

Project handbook  
**Smart-Wand**  
**1**

Version 3  
Project manager: Thomas

Date: 2/12/25

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# Document versions

Versionno.	Date	Change	Author
<b>1</b>	17.11.2025	Initial Entries	Toferer
2	1.12.2025	Finalising initial Entries	Durkowitsch
2.5	1.12.2025	Creating Project Environment Analysis	Codoban
3	2.12.2025	Finishing the Parts for Project Handbook Part 1 up to 1.10	Toferer, Durkowitsch



# 1 Project plans

## 1.1 Project Assignment

Smart-Wand 1			PROJECT- ASSIGNMENT																	
<b>Project start event:</b> <ul style="list-style-type: none"> <li>2.12.2025</li> </ul>			<b>Project start date:</b> <ul style="list-style-type: none"> <li>3.12.2025</li> </ul>																	
<b>project close down event in terms of content:</b> <ul style="list-style-type: none"> <li>End of Mai</li> </ul> <b>Formal project close down event:</b> <ul style="list-style-type: none"> <li>End of Mai</li> </ul>			<b>Project close down dates:</b> <ul style="list-style-type: none"> <li>End of Mai</li> </ul>																	
<b>Project objectives:</b> <ul style="list-style-type: none"> <li>Creating useable Wand for Smart Devices</li> <li>send commands to Home Assistant</li> <li>Distinguish different Spells by Movement</li> </ul>			<b>Non-objectives:</b> <ul style="list-style-type: none"> <li>Expanding support for other Smart-Home management Systems (Google Home, Loxone etc)</li> <li>Lifetime Support</li> <li>Further Development</li> </ul>																	
<b>Main tasks (Project phases):</b> <ul style="list-style-type: none"> <li>Detecting Spells (Gyro, Acceleration)</li> <li>Send commands to Home-Assist</li> <li>Refine spell detection</li> </ul>			<b>Project resources and costs*:</b> <table border="1"> <thead> <tr> <th>resource/type of cost</th> <th>unit</th> <th>Costs (€)</th> </tr> </thead> <tbody> <tr> <td>ESP 32</td> <td>1</td> <td>7€</td> </tr> <tr> <td>RaspberryPi 5</td> <td>1</td> <td>75€</td> </tr> <tr> <td>MPU6050</td> <td>1</td> <td>7,55€</td> </tr> <tr> <td>Shelly Plug</td> <td>1</td> <td>23,8€</td> </tr> </tbody> </table>			resource/type of cost	unit	Costs (€)	ESP 32	1	7€	RaspberryPi 5	1	75€	MPU6050	1	7,55€	Shelly Plug	1	23,8€
resource/type of cost	unit	Costs (€)																		
ESP 32	1	7€																		
RaspberryPi 5	1	75€																		
MPU6050	1	7,55€																		
Shelly Plug	1	23,8€																		
<b>Project owner:</b> <ul style="list-style-type: none"> <li>HTL-Wels</li> </ul>			<b>Project manager:</b> <ul style="list-style-type: none"> <li>Toferer Thomas</li> </ul>																	
<b>Project team members:</b> <ul style="list-style-type: none"> <li>Codoban Simon</li> <li>Durkowitsch Laurenz</li> </ul>																				
HTL Wels..... (Project owner)			Toferer Thomas..... (Project manager)																	

\* Possible categories of total Project budget:

Category A: cover of the shelly module

Category B: full cover of equipment

## 1.2 Project Objectives (objectives, non-objectives)

<div>Smart Wand</div> <div>1</div> <div>PROJECT OBJECTIVES</div>		
Type of objective	Project objectives	Adjusted project objectives as of...
<b>objectives:</b> <ul style="list-style-type: none"> <li><b>Main objectives</b></li> <li><b>Additional objectives</b></li> </ul>	<ul style="list-style-type: none"> <li>Detect multiple Spells</li> <li>Communicate with Home-Assist</li> <li><b>Create a reliable and nice experience using the device</b></li> <li><b>Add Support for another microcontroller</b></li> <li><b>Web interface to manage Spells</b></li> </ul>	
<b>Non-objectives</b>	<ul style="list-style-type: none"> <li><b>Add Support for other IOT Management Solutions</b></li> <li><b>Offer Lifetime Support</b></li> <li><b>Further Developement</b></li> </ul>	<ul style="list-style-type: none"> <li>If there is enough time left before end of mai this objective could be transformed into an additional object.</li> </ul>

