UNIVERSIDAD POLITÉCNICA DE MADRID
GRANT: PID2022-137748OB-C31

# Project Charter

## "Digitalization As basic Driver for servitization in Industry and Basic Services" (DADIBAS)

Date: 09/12/2023
Doc. Version: 1

*<The PM² Methodology originated from the European Commission. Open PM² provides many guidelines and templates to facilitate the management and documentation of your projects.>*

**Document Control Information**

| Settings | Value |
|---|---|
| **Document Title:** | Project Charter |
| **Project Title:** | "Digitalization As basic Driver for servitization in Industry and Basic Services" (DADIBAS) |
| **Document Author:** | Joaquín Ordieres-Meré |
| **Project Owner:** | AEI |
| **Project Manager:** | Joaquín Ordieres-Meré |
| **Doc. Version:** | 1 |
| **Sensitivity:** | Public |
| **Date:** | 09/12/2023 |

**Document Approver(s) and Reviewer(s):**

NOTE: All Approvers are required. Records of each approver must be maintained.

All reviewers in the list are considered required unless explicitly listed as Optional.

| Name | Role | Action | Date |
|---|---|---|---|
| Ramiro García Galán | SP | *Review* | |
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| | | | |

**Document history:**

The Document Author is authorized to make the following types of changes to the document without requiring that the document be re-approved:

- Editorial, formatting, and spelling
- Clarification

To request a change to this document, contact the Document Author.

Changes to this document are summarized in the following table in reverse chronological order (latest version first).

| Revision | Date | Created by | Short Description of Changes |
|---|---|---|---|
| 1.1 | 09/12/2023 | Joaquín Ordieres-Meré | First version of the Project Charter |
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| | | | |

**Configuration Management: Document Location**

The latest version of this controlled document is stored in the OneDrive repository of the project.

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# 1 EXECUTIVE SUMMARY

*The goal of this project is to stablish the foundation of a successful project, offering clarity and direction to the team and ensuring everyone is on the same page. When starting a new project, it is essential to have a clear plan in place to ensure success. That is where a project charter comes in.*

*As a project timeline reference document, the project charter is there to help you navigate issues that arise proactively. In a sense, it is to the project manager what a blueprint is to an architect. The project charter is a high-level strategic overview that seeks to lay out the terms of the project, along with other key details such as relevant stakeholder information. It provides the parameters within which your team must operate for the project to be a success.*

*The project charter typically documents the following parts of the project:*

- *Project objectives and constraints.*
- *Key stakeholders.*
- *Risks identified.*
- *Benefits of the project.*
- *General overview of the budget.*

# 2 CONSIDERATIONS ON THE BUSINESS CASE

*The goal of this document is not to repeat the considerations of the Business Case (BsC) but just to highlight the main aspects, in such a way that the full project proposal can be aligned towards it.*

*The asset management industry is facing pressure from investors and regulators to prioritize value for money and sustainable finance, while also dealing with decreased fees due to fierce competition. This is taking place as the industry tries to regain lost revenues and navigate post-pandemic sociopolitical challenges. If asset managers can realign their strategy to prioritize their clients and use advanced technology, they will be successful in the future.*

*In such a context the need for comprehensive reference frameworks is evident, although some have already been proposed, such as Digital Twins (DT), Cognitive Digital Twins (CDT), Building Information Modelling (BIM), and RAMI 4.0 for industry 4.0. In most of the cases they look rather isolated solutions and for new problems or implementations. However, the transition towards smart manufacturing is challenging for companies with a considerable installed base of legacy machines and equipment. In this regard, smart retrofitting (SR) has been introduced as a sustainable approach of transforming the current state of legacy equipment into smart and connected assets. By equipping the existing installed base with hardware and software as well as networking capability, smart retrofitting allows for new data-driven processes and business models.*

# 3 PROJECT DESCRIPTION

## 3.1 Scope

### 3.1.1 Includes ("IN" Scope)

*The architecture of the project involves contributions from three different axes.*

