

**ALMA MATER STUDIORUM – UNIVERSITA' DI BOLOGNA**

Second Cycle Degree Programme in  
9224 - “Digital Humanities and Digital Knowledge”

## **NoStos nella pelle!**

A gamification project for children at Palazzo Fava, Bologna

Design Brief for the final project of the course  
92986 - Digital Heritage and Multimedia (I.C.)

Referent professors: Prof. Caraceni Simona, Prof. Pescarin Sofia

Presented by:

- |                        |                 |
|------------------------|-----------------|
| ○ Bonifazi Federica    | Mat. 0001026839 |
| ○ Giacomini Sebastiano | Mat. 0001057119 |
| ○ Veggi Manuele        | Mat. 0001025603 |

a.y. 2021/2022

## **Table of Content**

1. Introduction	3
1.1. Context	3
1.2. Concept	6
1.3. Goal	10
1.4. Requirement	10
2. Development	11
2.1 The story	11
2.2 Description of the interaction between the project and the users	14
2.3 Development to reach cognitive goals	16
2.4 Foreseen workflow	18
2.5 Further development and maintenance issues	19
Team roles	19
4. Bibliography	21
5. Appendix. A brief analysis of Carraccis' frieze at Palazzo Fava	23

# 1. Introduction

## 1.1. Context

“NoStos nella pelle!” is a **gamification project** based on one of the decorative frescoes made in 1584 by Annibale, Ludovico and Agostino Carracci at **Palazzo Fava**, Bologna. The iconographic subject of the chosen fresco is the **myth of Jason and Medea** and is placed in one of the first halls of the first floor of the palace. Since its acquisition by Fondazione Cassa di Risparmio di Bologna (2005) and during its current administration by Genus Bononiae, the hall has not been promoted as a cultural good *per se*, rather the entire hall is only temporarily open exclusively to host non-permanent exhibition. The decorative frescoes of the hall are therefore put in background and their promotion even at a local level is insufficient. Many surveyed attendants denounced how the palace is mainly visited by foreign tourists. Residents of the metropolitan area of Bologna seldom visit this place and the appeal for children and families is insufficient.



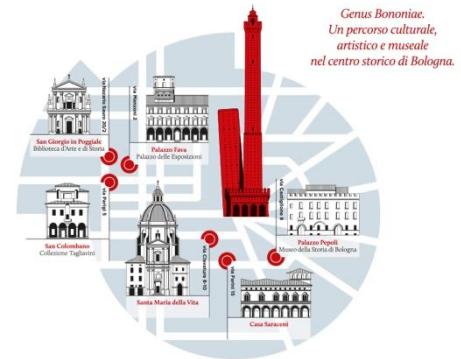
Figure 1. Annibale, Ludovico and Agostino Carracci. History of Jason and Medea (detail). Palazzo Fava, Bologna

Starting from these prerequisites, our project aims at **making the Bolognese audience more conscious of such valuable paintings** and in particular to help children familiarize with the local heritage. In synthesis, from the perspective of the hosting institution, “NoStos nella pelle!” aims at increasing the number of visitors. However, this objective is not pursued at a generical level, rather it focuses on a specific audience, i.e. **children** (approximately elementary school) living in the city of Bologna. Indeed, the attraction of this specific kind of demographic will support a virtuous cycle for Palazzo Fava. Indeed, the presence of young visitors will catalyze a higher request for educational activities which will result in an increasing appeal of the palace and its frescoes.

The above-mentioned features and in particular the insufficient attention paid to promoting the frescoes can be seen also in the available online assets. Only a section of the website briefly describes the value of Carracci’s paintings, and the available reproduction has mediocre quality standards. Therefore, **different assets must be identified**. For the development of this project, two main

alternative sources have been used. Wikimedia offers a [good photographic documentation](#) of the project in public domain. Secondly, in 2021 the *Palazzo Fava. Palazzo delle Esposizioni* exhibition was organized, aimed at valorizing Carracci's friezes. In this occasion a catalogue was printed (Bellettini, 2021), which is now gratuitely available on [Calaméo](#). This volume is particularly helpful to extract relevant pieces of information and provide a good reproduction of the paintings. These sources, however, cannot be considered but temporary. In our opinion, a high-definition reproduction of the friezes: for instance, a giga-pixel scansion could be a valuable asset for the palace and Genus Bononiae itself, as it could e.g. pave the way to new projects to promote these goods in the digital world.

The **pre-existence of previous material is a relevant support** in the development of this project. These assets include for instance educational activities proposed by Palazzo Fava and other didactic material available in print or online to transform the mythological narration into a captivating story for children. In particular, the deeds of the Argonauts, Jason and Medea have been retold many times also in **publications specific for children**. This existing literature is crucial in the creation of explanatory texts and animation. Lastly, the presence of Genus Bononiae as reference body for Palazzo Fava is for sure an encouraging aspect: it works as a network of cultural goods in the city centre and promotes this heritage at local and global level.<sup>1</sup> This organization may encourage the sharing and the extension of projects from a site to another, with a possible technological reuse and with a wider application of some of successful strategies and approaches in the promotion of cultural goods.



At the light of these consideration, we concluded that the best solution to implement the project “*NoStos nella pelle!*” was an **on-site application**, as this format is the most suitable with the nature of temporary exhibition venue of the palace. We strongly believe that, in particular for younger visitors, technology is a valid support to enhance the aesthetic experience: the entire project is hence to be considered as a **didactic activity to comment and better understand the hidden masterpiece** by the Carraccis. Indeed, the on-site experience consists of a tablet thanks to which the user has access

<sup>1</sup> Between 2020 and 2021 Genus Bononiae was a protagonist of a fruitful collaboration with “[Factum Foundation for Digital Technology in Preservation](#)”, which resulted in several projects concerning *Polittico Griffoni* and the *Lamentation* by Nicolò dell’Arca in Santa Maria della Vita. These experiments paved the way to the exhibition *La Riscoperta di un Capolavoro*, at Palazzo Fava. See: Lowe, 2020 and Natale & Cavalca, 2020.

to the application and the digital material. In this perspective, the dialogue between the authenticity of the work of art and the interactivity and appeal of the videogame wants to offer a pleasant activity, to help children valorise the cultural heritage of their home town.