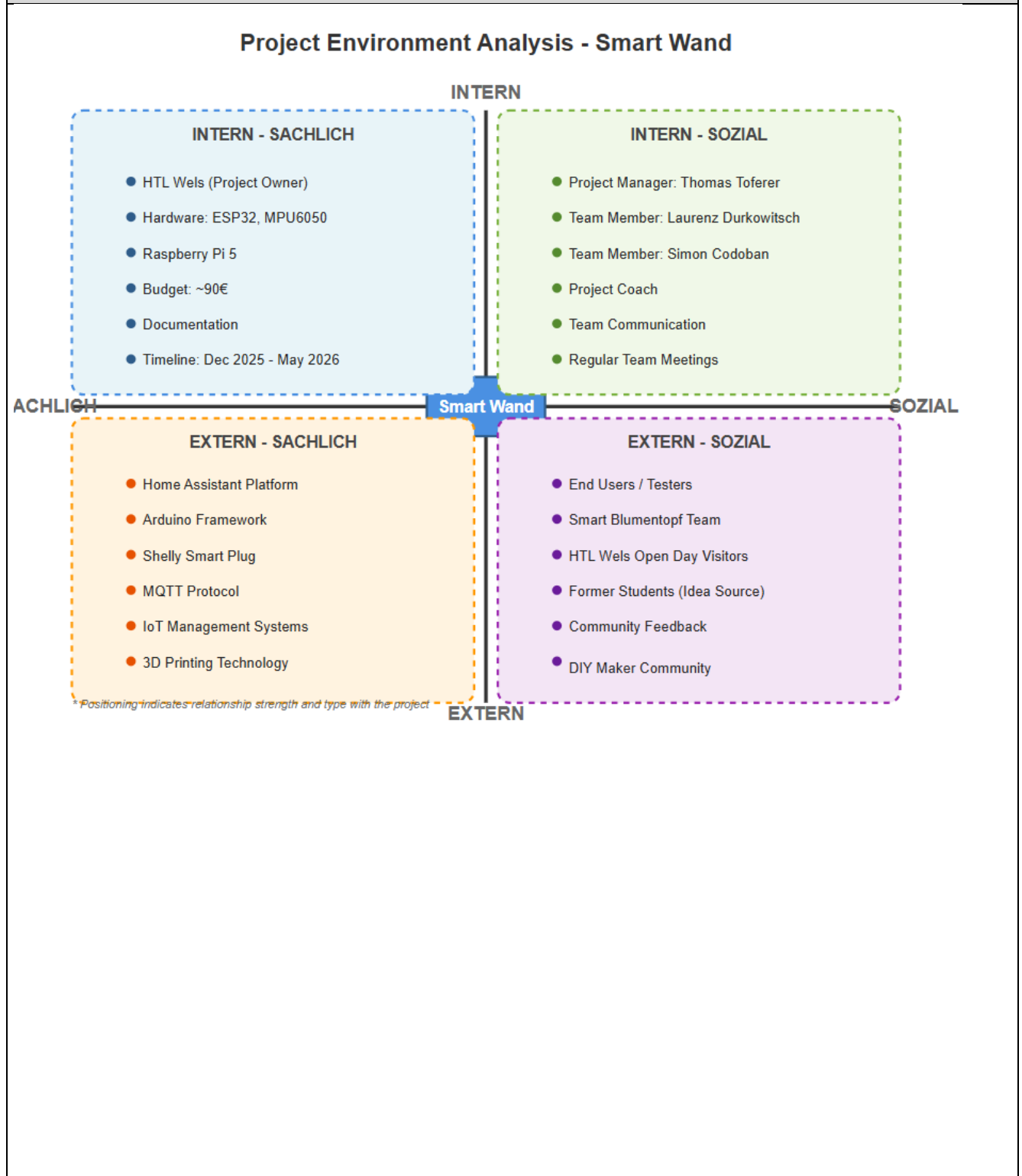
## 1.3 Description of Pre- and Post Project Phase