*a) Process improvements related to assets.*

*b) Integration of the human dimension from the safety, the health and the impact on the processes need to be considered.*

*c) Integration in the BIM use case, as a solid context to consider the asset, the processes and the human actors involved together.*

### 3.1.2 Excludes ("OUT" Scope)

*The uses cases to be selected will explicitly avoid the integrated setup of the hardware context, although contributions on the side of the Internet of the Things (IoT) can be explicitly considered. However, main contexts must be in place, in order to keep under control, the required effort as well as the time required.*

*To this end, it will be strategic to find appropriate partners able to explore the possibilities of the technology to make stronger contribution to the value creation, according to the existing processes.*

### 3.1.3 Scope Statement

*It is expected from the project:*

- *To develop methodologies for the management of the components (digital twin, data management, model management, agent management) in a flexible context such as microservices.*
- *To verify and validate statistical learning models adjusted to empirical data obtained from assets and operating processes.*
- *To explore servitization strategies based on the results and findings related to the other objectives, according to the proposed framework, considering the required transparency levels. It will specifically look at the integrated maintenance and operation schemas, which is a clear bottleneck to overcome.*
- *To integrate environmental factors and energy-related aspects in the description of the processes linked to assets, making them aware of such elements.*
- *To integrate the principles of circular economy in the semantic description of assets, since they can influence maintenance policies, or asset usage strategies.*

## 3.2 Success Criteria

*Results and outputs, using the following dissemination channels will be prioritised:*

- *Scientific publications (> 15 papers)*
- *Conferences and workshops (1 workshop)*
- *International events (> 20 international conference contributions)*
- *Collaboration and synergies with other projects (actively promoted)*

*Specifically, the dissemination strategy must include a communication one, which will rely on KPIs, and the initial proposal to start the definition will be,*

| ***Communication Activity*** | ***Target KPI*** |
|---|---|
| *Creation of light content for non-specialized audience in the channels adopted in this task, as well as contributing to "lighter" versions of project newsletters, leaflets, flyers, etc* | *> 50 visitors in non-specialized area* |
| *Contribute to Exhibitions / workshops with free access, where visitors will have the possibility to realize in a lively way the DIGEST benefits. For example, visitors will have the opportunity to explore how technology contributes to different use cases.* | *1 exhibitions/ workshops*<br>*> 50 non-specialized attendees* |
| *DIGEST recognition: will elaborate on building the DIGEST "image" to the external world brand with a logo, a motto, and design/template following its ubiquitous appearance. Harmonized design and templates will adorn the project website, flyers, reports, videos, presentations, and any dissemination or communication activity.* | *> 50 responders identified DIGEST* |

| | |
|---|---|
| *Promotion of the DIGEST activities and benefits to the public will be conducted in cooperation with local authorities/institutions, also covered by local media (e.g. broadcasters, papers, magazines)* | *> 1 event*<br>*> 3 appearances to local media* |

## 3.3 Stakeholder and User Needs

*The major stakeholders, except the Solution Provider (SP) are those supporting the project through the use cases. Therefore, these stakeholders will be in connection with the use cases adopted in close connection with the categories mentioned in section 3.1.1*

*The common user needs from all the stakeholders are to increase the integration between the assets themselves with their usage, maintenance and operation conditions as par of the same process of value protection and value creation.*

*Aging infrastructure and increasingly sophisticated demands from regulators and other stakeholders are creating a perfect storm, which is placing conventional maintenance and capital planning practices under pressure.*

*Many utilities are looking to asset management best practices, most notably the **ISO 55000** standard. The essence of this standard is value realization from assets—ensuring that the right things are being done right, and that these activities support your organization's strategic objectives.*

*Work-execution-management planning and condition-based maintenance are getting a lot of attention these days — as well they should. The internet of things combined with big data analytics and artificial intelligence are enabling supply chain professionals to focus on what will or might happen, rather than firefighting machine failures. It has never been easier to establish failure modes before they manifest as downtime.*