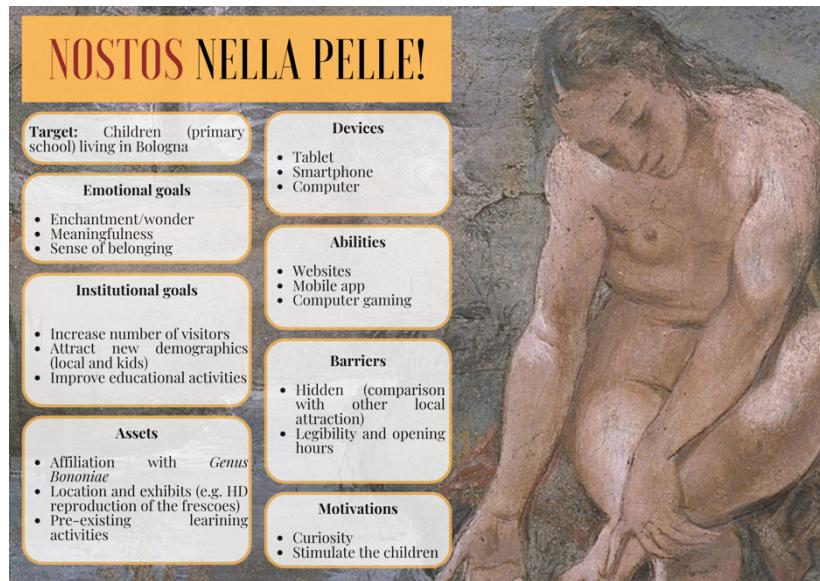
In synthesis, “NoStos nella pelle!” has as primary aim to **take local cultural assets closer to children**. The resulted outcome of this project is making users more conscious of the cultural assets of the city they live in. Using the filter of human geography, this gamification experience allows to redefine users’ *sense of place* (see Minca & Colombino, 2012, p. 27) and its emotive enhancement: the visitor will hence “learn to experience the world in a new way” (Gee, 2003, p. 45). To achieve this goal, the project has to be developed focusing on a specific *persona*.

The “implied user” of this application is a child aged between 5 and 10 years old, indicatively a **student at primary school**. One of the main peculiarities is the fact that they live **in Bologna**: this justifies the fact that the project is mainly thought in Italian. Further versions may add English translations available as audio recordings and / or subtitles. These young visitors may be motivated to join this project mainly due to curiosity, which should be catalyzed also by the chosen ludic medium. Yet the collaboration of the parents (or generically the educators) is still crucial: it is more likely that they will propose a new activity to their children, and they may be interested in an enjoyable activity which can merge together fun and education.

The foreseen *persona* holds however **essential competencies and abilities with new technologies**, which presumably might be shared by all the children who are known to be “digital native”. This set of skills mainly covers basic interaction with different devices and digital assets online (such as a website). A very basic experience with computer gaming is also encouraged, but not essential, as all the instructions will be provided within the app and assistance will be provided by trained assistants on-site. As mentioned above, the application will run on tablets. Nonetheless, also other devices might be used, presumably in the preparation of the visit: an *ad hoc* website will be dedicated to the project and will provide all the useful information. To this end, smartphones and computers might be used to surf the web.

## 1.2. Concept

The following conceptual map synthetizes the main aspects covered in the precedent paragraph:



Map 1. Conceptual map

From a stricter museological point of view, the project embraces some of the best-known approaches. In particular, the *Nouvelle Muséologie*, even though now revised by new tendencies (e.g., post-modern museum), provides a valid theoretical framework for this project. In this perspective (Marini Clarelli, 2011, p. 23-25):

Il professionista museale, inteso soprattutto come attore del cambiamento, e il visitatore, investito di un ruolo e creativo, collaborano alla realizzazione di un museo che non può più essere racchiuso in un edificio, ma si amplia al territorio e investe anche le abitazioni, i luoghi del lavoro, della festa, del gioco. Acquistano rilevanza i temi dell'identità culturale, della mediazione, dell'interdisciplinarietà e si teorizza l'abbandono del "museo degli oggetti" in favore del "museo delle idee"; [...] s'invoca il passaggio dal museo-collezione al museo-discorso.

This definition is justified by the fact that the promotion of the frieze is not the sole objective of the project. Considering the age of the implied users, providing specific analyses of the technique of paintings, or stressing the relevance of this frieze in the art-historical contexts would be premature. Rather, it allows a **familiarization with the iconography** of Jason and Argonauts.<sup>2</sup> Moreover, this gentle and ludic presentation of the myth (and of classical mythology overall) allows to make comparison and suggest external connection with other relevant cultural goods of the city portraying similar or related content (Neptune Fountain, Nymph Fountain etc.).

<sup>2</sup> Following the example of existing literature (Beaumont & Lepetit, 1999), the current project focus exclusively on the hero Jason and the adventures. The character of Medea is hence put in background and its tragical deeds are not presented.

Moreover, since Palazzo Fava as exhibition venue respects the main museological standards (Desvallées & Mairesse, 2010; see later) and seen that the current project relies on the implementation of digital technology, “NoStos nella pelle!” may **satisfy the requisites of virtual museum** as defined by Caraceni (2015). More specifically, **category B** of the cited taxonomy fits well the feature of the project.

<b>Need</b>	Education
<b>Interaction</b>	Closed
<b>Space</b>	Closed
<b>Content</b>	Selected object
<b>Virtual/Real</b>	Virtual on real
<b>Visitors' contribution</b>	Not allowed

Table 1. Virtual museum, category B (Caraceni, 2015)

Moreover, Genus Bononiae already promoted an exhibition that can be catalogued under this definition. Indeed, this museological paradigm perfectly suits the objective of our project and its educative purpose (Caraceni, 2015, p. 187 - 191):

Virtual museums of this kind have a very strong hypertextual pattern. [...] The need that this kind of virtual museums respond to is that for an educational pathway or itinerary that may go deeper, through the use of technology, into one or more aspects of the objects owned by the museum itself. [...] With its reliance on the need for educational resources, this kind of model can enhance the interpretation of the collection or highlight neglected pathways. The educational role of the museum is extremely important, as part of the mission of communicating heritage. [...] In this model of virtual museum, browsing is guided in such a way that it may also be considered a learning environment however the way the technology works means that users have no possibility of escaping from the pattern.

The educative intent of the project is hence evident and, in this vocation, fully mirrors the definition of museum proposed by Desvallées (himself a pioneer of *Nouvelle Muséologie*) in *ICOM Key Concepts of Museology*. Through “NoStos nella pelle!”, Palazzo Fava is supported in its mission of “communicating and exhibiting the tangible [...] heritage of humanity and its environment for the purposes of education, study and enjoyment” (2010, p. 57).

