



MuSa

The experience manager
designed by Silvia Del Piano, Stefano Foti and Gianmarco Zizzo

PRODUCT IDEA



WHAT MUSA IS

MuSa has been thought of as an experience manager for the «Museo dell'Arte Classica della Sapienza». The basic concept of MuSa is to put the user at the center of the experience, satisfying his curiosity and offering him a customized way to visit a museum.



Going into details, we thought about many issues that a visitor has when he visits a museum such as:

- limited time for take a full visit
- meet on his path some pieces of arts that he does not like for various reasons
- the desire of having more details about an opera, but at the same time he does not like to have a guide



MuSa solves these issues in an interactive way!

When a visitor comes to the museum and decides to have an experience with MuSa, he is profiled, filling a brief questionnaire on his smartphone, through his interests and some other traits like age or time to spend into the museum; then, MuSa provides to the visitor a customized tour and supports him along the tour, supplying details and curiosities when he requests it.



HOW MUSA COMES TO LIFE

Through an online questionnaire, we gave life to some personas



Some personas would try an experience with MuSa and moreover they allow the collecting of some data during their tour to help to improve the service...



... other personas maybe does not need the company of MuSa, but they want to help the service get better too, so they allow the data collecting



At the end of the tour, they can also leave a quality feedback



HOW MUSA WORKS



Elena comes to the Museo dell'Arte Classica, but she does not need MuSa for many reasons. Anyway, she wants to help the improvement of the service, so she allows the data collecting during her tour, after filling the profiling questionnaire.

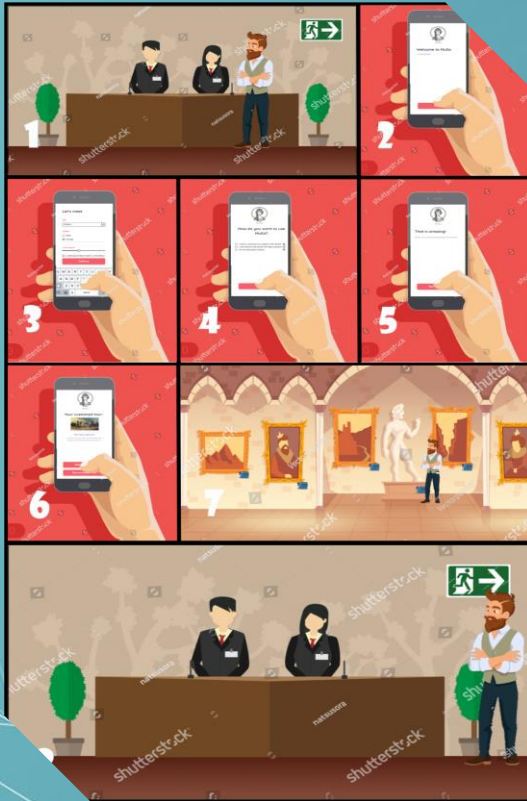
INTERACTION WITH MUSA



In the first idea, all the interactions with MuSa will occur through the visitor's smartphone with a web-app:

- ❖ fill in the questionnaires
- ❖ get a personalized tour
- ❖ ask to MuSa for further information and curiosities
- ❖ data collection