*A good maintenance strategy lays out when mandatory and preventive maintenance will be scheduled and suggests how resources should be deployed to identify failure modes and when interventions must be taken to maintain uptime. Ensuring that your maintenance strategy is attainable means having the skills, tools and asset availability to execute planned work in a timely manner. It also requires availability of the right parts and supplies. This is where maintenance meets supply chain — and integrated asset management is born.*

*But getting the right parts and supplies where and when they're needed is more complicated than it sounds. It demands,*

- *parts and supplies that are clearly identified and described.*
- *easily accessible components stored in such a way that they won't disappear, deteriorate or get damaged.*
- *inventories that can be deployed close enough to point-of-use to be available when required, yet managed centrally to minimize administrative costs and leverage stocking synergies.*
- *predictable, inexpensive deliveries that get supply where and when it is required.*
- *reasonable prices to drive longer asset life with an overall low cost of ownership.*

*Not long ago, many companies designed their own solutions to these challenges. They built maintenance shops with warehouses, then filled them with highly trained and equipped technicians, tools, testing equipment and inventories. Companies would keep their relationships with equipment suppliers at an arms length, which drove them to buy the recommended critical spares and subsequent original equipment manufacturer (OEM) parts to maintain their warranties.*

*These businesses worked with specialized distributors for consumables and other parts. They managed their own inventories, determined how and when deliveries would occur, and incurred extra costs when expedited deliveries were required. They leveraged their buying power with each of these players, who built in extra profit to the prices so they could "give back" in power-based negotiations. The ensuing ecosystems were nicely profitable despite high inventories and material handling costs.*

*Today, operating models are driving a greater service component into OEM and distributor capabilities. Inventory is consigned or held further up the supply chain, where several customers can be protected with the same slow-moving critical parts and modules. Parts and supplies are being kitted to each major*

*maintenance task, then sent back to be topped up. On-site storerooms are staffed by distributor personnel. Repair shops are staffed by OEM technicians. Commercial models are emerging through which customers only pay for equipment when it is available in a sort of Product Service System (PSS) approach. These new models dramatically change the nature of the commercial relationship via a more complex sharing of tasks, responsibilities and risks. As we advance maintenance practices and leverage advances in technology and thinking, we must change the way we think about the supporting supply chain.*

*The role played by suppliers and the terms of engagement we employ will play an increasingly important role in determining the success of our integrated asset management strategy. This is dramatically changing the nature of supplier relationships and placing new challenges on how maintenance and supply chain managers work with suppliers. Getting things done through independent third parties will be a crucial challenge. Both maintenance and supply chain managers must adapt to these new realities.*

*As new business models emerge in integrated asset management, both suppliers and buyers are stretching the traditional transactional model. Becoming more collaborative to drive real competitive-differentiating innovation is imperative. To fully develop this trend, a comprehensive framework must be in place as a critical interest for all the participants in the project.*

## 3.4 Deliverables

*Project Deliverables are of three main categories:*

a) *Internal Deliverables*

*They have been organized as per WP:*

*D1.1 .- Project Business Case*
*D1.2 .- Project charter*
*D1.3 .- Project Workplan*
*D1.4 .- Project Final report*
*D2.1 .- Use case description: Challenges & technological requirements*
*D2.2 .- Digital models and process improvement*
*D2.3 .- Dissemination report and KPIs*
*D3.1 .- Wearables and digital solutions for context enrichment in predictive models.*
*D3.2 .- Data Integration, Interoperability, and Communication without contact.*
*D2.3 .- Dissemination report and KPIs*
*D4.1 .- Use case description: Challenges & technological requirements*
*D4.2 .- Digital models (BIM and operational models) and process improvement*
*D4.3 .- Dissemination report and KPIs*

b) *Technical Dissemination*

*At least 15 JCR journal papers and 20 conference contributions.*

c) *Social Dissemination*

*1 Workshop involving companies.*

*Brand image for the project and web-page.*

*Regular newsletters (every six months) and social media dissemination on monthly bases.*