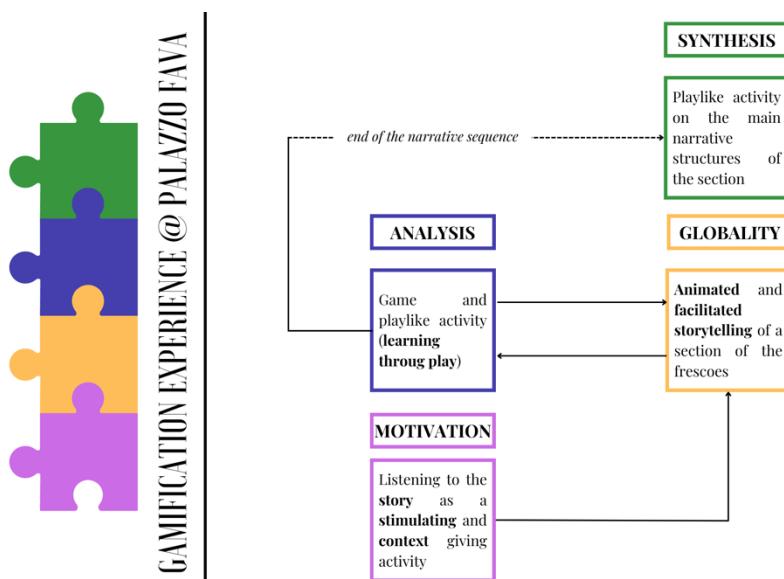
This purpose massively influences the experience design as the entire interaction with the visitor is strongly influenced by the most recent paradigms in pedagogy, such as the **concept of learning unit**<sup>3</sup> inherited by the Gestalt approach. This structure is articulated in four main steps:

1. Motivation
2. Globality
3. Analysis
4. Reflection and synthesis

With necessary adaptations (this technique has been used for languages teaching), this structure is particularly useful in a project of gamification. As pointed out by Gee (2003, p. 91), “the child, through action and reflection, **becomes a “self-teacher”**”, “training” his or her own mental networks of associations”. Thanks to the ludic framework provided by videogame, this learning is not exclusively limited to factual knowledge but can have a **persuasive impact on the perception of the hometown by children** and, in general, their sense of belonging (Nardone, 2020):

Videogiochi, console e *device* digitali sono sempre più strumenti di uso quotidiano, attorno ai quali costruire relazioni tra minori, giovani e adulti, grazie alle quali negoziare e ratificare regole, norme, ruoli, identità, appartenenze e valori sia individuali sia collettivi, facendo esperienza di socialità e solitudine, di apprendimenti formali e informali.

A general overview of the user experience can be subdivided into these four main phases accordingly:



Map 2. Experience design diagram

<sup>3</sup> The concept of *learning unit* has been widely implemented in didactics framework, such as in foreign language and culture classes. In the Italian-speaking literature, a precise description of this operative method (*unità di apprendimento*) can be read in Balboni (2002, p. 100).

As soon as the child opens the application on the provided tablet a short 2D-animation of the centaur Chirone shows up on the screen presenting himself and briefly the context in which the rest of the experience is going to take place. He will directly address the user, starting to create a feeling of connection, stating that he was waiting for him/her and asking directly for his/her help, stimulating a sense of inclusion and participation towards the development of the story. The choice of Chirone as a guiding character is not random, but relies on the fact both that he is seen as a parental figure for Jason in this specific myth, since he is the one to whom the little Jason is entrusted to, and on the fact that traditionally even in numerous other myths he is responsible for taking care of young heroes before and during their journeys and quests.

Following the brief presentation, a map of the Mediterranean Sea unfolds on the screen, as will further be explored in the following pages, allowing a visual representation of the steps the user will be taking to finish the game: each marker on the map corresponds to one level of the experience, on its turn consisting on a first explanatory step where animated scenes from the frescoes are shown and narrated by the voice of Chirone and a second interactive moment where the user is asked to complete a little game related to the scene he has just experienced. Once the frescoes narration is completed and the map on the tablet display is finally lit with all the steps of the completed journey, Chirone will show up again to leave the visitor with one last open challenge: throughout the experience a number of mythical creatures will be shown and presented to the visitors, explaining their role in the Greek imaginary and most likely leaving behind the curiosity of discovering more about them, therefore before let the visitors leave the museum the centaur will provide them with an online map<sup>4</sup> pointing to all the locations in the city of Bologna where artistic representation of those creatures can be found.

In conclusion, “NoStos nella pelle!” implements technological methodologies into a didactic framework, following the model of the *serious game*. As shown in the previous paragraph, several cognitive focus<sup>5</sup> are at stake, even though not at the same level. Indeed, the major role is played by meaningfulness - emotions – empathy. Albeit concentration, storytelling and memory are crucial factors for the effectiveness of this experience, the project does not aim at sharing exclusively factual knowledge. As it will be better defined in §1.3, the main purpose of this gamification experience is

---

<sup>4</sup> It will be asked the visitors to write their email address (most likely the parent’s), to which a link to access the online map will be immediately sent: a demo version of the map realized with the open access software QGIS and published on QGISCloud is visible [here](#). Together with the kids-friendly watercolour representation of the map of the city also an open street map layer is available, to get actual and clearer information on how to reach the marked locations.

<sup>5</sup> The five main cognitive focus here considered are i) attention - distraction, ii) language - narrative, iii) meaningfulness - emotions - empathy, iv) authenticity perception, v) memory – recall.

more emotional than cognitive. We would like children to wonder in front of the marvelous deeds of the Argonauts and to stress the meaningfulness of this mythological narration. Indeed, Greek and Latin myths have been (re)told through different artistic languages and some of these artifacts have a crucial role at urban level (e.g., Neptune Fountain in Bologna). The impact of “*NoStos nella pelle!*” is hence to be measured in the development of the sense of place and the sense of belonging of children to their hometown.

### 1.3. Goal

Following the ontologies and structures provided by the Visitor Box – Ideation Cards we decided to divide the ideal goals of our project in two main categories:

1. Institutional goals among which we focused on **attracting new demographics**, deciding to focus and target specifically children and local families, by insisting on the ways the museum and its collection could be perceived as a place for **educational activities** appreciated also by children. If reached, this goal should automatically translate itself into an **increase in the number of visitors**.
2. Cognitive goals were instead focused on developing sense of **enchantment** and **wonder**, addressing the ways a fresco like the one that is subject of our project could be told and communicated to be appreciated and loved by a younger audience. Doing so we aim also at creating **meaningful contents** that could truly make an impact on our targets, especially thinking on the chances that our subject may have of stimulating **sense of belonging** to the bigger context it is included in, i.e. the city of Bologna.

### 1.4. Requirement

Once children have been defined as our target audience, we decided to have them interact with a typology of devices they most likely know and have used before such as would be tablets and headphones, so to let better focus on the contents. Therefore, we prioritize their communication, using as main tools first storytelling and animation and then interactive mini games. The biggest challenge we had to face was to find ways that could allow our story to be told in a way interesting enough to ensure us not to lose the concentration and attention of our young visitors. Hence, we decided to categorically avoid static representation of the scenes on the fresco and rely solely on animation, we also decided to keep balance between the time spent on listening and watching the brief explanatory moments and the time spent actually interacting with it playing the related mini games.

By doing so we hope we could drastically reduce the risk of distraction making the users focus on the meaning of the story and stimulating their curiosity by leaving them little inputs on other possible deepening of the experience as the one provided at the end with the sending of the online map to take the experience on the streets of the city, so to wander around and have fun while simultaneously learning about mythology and getting to know the place they live in.