HOW MUSA WORKS



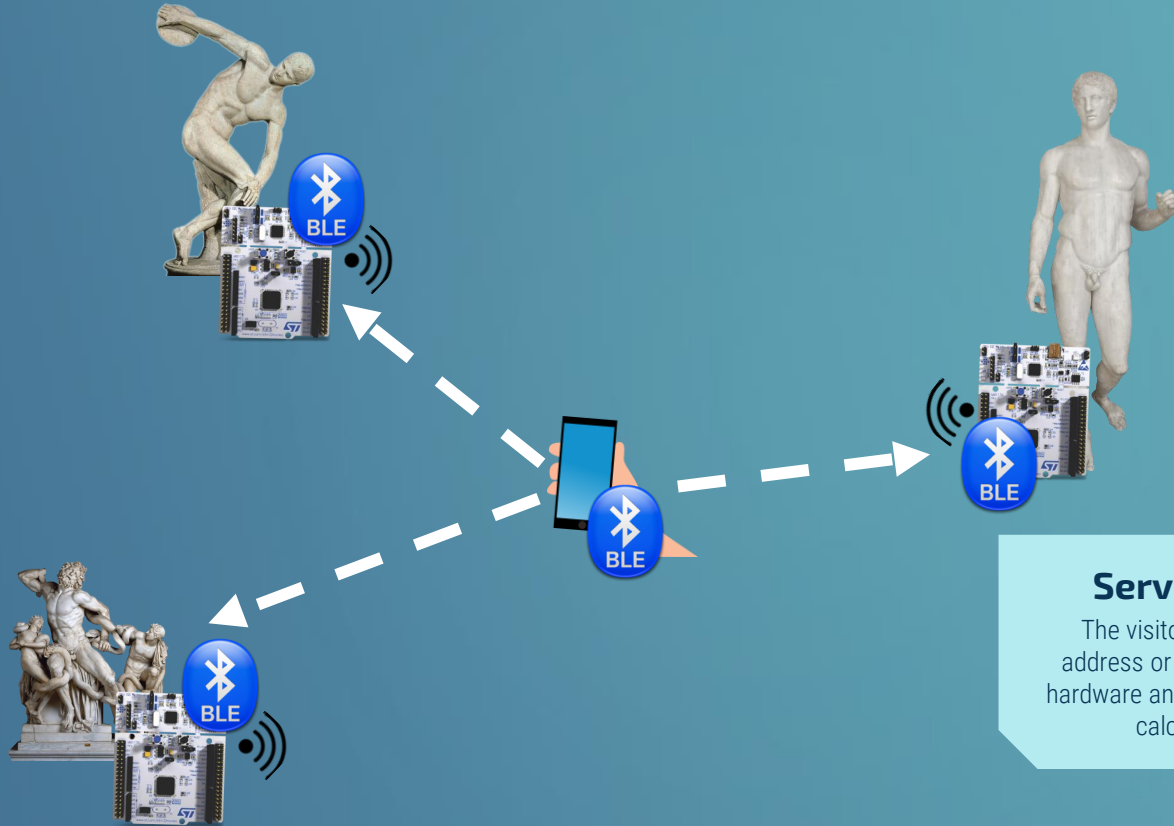
Enea comes to the Museo dell'Arte Classica and hearing about MuSa decides to have a tour with her. Firstly, he fills the profiling survey and MuSa provides him a customized tour, for example the tour that leads him to visit all the operas with the topic of war as background.

Enea starts to visit the museum following MuSa's suggestions, interacting with her through his smartphone. He can ask MuSa for extra information or curiosities! At the end of the tour, Enea will complete another brief survey to let the museum know his level of appreciation.



ARCHITECTURE OVERVIEW

POSITIONING ARCHITECTURE



Server based positioning

The visitor has a tag that advertises their MAC address or UUID. The signal is caught by specific hardware and which is then transmitted to server for calculating and gathering statistics.