Smart Wand 1	<b>DESCRIPTION OF PRE- AND POST- PROJECT PHASE</b>
<b>1) Pre-project phase</b>	
<i>What triggered the project?</i>	
<ul style="list-style-type: none"> <li>• The project was proposed by a school assignment in ITP.</li> <li>• The idea of the project was given to us by a former student of HTL Wels.</li> <li>• The project idea was exactly what we wanted for an educational project. To develop this accessory, we need to build skills in various fields of computer science, offering a good overview of choosing the right career path in the future.</li> </ul>	
<i>Relevant documents for the project („Minutes“, ... ONLY documents and no content necessary)</i>	
<ul style="list-style-type: none"> <li>• SmartWand_PSP</li> <li>• SmartWand_Goals</li> </ul>	
<i>Experience from similar projects</i>	
<ul style="list-style-type: none"> <li>• Xdj100s build (Toferer)</li> <li>• FPV Drones (Durkowitsch)</li> </ul>	
<b>2) Post-project phase</b>	
<i>What will happen after the project has ended?</i>	
<ul style="list-style-type: none"> <li>• Demonstration of the project on "open day" of HTL Wels 2026</li> </ul>	

## 1.4 Project Environment Analysis

Smart Wand  
1

### PROJECT ENVIRONMENT GRAPHIC





Smart Wand  
1

## PROJECT ENVIRONMENT TABLE

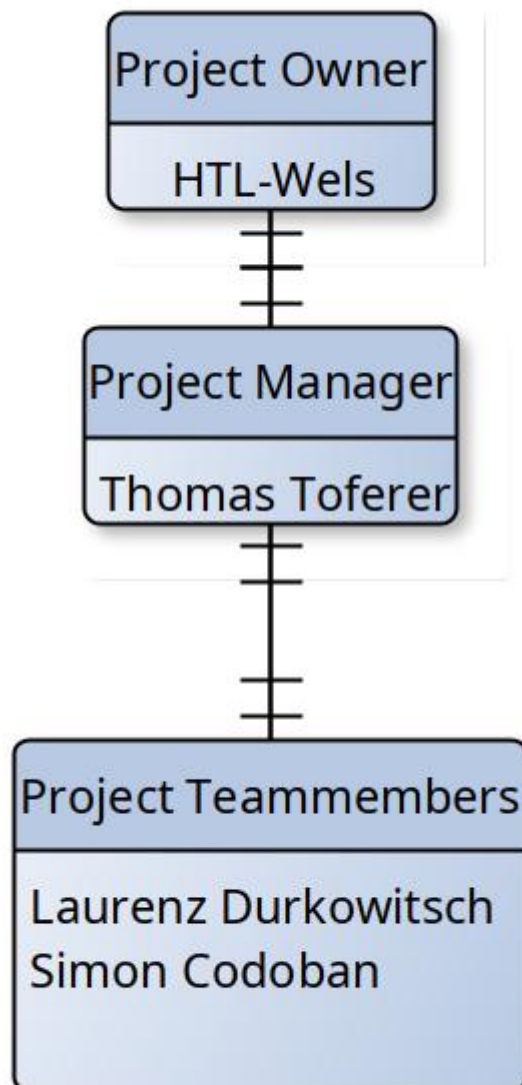
Environment	Relationship (potential/conflict)	Measures	Who / when  PSP Code
Internal	Investor	<b>Regular updates on project progress</b>	<b>HTL Wels alltime</b>
Tester/User	Feedback, Finding Bugs	Requirements gathering, early feedback	Everybody, Demo 1.1.1.4

## 1.5 Relationship to Other Projects and the Organisations' Strategy

Smart Wand 1 <div>RELATIONSHIP TO OTHER PROJECTS</div>			
Programs/ Projects/	Relationship (potential/conflict)	Sanctions	Who / when  WBS Code
Arduino Framework	We need those Open-Source Libraries to get sensor data. (get prohibited)	Development will be more difficult	1.1
Home Assistant	Managing IOT Devices and REST API calls. (get prohibited)	The project will have to use another IOT Management-Software	
Smart Blumentopf	Management Cooperation. Argument between PMs	Similar problems both projects could have, can't be solved with their knowledge.	

