



# Graha Research

Research Internship · 18-Week Gantt Project Plan

## Digital Product Passport Platform

Implement a Digital Product Passport (DPP) platform for connected-vehicle components that captures lifecycle, material and circularity data in an interoperable, data-sovereign data-space architecture.

**18**

Weeks

**6**

Planning Clusters

**1**

Thesis / Collaboration

# Research Internship

## Four 18-week Gantt Project Plans for thesis and research collaboration

Graha International GmbH offers four structured research internships, each delivered as an 18-week Gantt Project Plan organised into six best-practice planning clusters. This document details the internship highlighted below.

<p><b>INTERNSHIP 01</b></p> <p><b>Predictive Maintenance Platform</b></p> <p>Design and prototype a predictive-maintenance platform for connected vehicles that combines multivariate time-series modelling, causal AI and explainable remaining-useful-life estimation.</p>	<p><b>INTERNSHIP 02</b></p> <p><b>ESG Platform with GraphRAG</b></p> <p>Build an Environmental, Social and Governance (ESG) analytics platform that uses a Knowledge Graph and Retrieval-Augmented Generation (GraphRAG) to turn fragmented sustainability data into explainable, auditable ESG insights.</p>	<p><b>INTERNSHIP 03</b></p> <p><b>Digital Product Passport Platform</b></p> <p>Implement a Digital Product Passport (DPP) platform for connected-vehicle components that captures lifecycle, material and circularity data in an interoperable, data-sovereign data-space architecture.</p>	<p><b>INTERNSHIP 04</b></p> <p><b>Digital Twin Platform</b></p> <p>Develop a Digital Twin platform that mirrors onboard vehicle systems in real time, fusing sensor telemetry with physics- and data-driven models for simulation, monitoring and what-if analysis.</p>
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## This document, Digital Product Passport Platform

*Implement a Digital Product Passport (DPP) platform for connected-vehicle components that captures lifecycle, material and circularity data in an interoperable, data-sovereign data-space architecture.*

# Our Research Plan

## Digital Product Passport Platform · 18-Week Gantt Project Plan

### Overview

This internship contributes to Graha International's research on data spaces and the circular economy. The intern designs and prototypes a Digital Product Passport (DPP) platform that records the lifecycle, material composition and circularity attributes of connected-vehicle components and makes them securely shareable across the value chain.

Structured as an 18-week Gantt Project Plan, the work is suitable as the practical basis for a Bachelor's or Master's thesis or a research collaboration. It emphasises interoperability, data sovereignty and alignment with emerging Digital Product Passport regulation.

### Objectives

- Model product-passport data: identity, materials, lifecycle events and circularity attributes.
- Design an interoperable DPP data model aligned with relevant standards and regulation.
- Implement secure, data-sovereign sharing of passport data across value-chain actors.
- Provide passport access through a verifiable identifier and a clear user view.
- Evaluate interoperability, data integrity and access control of the platform.

### Candidate Profile

- Studies in Computer Science, Information Systems, Industrial Engineering or a related field.
- Solid programming skills; interest in APIs, data modelling and distributed systems.
- Basic understanding of data spaces, identifiers and access control.
- Interest in sustainability, the circular economy and regulatory-driven systems.
- Independent, structured working style and good scientific-writing skills.

### 18-Week Gantt Project Plan

The plan is organised into six best-practice planning clusters spanning 18 weeks. Each cluster states its focus, key activities and a milestone that must be reached before the next cluster begins.

**WEEKS 1-3****Cluster 1 - Onboarding & Foundations**

Settle in, set up the working environment, and agree the detailed plan and success criteria with the academic and industrial supervisors.

**KEY ACTIVITIES**

- Onboarding at Graha International: tooling, data-governance and NDA briefing.
- Familiarisation with Digital Product Passport concepts, data spaces and the circular economy.
- Set up a reproducible environment: version control, experiment tracking and a containerised workspace.
- Refine scope, success criteria and the detailed 18-week work plan with the supervisor.

**Milestone,** Approved internship work plan and a running, reproducible development environment.

**WEEKS 4-6****Cluster 2 - Literature Review & Requirements**

Build the scientific foundation through a structured literature review and a precise requirements and evaluation specification.

**KEY ACTIVITIES**

- Structured literature review on Digital Product Passports and circular-economy data.
- Survey of DPP regulation, identifier schemes and data-space standards.
- Stakeholder and requirements analysis; definition of the core use cases and KPIs.
- Draft the conceptual approach and the evaluation methodology with metrics and baselines.

**Milestone,** Literature-review report and an agreed requirements and evaluation plan.

**WEEKS 7-9****Cluster 3 - Data Engineering & System Architecture**

Prepare the data assets and design the interoperable, data-sovereign architecture.

**KEY ACTIVITIES**

- Define the DPP data model: identity, materials, lifecycle events and circularity attributes.
- Map the data model to relevant interoperability standards.
- Design the platform architecture: passport store, data-space connector, API and access layers.

- Specify the verifiable identifier scheme and the data-sharing interfaces.

**Milestone**, Architecture design document and an interoperable DPP data model.

#### WEEKS 10-13

### Cluster 4 - Implementation & Modelling

Implement the DPP platform and the secure data-sharing components.

#### KEY ACTIVITIES

- Implement the passport store and the lifecycle-event ingestion services.
- Build the data-space connector for sovereign, policy-controlled data exchange.
- Implement access control and a verifiable-identifier resolution service.
- Build the passport view that presents lifecycle and circularity data to users.

**Milestone**, Working DPP-platform prototype covering the core passport-sharing use case.

#### WEEKS 14-16

### Cluster 5 - Evaluation, Validation & Hardening

Evaluate, validate and harden the prototype with a focus on interoperability.

#### KEY ACTIVITIES

- Define and run experiments on interoperability, data integrity and access control.
- Validate passport exchange against the agreed standards and use cases.
- Assess robustness and security of the sovereign data-sharing flow.
- Iterate on the data model and the connectors based on the findings.

**Milestone**, Evaluation report with quantitative results and a validated, hardened prototype.

#### WEEKS 17-18

### Cluster 6 - Documentation, Thesis & Final Defence

Consolidate the documentation, draft the thesis material and present the results.

#### KEY ACTIVITIES

- Consolidate code, documentation and reproducibility instructions.
- Write the thesis-ready report covering method, results and limitations.

- Prepare and deliver the final presentation and a live demo.
- Hand over the platform, the data model and the backlog of future work to Graha.

**Milestone,** Final thesis-ready report, final presentation and a complete handover package.

## Expected Outcomes

- A reproducible, documented Digital Product Passport platform prototype.
- An interoperable, standards-aligned DPP data model.
- A data-sovereign passport-sharing component with access control.
- A thesis-ready scientific report on interoperable product passports.

## Project Timeline (Gantt Chart)

The 18-week plan visualised as a Gantt chart across Week 1 to Week 18.

## 18-Week Project Timeline

Six best-practice planning clusters across Week 1 to Week 18

PLANNING CLUSTER	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
<b>C1</b> Onboarding & Foundations Weeks 1 to 3	W1-3																	
<b>C2</b> Literature Review & Requirements Weeks 4 to 6				W4-6														
<b>C3</b> Data Engineering & System Architecture Weeks 7 to 9							W7-9											
<b>C4</b> Implementation & Modelling Weeks 10 to 13										W10-13								
<b>C5</b> Evaluation, Validation & Hardening Weeks 14 to 16													W14-16					
<b>C6</b> Documentation, Thesis & Defence Weeks 17 to 18																	W17-18	

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