SOFTWARE



Azure IoT Hub



App Service



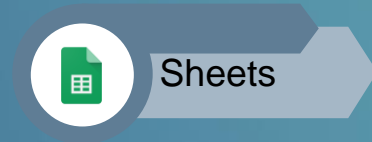
Azure ML



Azure DB

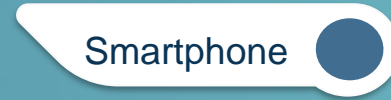


RIOT-OS

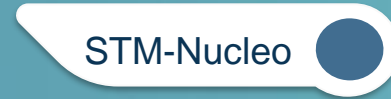


Sheets

HARDWARE



Smartphone



STM-Nucleo

PROTOCOLS



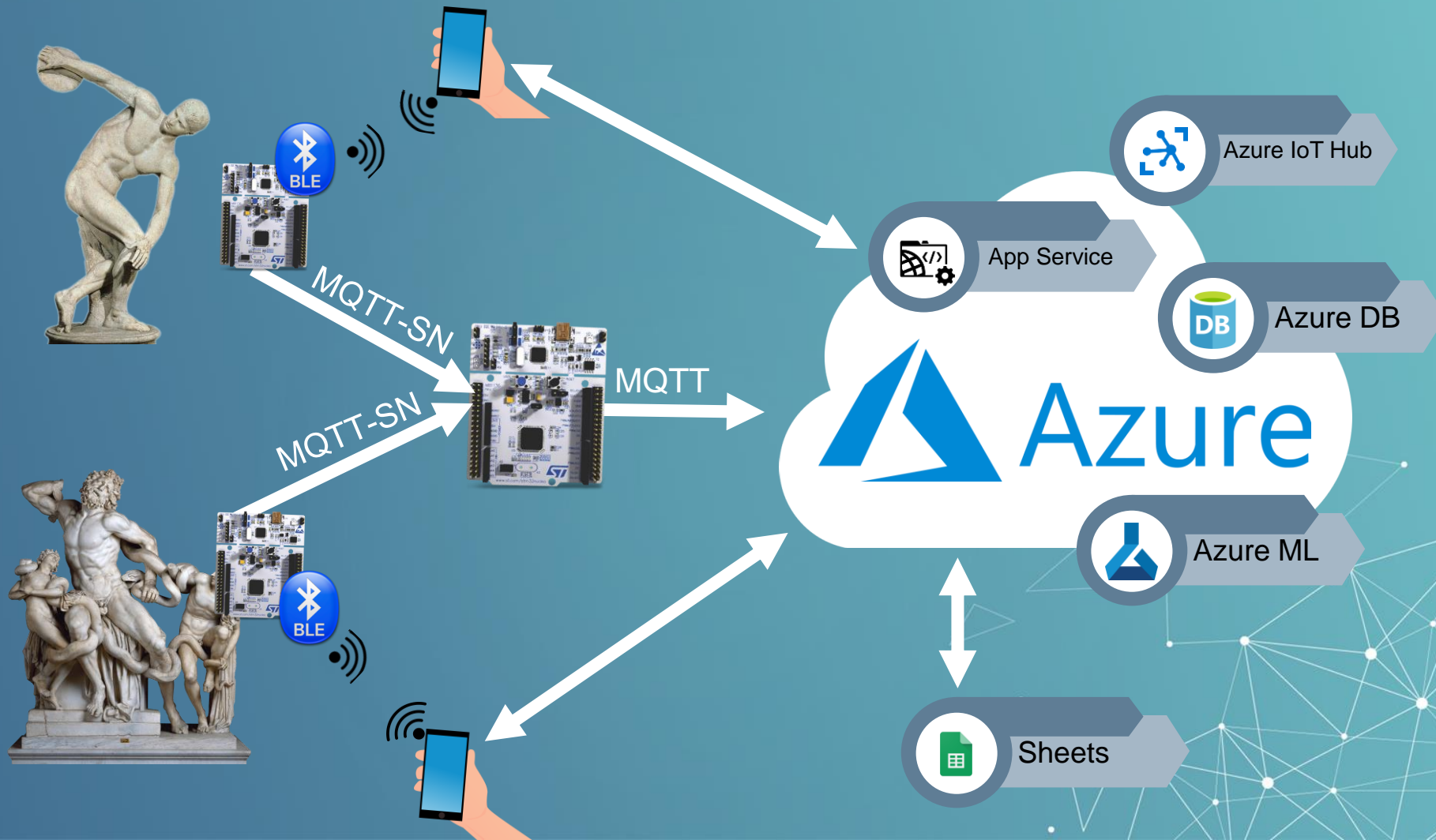
MQTT



MQTT-SN



BLE



EVALUATION





WHAT IS EVALUATION?