## 2. Development

### 2.1 The story

Once the context, target audience, assets, institutional and cognitive goals have all been defined we could finally start working on the actual design of the project and to think of real possible scenarios of use.

For this part we relied mostly on the PACT framework, organizing our workflow according to:

#### a) People

Keeping in mind that our experience is thought for children 5-10 we focused on keeping the total amount of time needed to complete it relatively restrained, to avoid risking losing the concentration of the users halfway and to ensure that the game will always be finished.

For this reason, not all the 18 scenes of the fresco are included in the experience, but only a selection of the six more relevant for the story and specifically, we thought of including:

- the moment Pelia recognizes Jason;
- the building of the ship Argo<sup>6</sup>;
- the fights with the monsters found during the journey by sea;
- the meeting with king Eeta and her daughter Medea;
- the taming of the bulls and the fight with the giants born from drangons' teeth;
- the conquest of the golden fetch.

A second very important aspect was that not every children in the selected range of age knows how to read properly so it was fundamental for us to allow audios for every explicative step of the experience i.e. the narration on the frescoes' animated scenes or the instructury parts of the mini games.

---

<sup>6</sup> This is the scene for which we realized the demo animation and storytelling and the related game.

The choice of reproducing the frescoes' scenes as they are, animated but not cartoonized (as it's instead the case for Chirone's introduction), was also dictated by the fact that due to their statistically short height at their age, for a child entering the fresco's room of Palazzo Fava would most likely be impossible to see and actually recognize anything of what is depicted on the walls: therefore the structure of the animation, with the progressive zooming towards the inside of the scene.

The cartoonized introductory part play a huge role on its own, in fact it not only introduce the visitor to the context and the state of the art of the story he or she is going to explore, but also it allows the visitor to have a clear, drawn representation of the most important characters, that due to the state of conservation of the fresco would elsewhere not so easily be recognized. The introductory animation plays indeed, with the colours of the frescoes on the colors and resemblance to make it clearer and more immediate for children to also recognize them in the fresco scene.



*Figure 3. Representation of the cartooned version (right) of the characters Jason and Pelia as used in the introductory summary reflecting the colours and features of the same characters as depicted on the frescoes (left)*

### b) Activities

According to the already stated necessity, when concerning with the design of the single activities we kept in mind our goal for what concerns the timing, imagining the scenes' explanation as no more than 2 minutes animation each, and calculating a maximum of 5 minutes for each game, reaching an ideal time for each visit between 30 to 45 minutes.

An interesting aspect we decided to considerate interest the security aspect: however on a physical level the location and the activities that could take place inside doesn't interfere in anyway, we identified a possible concern at a more emotive, psychological level: some scenes depicted on the

frescoes are quite crude and could be triggering<sup>7</sup> for young children and this definitely influenced our restrictive choice of the 6 scenes to analyse, alongside with the time factor.

Specifically we decide to not consider at all the last wall of the cycle that is concerned with the return to his homeland of Jason and the revenge of Medea, wall that has its apex in the scene where Medea kills her sons, therefore we preferred to end our experience with the scene depicting the conquest of the Golden Fetch.

Last aspect we took into consideration concerned cooperation: per se the experience is thought, designed and balanced as a single-player experience that children can be able to play on their own, however the supervision of a parent or another adult is recommended both as guidance and additional help and as a way to experience the museum together as bounding moment with their children. More space for cooperation is indeed left for the

### c) Context

This gamification project is designed to take place *in situ*, inside the first floor room of Palazzo Fava where the Jason and Medea frescoes are located. Currently the room is often used for hosting exhibition and is provided with all the fundamental needs, proper light and accessible routes<sup>8</sup> are also available. However, the location is rarely been used to host a young public and since we are addressing exactly this kind of audience we suggest a small rethinking of some issues in the space: the addition of some sort of barriers in front of the hanged paintings may be necessary to avoid incidents, as well as it would be useful to add some kind of seats, even just big cushions to move around as the experience advances could appear as an easily implementable solution.

As for the amount of person allowed to enter the room to experience the game, it will be mostly determined by the number of tablet effectively bought and made available by the infrastructure, although noting the current affluence this shouldn't create an issue, since we count on and strongly hope to reach an increase in the visitors numbers thanks to the implementation of this gaming experience, we would suggest the chance of make available on the website of the institution a booking service to secure a spot for the visit.

---

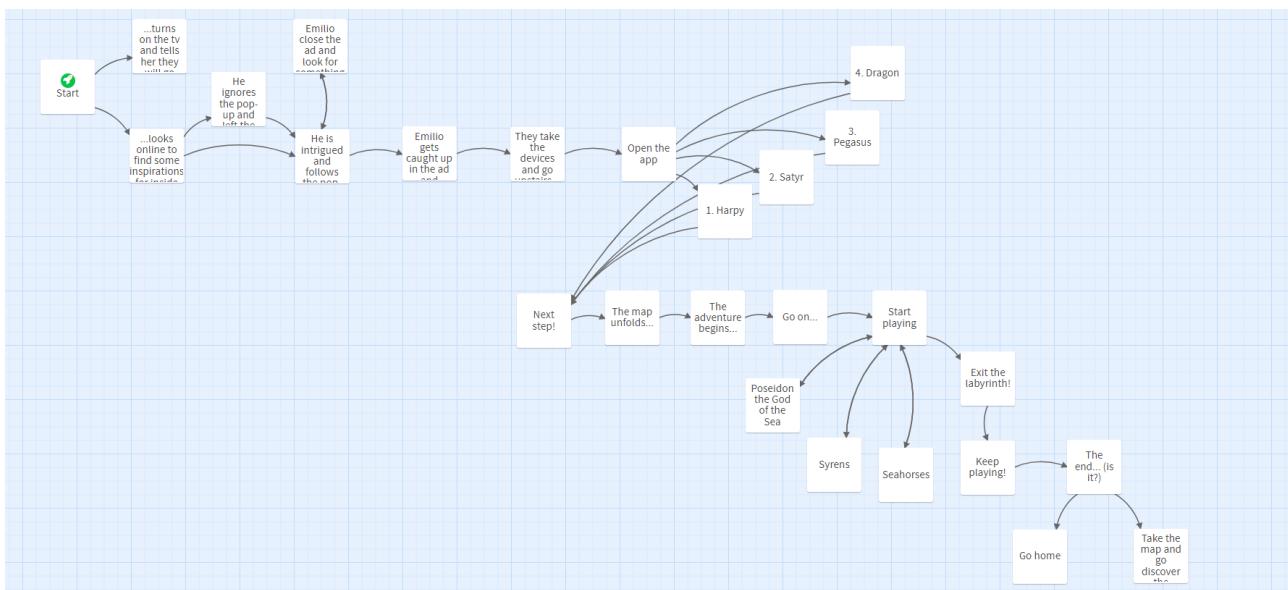
<sup>7</sup> As for example the first scene in the timeline that depicts the funeral organized by Jason's parents for the new-born, that however only pretended we perceived as potentially traumatic and decided to omit.