## 3.5 Constraints

*The IT infrastructure in use will be brough by the SP as part of their contribution to the project, but it will be limited to the usage inside the boundaries of the project. Therefore, if any of the industries participating in the project through the use cases, they will need to develop their own infrastructure. Support from the project team can be obtained when specific agreements are developed.*

*In specific cases, because of the potential IPRs, delays in publication can be acceptable meanwhile the protection process is on-going.*

## 3.6 Assumptions

*The main use cases may be subdivided into elementary cases capable of better structuring the context, data capture or process modelling, and in specific cases, these elementary use cases may belong to other different technological areas. This is particularly evident when the human integration is considered, because the process of collecting data from wearable devices can be applied to multiple applications, including those related to health.*

## 3.7 Risks

*During the setting up the Project Charter, the initial Risk Register is populated with the following items.*

| ID | Risk Description & Details | Status | Likelihood[1] | Impact[2] | Risk Level[3] | Risk Owner | Risk Response Strategy[4] | Action Details |
|---|---|---|---|---|---|---|---|---|
| *SC1* | *Unable to find suitable use cases* | *Active* | *L* | *H* | *M* | *MOM* | *Mitigation* | *Work out several UCs in parallel* |
| *RE1* | *Researcher withdrawal* | *Active* | *L* | *M* | *L* | *AUC* | *Avoidance* | *Run Tasks with more than one resource* |
| *EX1* | *Difficulties to model behaviours* | *Active* | *M* | *M* | *M* | *JOM* | *Mitigation* | *Develop a live infrastructure to gather more data* |
| *EX2* | *Difficulties to build frameworks* | *Active* | *M* | *H* | *H* | *JOM* | *Reduce* | *Due to the accumulated experience and knowledge in the research team, increasing cooperation will bring additional ideas.* |
| *DI1* | *Lower paper production than expected* | *Active* | *L* | *M* | *L* | *JOM* | *Reduce* | *Additional effort from research team. Cross-cooperation between subproject researchers will be mobilised for specific papers.* |
| *EX3* | *HPC resources fully booked* | *Active* | *L* | *M* | *L* | *RRR* | *Mitigation* | *Use alternative resources from the RES network (Spanish Supercomputing Network)* |