We define EVALUATION as the specification of parameters to establish our software's quality.

In particular, we focus on:

- **the user experience (UX)**
 - **the technologies involved**
-



The background is a solid teal color. Overlaid on this are several abstract network diagrams. These consist of white dots of varying sizes connected by thin white lines. The dots are arranged in a way that suggests a complex, interconnected system or a web of relationships. The lines are thin and white, creating a subtle pattern against the teal background. The overall aesthetic is modern and technological.

User Experience

USER EXPERIENCE

OUR USERS ARE IMPORTANT!

The users are the heart of the project: our
starting and finishing point!
We want to make sure they've had a
pleasant experience using our product.



UXEM (USER EXPERIENCE EVALUATION METHODS)

Thanks to the interaction with MuSa we can understand the visitor's mood

(for example, if he is not following the proposed tour we can assume he probably is not enjoying it).

For this purpose we suggest to use also a commercial tool like **PrEmo** that allows MuSa to know the user's feeling in real-time.

Moment method

At the end of the visit the user will be asked to fill a short survey about his experience.

This can be done using also the AttrakDiff tool.

Episode method

The background is a solid teal color. Overlaid on this are several abstract geometric patterns. On the left side, there is a dense network of white dots connected by thin white lines, forming a complex web. Scattered across the lower and right portions of the image are several white-outlined triangles of various sizes. Some of these triangles are isolated, while others are part of smaller, less complex networks of dots and lines. The overall aesthetic is clean, modern, and tech-oriented.

Technology

OVERALL EVALUATION

MuSA EVALUATION CRITERIA
APRIL 2020

Software Evaluation: Criteria-based Assessment

Criterion	Notes – to what extent is/does the software...
Understandability	Easily understood?
Documentation	Comprehensive, appropriate, well-structured user documentation?
Learnability	Easy to learn how to use its functions?
Accessibility	Evidence of current/future ability to download?
Portability	Usable on multiple platforms?
Analysability	Easy to understand at the source level?

The rest of this document covers each category in greater depth, with lists of questions that we use at the Software Sustainability Institute when compiling detailed software evaluation reports.

Understandability	Yes/No, supporting comments if warranted
How straightforward is it to understand: <ul style="list-style-type: none">What the software does and its purpose?	

We also suggest you to run security tests using one of the tools proposed in the evaluation document on the project's GitHub page.

MuSa Criteria

Software quality is defined by a set of regulations and guidelines by **ISO/IEC 9126-1**. We used a **criteria-based evaluation** which gives a measurement of quality in a number of areas, including understandability, documentation and portability. Of course, we did not use the criteria we did not need for, so we produced a lighter customized version.

SENSOR NETWORK

The board: **STM-Nucleo**

Power consumption

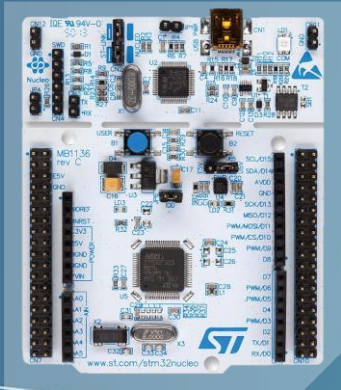
Main Aspects to Consider

Communication complexity

Scalability

- Little energy usage
- Low price (10 – 15 €)
- Widely used
- Rich documentation and examples

All these metrics can be evaluated once the project is deployed.