Smart Wand 1 <div>CONNECTION TO THE ORGANISATION'S STRATEGY</div>	
Strategy	Description of connection/relationship
-	-

## 1.6 Project Organisation Chart



Smart Wand  
1

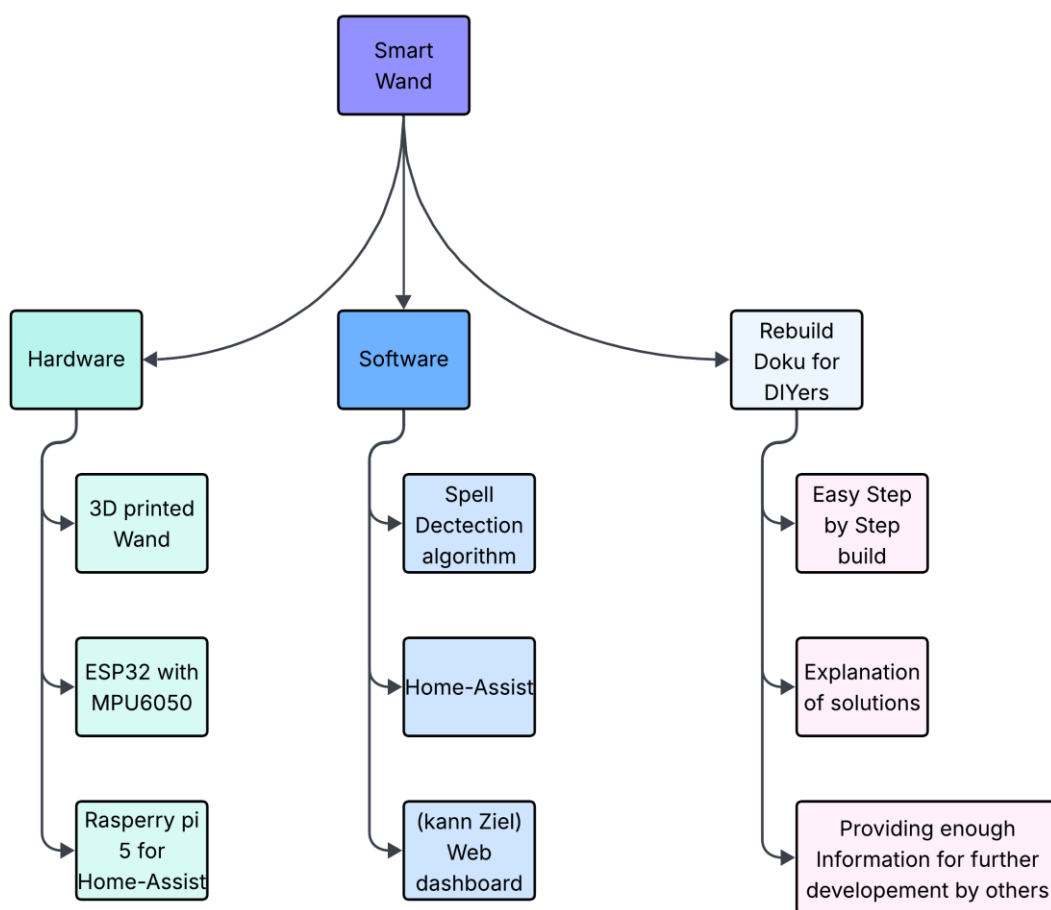
## PROJECT- ORGANISATION

Role in Project	Field of duties/Skills	Name
Project owner	Advisor for technical problems. Investor	HTL Wels
Project manager	Coordination, Development of Spell Detection	Toferer Thomas
Project team members	<ol style="list-style-type: none"> <li>1. Development of Rest API</li> <li>2. Helping with smaller tasks</li> </ol>	<ol style="list-style-type: none"> <li>1. Laurenz Durkowitsch</li> <li>2. Simon Codoban</li> </ol>
Project members		