<sup>8</sup> First floor with the frescoes' rooms is accessible to wheelchairs users as stated in the [Accessibility Guidelines](#) on the museum's website.

#### d) Technologies

As for what concerns the technologies used, as already stated the experience relies on tablet as main devices for the visualization and interaction and headphones for the audio contents, but we prefer to refer to the next paragraphs for a better and more detailed description.

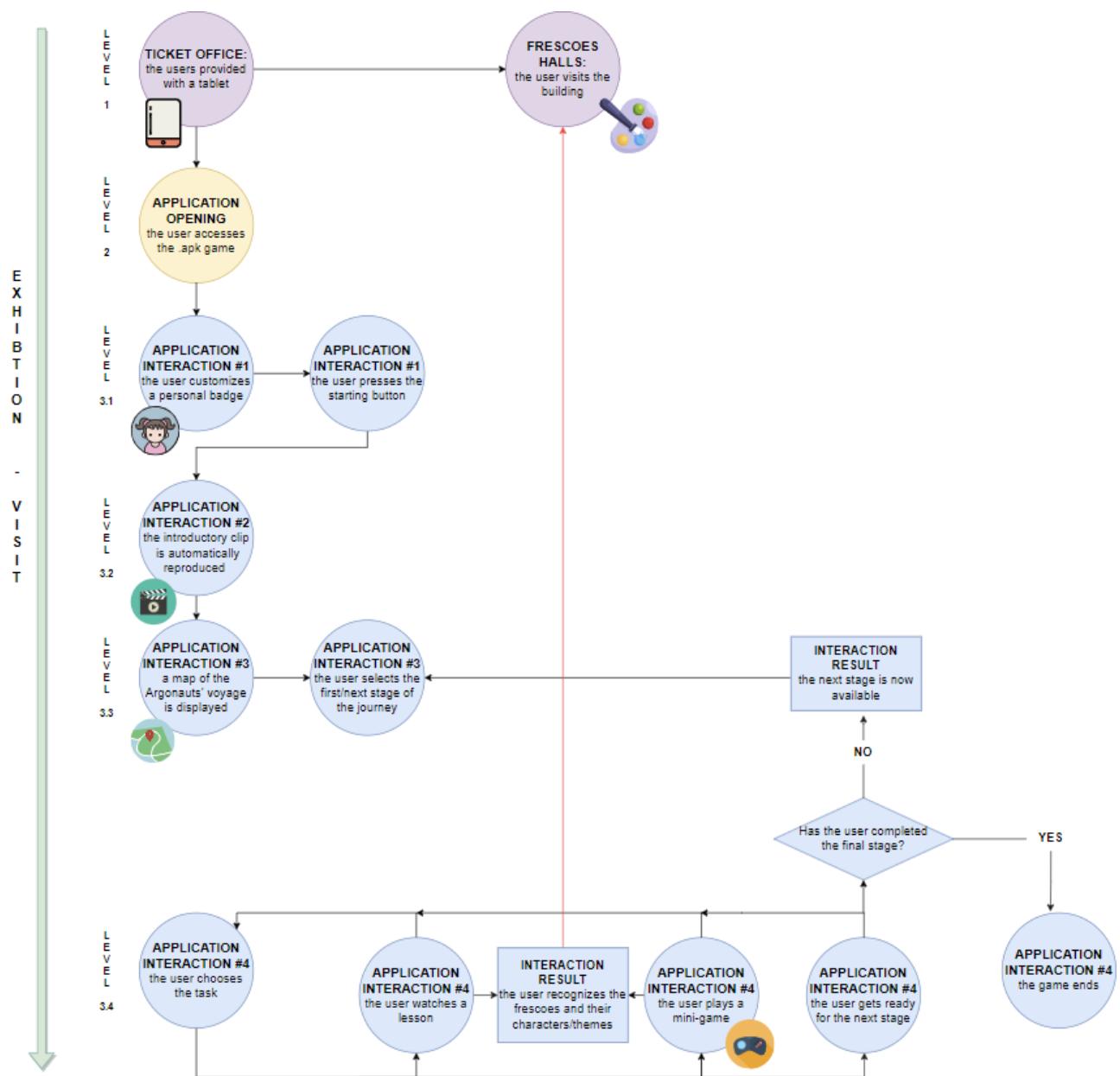
To summarize and better visualize a prototype scenario of how the experience in site should work we created a Twine story, accessible at [this link](#) that also includes all the realized demo animations and games, as well as reproduction of what the tablet application would look like once developed.



*Map 3. Representation of the structure for the Twine experience's prototype*

## 2.2 Description of the interaction between the project and the users

To achieve the cognitive and institutional goals mentioned above, a tablet immediately appears as the best device to deliver the product to the end-user. Most children are used to playing with mobile devices in their everyday life, so they would immediately feel comfortable with a tablet. It is a light and versatile tool that can be easily carried along during a visit while providing a high level of interaction in the museum context. In other words, the tablet is intended to be the main communication channel between users and the project, and the following Interaction Diagram clarifies its crucial role:



Map 4. Interaction diagram

What does this scheme mean? At first glance, the diagram highlights the articulated and layered structure of the interaction process. Depending on the task to be fulfilled and – commencing from the second step – the user-interface, the flow is organized in three different multilayered frames (Levels). The first step (Level 1) is relatively intuitive: guests are ready to visit the building, so the staff provide them with a tablet. The .apk game can now be run (Level 2) so that once the application is accessed, the actual interaction begins. From this moment on, the child will act as both learner and player. The next step introduces the most articulated frame (Level 3), where the visitor interacts with the cultural

heritage content. Since the entire project relies on the use of a single device, users are allowed to customize their experience. Therefore, the first task of this level (Level 3.1) consists of two different modules that ask the user to choose an avatar from a list and type in their name/nickname. This information will be automatically processed by the application and converted into a personal badge, displayed in the top left corner of the screen. When everything is ready, a start button appears on the interface: by pressing it, the user enters Level 3.2, consisting of an introductory video clip. At the end of this step, a map of the Argonauts' journey is displayed (Level 3.3): the user can now select one of several pinpoints on the screen, each representing a phase of the adventure.

At the beginning, only the first point is available; all others must be unlocked. Once a point on the map has been selected, a panel will appear (Level 3.4), allowing the player/learner to choose one of the following tasks:

- Explanatory moment: the visitor attends an animated lesson on one of the fresco scenes. It is the core of the whole project: cultural heritage content is made available to young visitors in an entertaining way. Indeed, the same frescoes introduced by the lessons are visible in the building's halls, creating a close link between the virtual activity and the physical environment. In other words, younger users can now establish a solid interaction with the physical space around them.
- Mini game: the didactic content of the project is then supported and enhanced through an entertaining interaction experience with the cultural background of the frescoes. The mythological narration and the characters of the Carraccis' work become the new targets of the interaction.
- Next stage: the visitor is now ready for new adventures by unlocking the next pinpoint on the map.