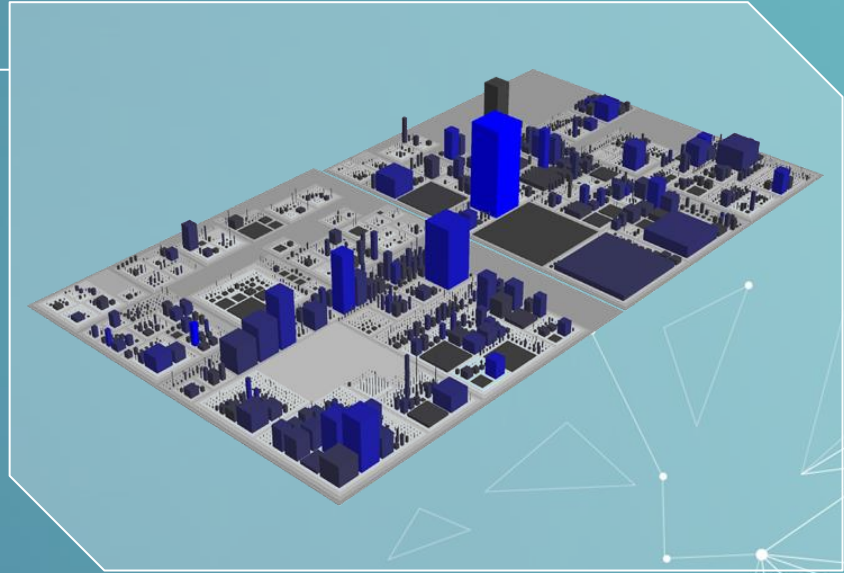
BACKEND

Code City

It is a very simple tool that allows to check the most common software metrics in a new way in which software systems are visualized as interactive, navigable 3D cities.

Classes are represented as buildings in the city, while the packages are depicted as the districts in which the buildings reside.

The more the city is well structured, the higher the code quality is.





Price



Azure IoT Hub

Free until
8000 messages/day



Azure Database

Free for
the previous Azure
Database generation
(the 4th),
few GB of space

Major drawback:
you can not have any
backup possibility



Azure App Service Plan

Free
complete solution to
deploy a full-stack
application with both FE
and BE.
1GB of storage
1GB of RAM
shared CPU

Please note that in such
a way you can not keep
your application always
running.



Azure Machine Learning

Does not offer any free
plan It starts at about
4 USD/month.



STM-Nucleo

10 – 15 €

PRICE

For further details, please have a look at [Microsoft Pricing Calculator](#).

RESOURCES

USEFUL LINKS

- **MuSa GitHub page:** <https://github.com/stefanofoti/musa>
- **Design document:** <https://github.com/stefanofoti/musa/blob/master/docs/Design.md>
- **Evaluation document:** <https://github.com/stefanofoti/musa/blob/master/docs/Evaluation.md>
- **MuSa design form:**
<https://docs.google.com/forms/d/e/1FAIpQLScHOCgfRfKwQW0pYXJSsJNKqSPaXVRaSlak9BZPZeact22I4w/viewform>
- **PrEmo:** <https://www.premotool.com/>
- **AttrakDiff:** <http://www.attrakdiff.de/index-en.html>
- **ISO/IEC 9126-1 document:** https://software.ac.uk/sites/default/files/SSI-SoftwareEvaluationCriteria.pdf?_ga=2.151004923.318823281.1587909367-13184924.1587909367

RESOURCES

USEFUL LINKS

- **MuSa criteria document:** https://github.com/stefanofoti/musa/blob/master/docs/src/evaluation/MuSa_criteria.pdf
- **Security tests:** https://owasp.org/www-community/Vulnerability_Scanning_Tools
- **Code City:** <https://wettel.github.io/codecity.html>
- **Azure App Service Link:** <https://azure.microsoft.com/it-it/pricing/details/app-service/plans/>
- **Azure IoT Hub:** <https://azure.microsoft.com/it-it/services/iot-hub/>
- **Azure Machine Learning:** <https://azure.microsoft.com/it-it/services/machine-learning/>
- **Azure Database:** <https://azure.microsoft.com/it-it/services/sql-database/>
- **Microsoft Pricing Calculator:** <https://azure.microsoft.com/it-it/pricing/calculator/>
- **Basic Plan (excel report):** https://github.com/stefanofoti/musa/blob/master/docs/src/evaluation/azure_plan.xlsx





THANKS FOR YOUR ATTENTION

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