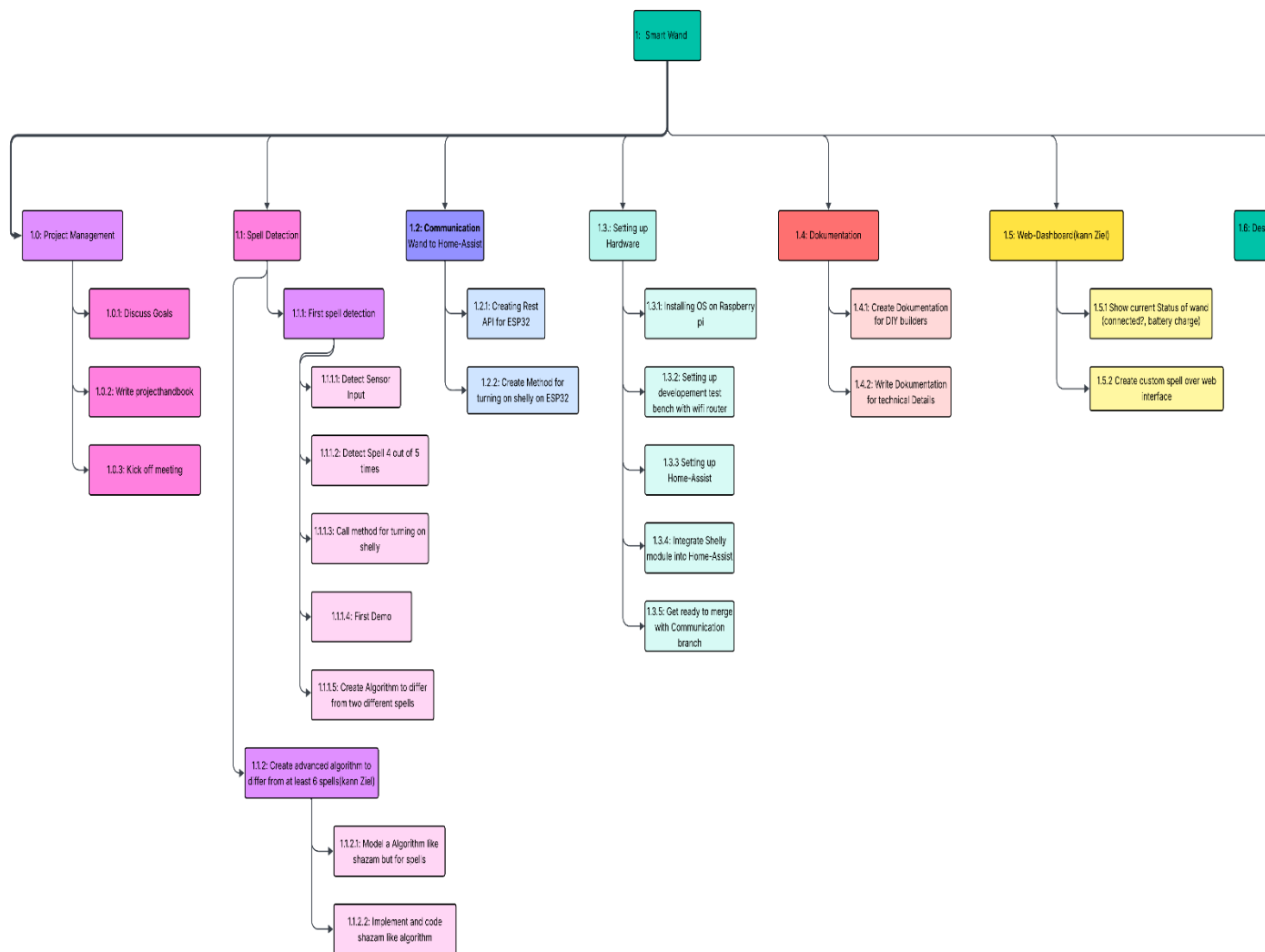
## 1.7 Plan of Objects of Consideration of the Project