Users will repeat these three tasks until the game is over. At the end of the experience, visitors will discover that they have not only taken a trip on a map, but also a tour of a local treasure and a journey into the past, into the myth, into the history of a city.

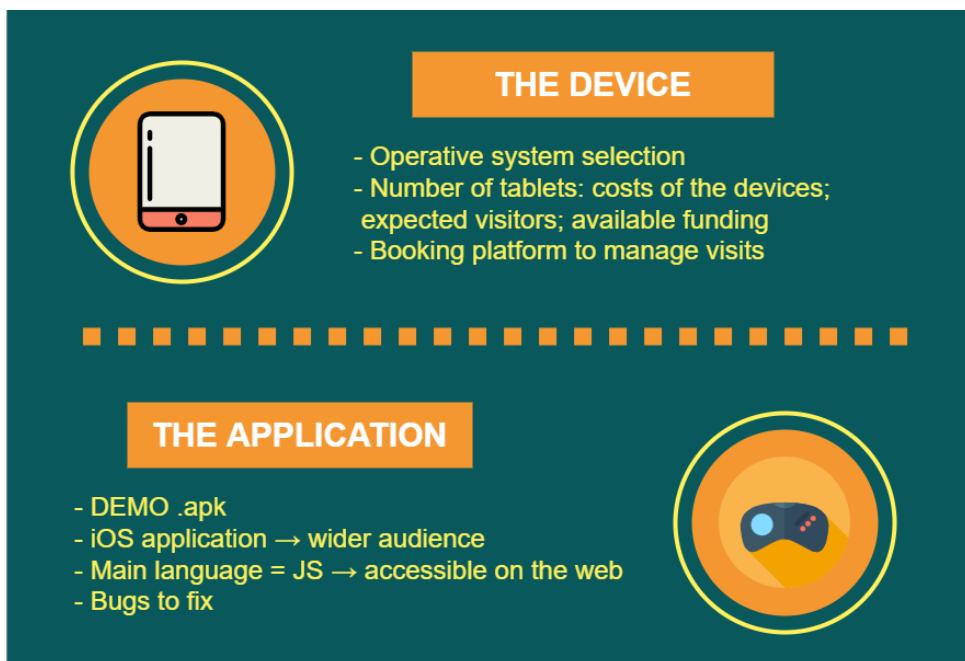
### **2.3 Development to reach cognitive goals**

The interaction schema defined in the previous paragraph relies on the above-mentioned objectives. In particular, some steps of the flow respond to the need to stimulate young visitors to get closer to the cultural heritage from an emotional point of view. In order to better understand how the designed project intends to tackle those cognitive goals, let's discuss them one at a time:

- **Develop enchantment/wonder:** the user interface and the interactive tasks are designed to fit both the educational content and the ambition to provide users with an engaging product. The combined presence of dynamic elements and the possibility to visualize, play, and interact with animated reproduction of the frescoes and their characters seek to create an enchanting atmosphere. Moreover, the painted scenes underwent a thorough selection, whose ratio coincided with the need to organize an enjoyable interactive storytelling as a way “to **evoke** rather than merely describe” (Pietroni, Ferdani, Palombini, Forlani, & Rufa, 2016)
- **Meaningfulness:** the core of the project consists of a series of learning units and mini-games, whose role is crucial in stimulating children to recognize meaning in what they observe and experience around them. “Meaning is not just a matter of concepts and propositions, but also reaches down into the images, sensorimotor schemas, feelings, qualities, and emotions that constitute our meaningful encounter with our world” (Johnson, 2007). Given this definition, the primary requirement one has to meet is to make the cultural heritage available for an “**encounter**”. In previous paragraphs, an issue related to the location and lack of emphasis given to the cycle of frescoes emerged. As a consequence, the first duty is to bring the cultural goods to the visitors’ level. Immediately after that, developers must consider how to stimulate feelings and emotions while providing children with interaction opportunities. Here is where the ludic component increases in importance. Let’s analyse a mini-game example: once users have encountered a series of frescoes’ scenes, they are asked to solve a game of synthesis, where they have to match some pictures with their fresco and re-organize them in the right sequence. In this way, they are forced to recall both the meaning and the feelings experienced during the narrative explanation, as a reflection and synthesis exercise at the end of a learning unit (see §1.2, Map 2).
- **Sense of belonging:** this last goal is strictly related to another institutional objective: to attract new demographics, above all children and locals. For this purpose, some new elements deserve to be highlighted. First, the possibility of customizing the experience with personal information (as specified in the previous paragraph) and the direct dialogue with Chirone are designed to put the child at the centre of the adventure. In this way, the user is helped to feel like the main character of the journey, whose final destination is nothing but their city, Bologna. Furthermore, the close link with the value of local cultural heritage is even reinforced through a series of references to other attractions and symbols of the city.

In the end, it is worth emphasizing how each of these goals would incredibly benefit from the physical presence of the user, although remote activity could pave the way for a more immersive experience later on.

## 2.4 Foreseen workflow



Map 5. Foreseen workflow summary

The project presented so far is explicitly designed to take place in Palazzo Fava. However, the same activity could be replicated almost anywhere, though the final goals should be carefully revised, due to the lack of close interaction experiences between the person and the frescoes' physical environment. In any case, a gamification project requires a device through which the user can actively interact with the cultural heritage target; thus, mobile devices and mobile applications present a series of evident advantages regarding costs, maintenance, and accessibility to the resource.

For the moment, let us focus on the on-site activity. Since the Institution is in charge of providing visitors with a tablet, the best device selection is a critical issue for several reasons. First, the costs of both the purchase and maintenance of the tablets deserve to be carefully considered with regard to the available funding; secondly, the choice of the tool also affects the file format of the application since different operative systems only support specific file extensions. A demo of the final application is already available to provide a tangible idea of what we expect the final product to look like. Since this prototype is a .apk file, it is supposed to be installed and accessed only on Android devices,

though the development of an iOS-compatible version of the application is warmly recommended to reach a wider audience both on-site and remotely. In other words, the demo is intended to show the general working of the project, exploiting the qualities of the Android operative system. Nevertheless, the final application is expected to work on any device. This last statement allows extending the issue also to PCs and laptops. Indeed, the prototype is mainly written in HTML, CSS, and - more important - JavaScript and C#, with a Unity game integrated into it: thus, some further adjustments and bug-fix would increase the remote interaction possibilities while acting as a showcase for future visitors. In conclusion, a brief note on the number of devices: the Institution must consider distinct solutions depending on the allocated funds. Since the project strives to attract a wider audience, the tablets' amount will probably require to be progressively increased to manage simultaneous visits.

