) Understanding by making connections; 4) Challenge your assumptions; 5) Forming logical conclusions; 6) Reframing & incorporating different perspectives; and 7) Communicating and clarifying your own thoughts.

The Foundation for Critical Thinking. (n.d.). ***Glossary of Critical Thinking Terms: A Guide to Critical Thinking Terms and Concepts.*** From: <http://bit.ly/39hRJAp> (5-minute reading)

This glossary explores the following terms: accurate, ambiguous, analyze, argue, argument, to assume, assumption, authority and bias.

**"Museum Trends: How Your Museum Can Collect and Use Data."** (2018). In *Locatify*, 13-2-2018, from: <http://bit.ly/2Sc9BXf> (8-minute reading)

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A short article about different types of data and collection methods available to museums. It also explores on how these various types of data can help improve your museum.