# 4 TIMING AND RESOURCES

## 4.1 Timing and Milestones

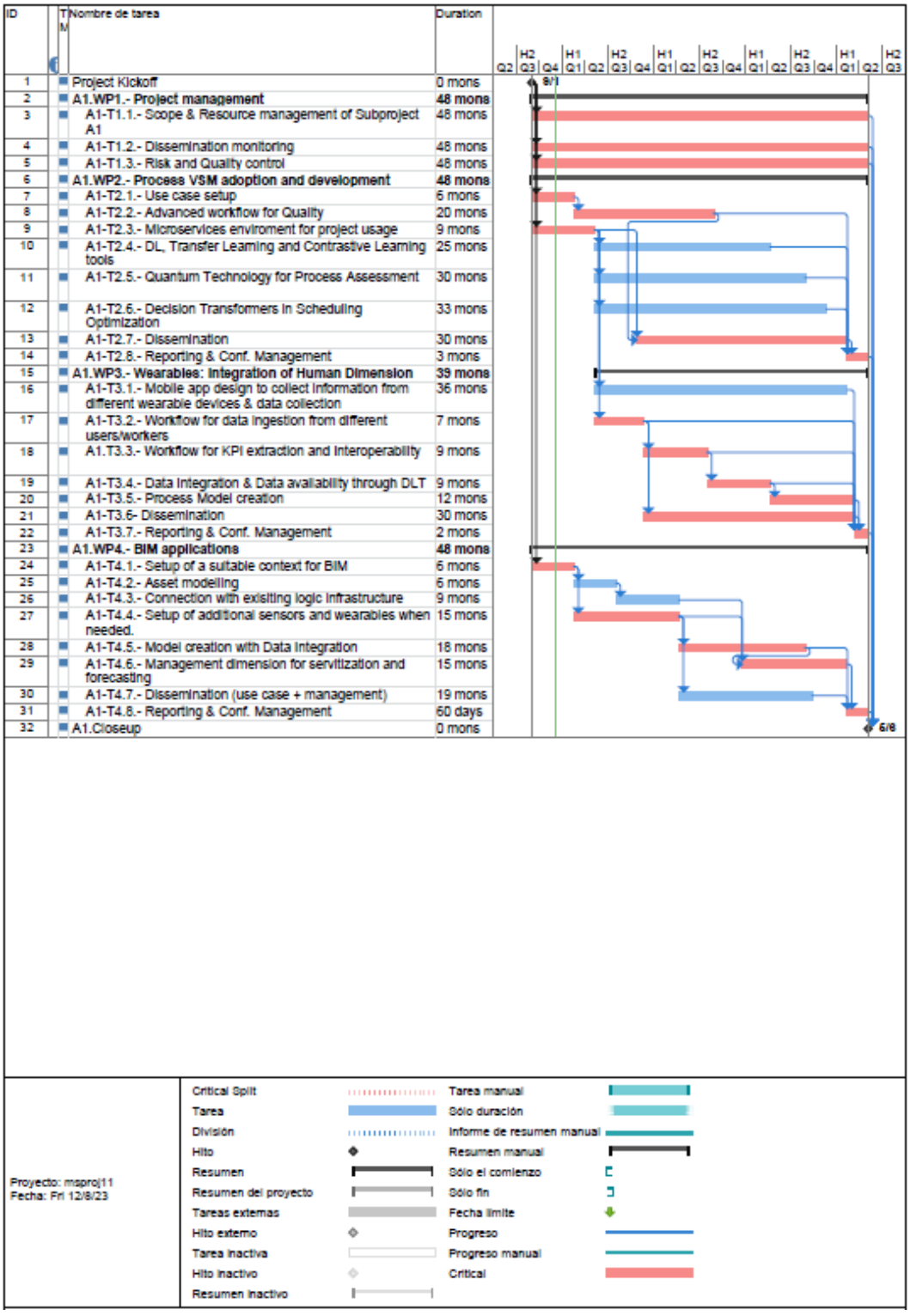
*The list of milestones is presented in the following table,*

| ID | MILESTONE | TARGET DELIVERY DATE | RELATIVE OFFSET |
|---|---|---|---|
| *1* | *Project Business Case* | *31/12/23* | *M3* |
| *2* | *Project Charter* | *31/01/24* | *M4* |
| *3* | *Project Workplan* | *30/04/24* | *M6* |

[1] A numeric value denoting the relative probability that the risk should occur.
[2] A numeric value denoting the relative severity of the impact of the risk if it should occur.
[3] The risk level is the product of the likelihood and impact (RL=L*I).
[4] The possible risk response strategies are: Avoid / Accept / Reduce / Transfer for negative risks (threats) and Exploit / Accept / Enhance / Share for positive risks (opportunities).

| | | | |
|---|---|---|---|
| *4* | *Use Case of WP2* | *30/05/24* | *M9* |
| *5* | *Use Case of WP3* | *30/06/24* | *M10* |
| *6* | *Wearable & digital solutions* | *30/08/25* | *M24* |
| *7* | *Data Integration, Interoperability and Communication* | *28/02/26* | *M30* |
| *8* | *Digital Models from WP3* | *28/02/27* | *M42* |
| *9* | *BIM digital Models* | *30/05/27* | *M45* |
| *10* | *End of the Project* | *30/08/27* | *M48* |