Smart Wand  
1

### PLAN OF OBJECTS OF CONSIDERATION



## 1.8 Work Breakdown Structure (WBS)



PSP\_Smart-Wand.pdf

## 1.9 Project Work-Package Specification

Smart Wand 1	PROJECT WORK-PACKAGE SPECIFICATION
<b>1.1 Spell detection</b>	<b>WP Content</b> ( <i>What shall be done?</i> ) <ul style="list-style-type: none"> <li>Detect two Spells from wand movement</li> </ul>
	<b>Non-WP Content</b> ( <i>What shall not be done? optional</i> ) <ul style="list-style-type: none"> <li>Add acoustical Input to spell detection</li> </ul>
	<b>WP Result</b> ( <i>What is achieved after WP was finished?</i> ) <ul style="list-style-type: none"> <li>Reliable Spell detection</li> </ul>
	<b>Progress Measurement</b> ( <i>How is progress measured?</i> ) <ul style="list-style-type: none"> <li>Detection of spell 4 out of 5 times performing the m</li> </ul>
<b>1.2 Communication</b>	<b>WP Content</b> ( <i>What shall be done?</i> ) <ul style="list-style-type: none"> <li>Creating Rest API for ESP32 to MQTT Broker</li> </ul>
	<b>Non-WP Content</b> ( <i>What shall not be done? optional</i> ) <ul style="list-style-type: none"> <li>Rest API for other than MQTT</li> </ul>
	<b>WP Result</b> ( <i>What is achieved after WP was finished?</i> ) <ul style="list-style-type: none"> <li>Connection between ESP32 and Home-Assitant</li> </ul>
	<b>Progress Measurement</b> ( <i>How is progress measured?</i> ) <ul style="list-style-type: none"> <li>Connection yes or no</li> </ul>
<b>1.3 Setting up Hardware</b>	<b>WP Content</b> ( <i>What shall be done?</i> ) <ul style="list-style-type: none"> <li>Getting software installed and setting it up to boot also integrate the Shelly system to Home-Assistant</li> </ul>
	<b>Non-WP Content</b> ( <i>What shall not be done? optional</i> ) <ul style="list-style-type: none"> <li>Installing different software then planned</li> </ul>
	<b>WP Result</b> ( <i>What is achieved after WP was finished?</i> ) <ul style="list-style-type: none"> <li>Working system that works as the base layer vor 1.2</li> </ul>
	<b>Progress Measurement</b> ( <i>How is progress measured?</i> ) <ul style="list-style-type: none"> <li>1. Software is installed</li> <li>2. Software is set up</li> <li>3. It works</li> </ul>
<b>1.4 Documentation</b>	<b>WP Content</b> ( <i>What shall be done?</i> ) <ul style="list-style-type: none"> <li>Documenting every step for DY Builders</li> </ul>
	<b>Non-WP Content</b> ( <i>What shall not be done? optional</i> ) <ul style="list-style-type: none"> <li>Installing different software then planned</li> </ul>
	<b>WP Result</b> ( <i>What is achieved after WP was finished?</i> ) <ul style="list-style-type: none"> <li>Working system that works as the base layer vor 1.2</li> </ul>
	<b>Progress Measurement</b> ( <i>How is progress measured?</i> ) <ul style="list-style-type: none"> <li>1. Software is installed</li> <li>2. Software is set up</li> <li>3. Working or not</li> </ul>
	<b>WP Content</b> ( <i>What shall be done?</i> )