## **2.5 Further development and maintenance issues**

The main challenge that remains open to further development for this application would be to manage to reach an even wider audience, by allowing contents also for foreign children and families, under this perspective the final map that Chirone leaves to the visitors at the end of the experience could not be intended anymore as a way of deepening the knowledge of ones' own town, and would lose its intended meaningfulness and goal of stimulating sense of belonging; however it could be interesting to develop other ways to keep this goal fulfilled by for example allowing the user to insert at the start of the game its country of origin and then imagine that the app could connect to a bigger database collecting world heritage and then query it according to the input country to find heritage related to The Argonauts' myth and then marked the correspondent location on a map of the selected country. This development would surely bring a number of other challenges and issues but would result in a great way to let the tourist live a second part of the experience when he is back home and it would be interesting to explore and deepen this kind of possibility!

### 3. Team roles

To achieve the set objectives within a reasonable amount of time, a subdivision of the workload was deemed necessary. The following table associates each member to its field of responsibility. As it can be stated, in particular to what concerns the first steps the team worked as a group, without relevant distinction in tasks.

Team Member	Project conception and development	Design Brief
Bonifazi Federica	<ul style="list-style-type: none"><li><input type="radio"/> Workflow Design</li><li><input type="radio"/> Media Research</li><li><input type="radio"/> Animation's development</li><li><input type="radio"/> Character design</li><li><input type="radio"/> Twine scenario</li></ul>	<ul style="list-style-type: none"><li><input type="radio"/> §1.2</li><li><input type="radio"/> §1.3</li><li><input type="radio"/> §1.4</li><li><input type="radio"/> §2.1</li><li><input type="radio"/> §2.5</li></ul>
Giacomini Sebastiano	<ul style="list-style-type: none"><li><input type="radio"/> Workflow Design</li><li><input type="radio"/> Media Research</li><li><input type="radio"/> Implementation of the demo version of the tablet application</li></ul>	<ul style="list-style-type: none"><li><input type="radio"/> §2.2</li><li><input type="radio"/> §2.3</li><li><input type="radio"/> §2.4</li></ul>
Veggi Manuele	<ul style="list-style-type: none"><li><input type="radio"/> Workflow Design</li><li><input type="radio"/> Media Research</li><li><input type="radio"/> Unity game development</li><li><input type="radio"/> Website interface</li></ul>	<ul style="list-style-type: none"><li><input type="radio"/> §1.1</li><li><input type="radio"/> §1.2</li><li><input type="radio"/> Appendix</li></ul>

We would like to thank Simone Tentori for joining the project as narrating voice of the available animations.

## 4. Bibliography

- Balboni, P. (2002). *Le sfide di Babele. Insegnare le lingue nelle società complesse*. Turin: UTET.
- Beaumont, É., & Lepetit, E. (1999). *Il tuo primo libro del fantastico*. Bergamo: Edizioni Laurus.
- Bellettini, P. (2021). *Palazzo Fava. Palazzo delle Esposizioni. Gli affreschi. Guida*. Bologna: Genus Bononiae.
- Campbell, S. J. (2002). The Carracci, visual narrative and heroic poetry after Ariosto: the ‘Story of Jason’, in Palazzo Fava. *Word & Image*, 18:2, 210-230.
- Caraceni, S. (2015). *Designing a taxonomy for virtual museums for the use of AVICOM professionals*. PhD Thesis, Plymouth University.
- Daverio, P. (2021). *L'esordio di Ludovico, Annibale e Agostino Carracci. Controriforma a Bologna, fra pubblico e privato*. Tratto da Rai Scuola.
- Desvallées, A., & Mairesse, F. (2010). *Key Concepts of Museology*. Paris: Armand Colin.
- Emiliani, A. (1984). Gli esordi dei Carracci e gli affreschi di Palazzo Fava. In AA.VV., *Bologna 1584*. Bologna: Nuova Alfa Editoriale.
- Gee, J. P. (2003). *What videogames have to teach us about learning and literacy*. New York: Palgrave MacMillan.
- Johnson, M. (2007). In *The meaning of the body: aesthetics of human understanding*. Chicago: Chicago University Press, p. IX.
- Lowe, A. e. (2020). *The Aura in the Age of Digital Materiality. Rethinking Preservation in the Shadow of an Uncertain Future*. Milan: Silvana Editoriale.
- Malvasia, C. C. (1678). *Felsina pittrice: vite de' pittori bolognesi*. Bologna: Barbieri.
- Marini Clarelli, M. V. (2011). *Il museo nel mondo contemporaneo. La teoria e la prassi*. Rome: Carocci editore.
- Minca, C., & Colombino, A. (2012). *Breve manuale di geografia umana*. Padova: CEDAM.
- Nardone, R. (2020). Videogiochi e processi educativi: nuovi scenari di media literacy. In S. Pescarin, *Videogames, ricerca, patrimonio culturale*. Milan: Franco Angeli.
- Natale, M., & Cavalca, C. (2020). *The Griffoni Polyptych Reborn in Bologna. The Rediscovery of a Masterpiece*. Milan: Silvana Editioriale.
- Perini-Folesani, G. (2006). Il fregio con la Storia di Giasone dipinto dai Carracci a Palazzo Fava. In M. Kokole, B. Murovec, & M. Sasel Kos, *Mediterranean Myths from Classical Antiquity to the Eighteenth Century*. Ljubljana: ZRC-SAZU.

- Pietroni, E., Ferdani, D., Palombini, A., Forlani, M., & Rufa, C. (2016). Lucus Feroniae and Tiber Valley Virtual Museum: from Documentation and 3d Reconstruction, Up to a Novel Approach in Storytelling, Combining Virtual Reality, Theatrical and Cinematographic Rules, Gesture-based Interaction and Augmented Perception. *CAA2015 KEEP THE REVOLUTION GOING Proceedings of the 43rd Annual Conference on Computer Applications and Quantitative Methods in Archaeology* (p. 67-78). Oxford: Archaeopress.
- Stanzani, A. (2006). Annibale frescante a Bologna, nei palazzi Fava, Magnani e Sampieri. In D. Benati, *Annibale Carracci*. Milan: Electa .