*The list of tasks is presented in the following graph,*



## 4.2 Planned Resources

*The resources allocated to the project are:*

| Resource Name | Acronym | Focus | Engagement |
|---|---|---|---|
| *Joaquín Ordieres Meré* | *JOM* | *RT* | *100,00 %* |
| *Miguel Ortega Mier* | *MOM* | *RT* | *100,00 %* |
| *Antonia Pacios Álvarez* | *APA* | *RT* | *50,00 %* |
| *Angel Paris Loreiro* | *APL* | *RT* | *100,00 %* |
| *Miguel Gutiérrez Fernández* | *MGF* | *RT* | *100,00 %* |
| *Álvaro García Sánchez* | *AGS* | *RT* | *50,00 %* |
| *Sergio Rios Aguilar* | *SRA* | *RT* | *50,00 %* |
| *Ángel Uruburu Colsa* | *AUC* | *RT* | *100,00 %* |
| *Rocío Rodríguez Rivero* | *RRR* | *WT* | *100,00 %* |
| *Elcio Mendoça Tachizawa* | *EMT* | *RT* | *100,00 %* |
| *Jorge Pablo Díaz Velilla* | *JDV* | *RT* | *100,00 %* |
| *Javier Villalba Díez* | *JVD* | *WT* | *100,00 %* |
| *Ramiro García Galán* | *RGG* | *WT* | *100,00 %* |

# 5 APPROACH

## 5.1 Methodology

From a top-level view, it will be an 'action' methodology because it is characterised by "Research strategies that tackle real-world problems in participatory, collaborative and cyclical ways to produce both knowledge and action." Since all subprojects have use cases driven by real-world problems and are going to be addressed in collaborative and somehow cyclical ways, it is the preferred one, and the key elements will be considered for tasks dealing with such real problems.
The general policies adopted in the DIGEST project, as well as the daily management operations of the subprojects, will be carried out by adapting the $PM^2$ project management methodology, developed and endorsed by the European Commission. To this end, the $PM^2$ promoted templates will be adopted and customized.
The WPs that deal with modelling will follow the CRISP/DM methodology to follow the creation and validation, and the integrated tasks will select the development strategy that is better suited to them ($PM^2$, Scrum, Kanban, etc.) where the subproject team will have the ability to choose the most appropriate approach, considering the context and constraints.
To this end, the tasks linked to WP1 will follow the $PM^2$ method, while each use case will setup its own methodology.

## 5.2 Change Management

*The project change management process defines the activities related to identifying, documenting, assessing, approving, prioritising, planning and controlling changes, and communicating them to all relevant stakeholders. It is a five-step process that the Project Manager (PM) executes whenever required throughout the project lifecycle:*

*Change Identification: a request for a change can be submitted formally via a Change Request Form, or can be identified and raised during meetings as a result of decisions, issues or risks. The Change Log contains information to identify the change, such as the requestor, a short description, identification date, etc.*

*Change Assessment and Action Recommendation: the size and impact of the change on the project scope, schedule, cost, quality, risk, and other project boundaries is assessed, where after a recommended action will be documented by the Project Manager (PM) in the Change Log., This information is then used as an input to the formal change approval by the appropriate decision makers.*

*Change Approval: the approval of a project change will follow the defined escalation process for this project. For changes which do not have significant impact on delivery time and budget, the changes can be approved during the Project Status Meetings. Other changes (having a size L or XL) are approved by the Project Steering Committee (PSC),* ***which in this case is under the responsibility of the Management Board (MB).*** *The decision details are documented in the Change Log.*

*Change Implementation: the activities related to the implementation of approved changes will be documented in the Project Work Plan.*

*Change Control: new or open changes will be identified/reassessed weekly during the Project Status Meetings and the Project Manager (PM) will then update the Change Log with the results of the analysis/review. For the Medium, High and Very High size changes, the Project Manager (PM) will report on a three-monthly basis their status to the Project Steering Committee (MB) and, when adequate, to other project stakeholders.*

### 5.2.1 Configuration Management

*The project configuration management procedure comprises the identification of project configuration items (CIs), their attributes and status codes, the establishment of baselines, the definition of roles and responsibilities for authorised changes to CIs, and the maintenance and control of a project repository.*

#### *5.2.1.1 Storage of project management artefacts*

*The Project Manager (PM) will structure the project management artefacts per PM2 phase, following the below folder convention:*