## 5. Appendix. A brief analysis of Carraccis' frieze at Palazzo Fava

The pictorial frieze of the *History of Jason and Medea* by Annibale, Ludovico and Agostino Carracci is a crucial document describing the pictorial Bolognese tradition towards the end of the 16<sup>th</sup> century. The three brothers, indeed, would play a crucial role in the development of a renewed style after the Mannerist experience, often presented in an ambivalent dialectic with the unprecedented manner of Caravaggio. The decoration at Palazzo Fava in 1584 marks the beginning of this revolution, being the first joint masterpiece of the three artists. The incredible value of this work was already appreciated in the 17<sup>th</sup> century, as Malvasia in his *Felsina pittrice* thoroughly describes the history of the composition, the iconography and the reception of the fresco (Malvasia, 1678, p. 368 - 373):

Dissi una dell'altre volte, cioè dipinta ch'ebbero la sala del Signor Filippo Fava, e che fu delle loro prime cose pubbliche e grandi, dopo il ritorno di fuori. [...] Allogata loro la sala per bassissimo prezzo, proposero ben tosto di rappresentare entro quel fregio le imprese di Giasone, come soggetto copioso e ferace, per isbizzarriarsi ne' varii pensieri vi si ricercano. [...] Il ritrovo fu di Agostino, che non contento di tante varietà che per se stessa porta la eroica favola, v'aggiunse lateralmente ad ogni quadro due Deità confacenti e simboliche al soggetto ch'entro rappresenti. Lodovico schizzò loro molte cose, andò disponendo i pensieri, correggendo e migliorando l'opra, ed Annibale quello fu che più d'ogn'altro vi faticò [...].

Se si volessero qui descrivere le finezze dell'arte, anzi del giudicio in queste fatture, più difficoltà degli stessi Argonauti nel grande acquisto incontrerebbonsi, essendo elleno tante e tali, che un'intero volume empirebbono. [...] Di collasù potei talvolta ben anch'io soddisfarmi, ed osservare in genere il ripiego di Annibale di mostrar sempre ne' quadri più di quello ch'anche vi sia. [...] Ma ancorché operazione così degna incontrasse il comune applauso, non fu d'intera soddisfazione al Signor Filippo, essendogline detto poco bene dagli emoli, in particolare dal Cesi, che gli oppose esser buona sì, ma troppo strapazzata: che Agostino veramente in que' termini di chiaroscuro s'era portato, massime in alcuni, egregiamente, ma quel ragazzaccio di Annibale avea tirato giù con quel suo modo impaziente e poco pulito; onde quelle storie, in tal guisa non ben terminate e finite, tenessero più dello schizzo e forma di primo sbocco, che di veri quadri aggiustati e compiti.

The thorough description of Malvasia is a valuable source to highlight at least two main features of the fresco concerning both stylistic features and original iconographic choices. To what concern the former aspect, the historian stresses the “modo impaziente e poco pulito” of Annibale, opposed to clear chiaroscuro of the elder brother Agostino. This peculiarity is crucial for proving what the young painter learned during his stay in Venice. Malvasia himself copies a letter by Agostino, where he describes the admiration of his younger sibling toward the Venetian pictorial tradition (“è rimasto

attonito e stordito, con dire che credeva bene di c'è stato gran cose, ma non si sarebbe immaginato mai tanto”), in particular Paolo Veronese, “che supera il Correggio in molte cose, perché è più animoso e più inventore”. The Venetian apprenticeship under the heritage of the late Titian style will be here reinterpreted to develop a personal solution to overcome the “stylish style” of Mannerism.

The frieze of the Argonauts, indeed, merges together different sources. As pointed out by Daverio (2021), Agostino's *inventio* of framing the eighteen narrative sequences with twenty-two figures of deities reminds back to the Renaissance. Moreover, it has been underlined (Perini-Folesani, 2006) how many peculiarities of these characters are directly taken from some of the most important interpreter of the “maniera moderna”, such as Raffaello and Michelangelo, and even from classical statuary, e.g., *Mars Ultor* at Museo Capitolino. On the other hand, Annibale proposes a new solution. This personal language is a historic watershed, in particular in the genre of the decorative fresco in the Bolognese area, whose tradition can be well summarized by Pellegrino Tibaldi at Palazzo Poggi or Niccolò dell'Abate and his frescos on *Orlando Furioso*, now exhibited in the Pinacoteca Nazionale di Bologna. Indeed, “the Carraccis advance a modern mode of directness and verisimilitude drawn from Correggio and Veronese” (Campbell, 2002, p. 227).

The novelty of the style is well mirrored also in the latter aspect, i.e., the handling of the iconographic theme. The *ritrovo* of this masterpiece is indeed to be contextualized within an intricated debate promoted by Council of Trent concerning the establishment of a figurative repertoire compatible with the canons of the Counter-Reformation. Indeed, it has been correctly noted (Stanzani, 2006, p. 434) that the frieze deals with a critical matter, already because the history of Medea and Jason is based on long series of violences, betrayals, frauds, and cruel atrocities. The personal interpretation of the three painters of such a compromising theme is hence far from the rigid paradigm proposed by the Church. However, the private patronage of an intellectual family such as the Favas may have allowed more flexible constraints in the *inventio*: as a matter of fact, the criticism reported by Malvasia concerns exclusively the style and the *dispositio*, not the subject of frieze.

The personal interpretation of the myth by the three artists is thus unprecedented and extremely captivating. This masterpiece, indeed, portrays “una storia giovanilmente antica per una pittura, almeno in quel momento, esemplarmente giovane” (Emiliani, 1984, p. XX). Already with Malvasia, it is hence highlighted how the new style derived from the Venetian experience is perfectly harmonized with the dynamicity and the richness of the mythological matter. According to the Bolognese historian, the theme was chosen for the possibility of “isbizzarrirsi ne' varii pensieri”. The

scenes are indeed populated by several anthropic, natural, and fantastic elements so that Annibale Carracci seems “mostrar sempre ne’ quadri più di quello ch’anche vi sia”.

This quest for detail is particularly evident in two fragments of the frieze: the *Enchantments of Medea* and the *First Encounter of Medea and Jason*.



Figure 4. Two scenes of the frieze: "The Enchantments of Medea" (a) and "The first encounter between Medea and Jason" (b)

These two details are extremely relevant. The former shows how the new style of the Carraccis is able to deepen a psychological inquiry of the portrayed character. Here Medea’s future as victim of male betrayal can be foreseen in the lyricism of the woman along the river. The very fact that she is naked suggests how the painter is not here interested in following diktats imposed by the Church, but in satisfying a specific taste for romance and chivalry that is persistent throughout the entirety of the 16<sup>th</sup> century. This perspective justifies also the attention to details (e.g. dresses) and marginal characters. The latter scene (Fig. 4b) is here a good example: the presence of the blind Cupid is to be read as a variation on the erotic *liaison* tying the two painted protagonists.

In *lieu* of conclusion, the cycle “is conceived as a romance not only by virtue of its subject-matter and approach to sources, but also through its stylistic idiom, and in the characterization of Jason and Medea” (Campbell, 2002, p. 216). This renewed taste for romance outside Catholic figurative orthodoxy makes the *History of Jason and Medea* by the Carraccis a crucial masterpiece in the history of art between Mannerism and Baroque. Moreover, this “pittura esemplarmente giovane” allows several opportunities to re-tell and reinterpret the frieze also in the digital world: a medium that per se allows to “mostrar sempre più di quello ch’anche vi sia”.