*01 Former versions*
*02 Current versions*
*03 Draft*

#### *5.2.1.2 Naming convention of project management artefacts*

*The following artefact naming convention will be used:*

***(DocumentName).DADIBAS.(yyyy-mm-dd).v(x.x),*** *where:*

- *Document name refers to the purpose of it (Business Case, Project Charter, etc.*
- *v(x.x) indicates the artefact version. Version numbers like "0.x" mean that the document hasn't been approved yet; minor changes will be reflected in the decimal (revisions number) and major changes (formal reviews) in the version number.*

#### *5.2.1.3 Versioning of project management artefacts*

*All project management artefacts are under version control, except for the project logs and checklists, when used.*

### 5.2.2 Organisational Change

*The impact of the changes facilitated by the project can be significant in the case of PSS development, which means the need for skilling up the affected workers. Therefore, involved management dimensions will be under consideration as well. Similar situations will happen with the Smart Retrofitting and human integration in processes, where updated workflows can impact current KPIs.*

# 6 GOVERNANCE AND STAKEHOLDERS

## 6.1 Structure

*The direct nominated PO is the Spanish "Agencia Estatal de Investigación" as the agency providing support for the project.*

A joint governing structure will be implemented to harmonise the activities of the researchers on an individual level and efficiently achieve the expected DIGEST objectives. The project management structure involves the roles a) Project Coordinator, b) Project Assistant, d) Training Coordinator, and f) Work Package Leader. These appointed people will function under the supervision and management of the following project bodies:

- **The Management Board (MB),** for the whole DIGEST project, composed of the Project Coordinators of the subprojects responsible for resolving and monitoring the project progress as well as monitoring the contributions, and responsible for monitoring the success and the impact of the project, and potentially a Project Assistant. The Project Coordinator of Subproject A1 is mandatory in charge of operating the link between DIGEST consortium members and the Agencia Estatal de Investigación (AEI) of the Spanish Minister of Science and Innovation. It will be responsible for monitoring and supporting the SC and the SB. All financial issues are excluded from the duties of this committee because the AEI is funding each university independently. In case of the absence of the project coordinator in charge, the role will be taken by the second project coordinator, which is an enforced position in all the subprojects. Annual project meetings will be scheduled at different places, looking to align them with WorkShops or other relevant events.
- **The Steering Committee (SC),** at the subproject level chaired by the subproject coordinators of the subproject and including all WP leaders, the Project Assistant and the Training Coordinator. The SC will monitor both the progress of the WPs and the research training programme, looking to maximise the links between the research and the training activities or challenges. The monitoring duties of SC include both academic and non-academic aspects, such as ethics, IPR, gender mainstreaming, public outreach, data policy, and management, as well as financial and administrative matters. To this aim, each of these responsibilities will be assigned to one of the SC members. At least one SC meeting will be organised every six months, while running them in parallel with other subproject activities, such as network workshops and annual meetings, would be considered.
  The SC as per subproject will take the responsibility for the subproject configuration of Deliverables, including reports, code repositories, and any other digital element. It will verify that the policies on open access are met. Formal and informal cooperation between SC managers is not only expected but promoted.
- **The Supervisory Board (SB),** is chaired by an annually elected representative and is cochaired by a member of the RT from each subproject, appointed by the Subproject coordinator. Cooperation between SB and SC will facilitate the advice on the management, scientific, and training angles of the programme. It will advise young researchers (YRs) on their progress, the expected, and obtained results throughout the programme and counsel them about their career plans. Doing it from the Project fosters their interaction and allows YRs to learn from distinct cultural approaches or practises.

## 6.2 Other Stakeholders

*Additional direct stakeholders will be the organizations involved within the use cases, and indirectly the industries behind these use cases.*

*Finally, the whole society because the BIM can easily touch the real state owners.*

# APPENDIX 1: REFERENCES AND RELATED DOCUMENTS

*Use this section to reference any relevant or additional information. Specify each reference or related document by title, version (if applicable), date, and source (e.g. the location of the document or the publishing organisation).*

| ID | Reference or Related Document | Source or Link/Location |
|---|---|---|
| 1 | *Business Case Document* | |
| 2 | *Project Charter* | |