<b>1.6 Design of the Wand (3D Model)</b>	<ul style="list-style-type: none"> <li>Making the design for the wand, enough space for the components but still slim and good looking</li> </ul>
	<b>Non-WP Content</b> ( <i>What shall not be done? optional</i> ) <ul style="list-style-type: none"> <li>Thick wand, ugly wand, easy to break wand</li> </ul>
	<b>WP Result</b> ( <i>What is achieved after WP was finished?</i> ) <ul style="list-style-type: none"> <li>A wand where the esp + gyro and batterie can be installed in the inside</li> </ul>
	<b>Progress Measurement</b> ( <i>How is progress measured?</i> ) <ul style="list-style-type: none"> <li>1. Final wand design</li> <li>2. Components fit</li> <li>3. Looking good</li> <li>4. Good feeling while holding and using it</li> </ul>



## 1.10 Project Responsibility Matrix

SmartWand 1														
PROJECT-RESPONSIBILITY-MATRIX														
WBS-Code	WP-Title	Roles & Environment												
		External project owner	Project owner	Project manager	Project assistant	Project team member 1	Project team member 2	Project team member 3	Project team member 4	Project team member 5	Project member 1	Project member 2	Project member 3	Project coach
<b>1.0</b>	<b>Project Management</b>		<b>I</b>	<b>R</b>		<b>C</b>	<b>C</b>							
<b>1.0.1</b>	<b>Set goals for project</b>		<b>I</b>	<b>R</b>		<b>C</b>	<b>C</b>							
<b>1.0.2</b>	<b>Write Project-Handbook</b>		<b>I</b>	<b>R</b>		<b>C</b>	<b>C</b>							
<b>1.0.3</b>	<b>Kick-off meeting</b>		<b>I</b>	<b>R</b>		<b>C</b>	<b>C</b>							
<b>1.1</b>	<b>Spell Detection</b>		<b>I</b>	<b>R</b>		<b>C</b>	<b>I</b>							
1.1.1	First spell detection		I	R		C	I							
1.1.1.1	Detect Sensor Input		I	R		I	I							
1.1.1.2	Detect spell 4 out of 5 time		I	R		I	I							
1.1.1.3	Call method for turning on shelly		I	R		C	I							
1.1.1.4	First Demo		I	R		C	C							
1.1.1.5	Create Algorithm for 2 spells		I	R		I	I							
1.1.2	Advanced Algorithm		I	R		I	C							
1.1.2.1	Model a Algorithm like shazam but for spells		I	R		I	I							
1.1.2.2	Implement and code shazam like Algorithm		I	R		I	I							
<b>1.2</b>	<b>Communication</b>		<b>I</b>	<b>I</b>		<b>R</b>	<b>I</b>							
1.2.1	Creating Rest API for ESP32		I	I		R	I							
1.2.2	Create Method for turning shelly on ESP32		I	I		R	I							
<b>1.3</b>	<b>Setting up Hardware</b>		<b>I</b>	<b>I</b>		<b>R</b>	<b>C</b>							
1.3.1	Installing OS on Raspberry pi		I	I		R	C							
1.3.2	Setteing up developement-bench		I	I		I	R							
1.3.3	Setting up Home-Assist		I	I		R	C							
1.3.4	Integrate Shelly module into Home-Assist		I	R		C	R							
1.3.5	Get ready to accept calls from ESP		I	I		R	C							
<b>1.4</b>	<b>Dokumentation</b>		<b>I</b>	<b>C</b>		<b>I</b>	<b>R</b>							
1.4.1	Create Docu for rebuilders		I	I		C	R							
1.4.2	Write technical documentation		I	C		C	R							
<b>1.5</b>	<b>Webdashboard</b>		<b>I</b>	<b>I</b>		<b>R</b>	<b>C</b>							
1.5.1	Show current status of wand		I	I		R	C							

1.5.2	Create custom spells over webdashboard		I	C		R	C							
<b>1.6</b>	<b>Design wand</b>		<b>I</b>	<b>C</b>		<b>R</b>	<b>I</b>							
1.6.1	Design first prototype		I	C		R	I							
1.6.2	Redesign first design		I	C		R	I							

Functions

R .....Responsible

C .....Contribution

I .....has to be informed

## 1.11 Milestoneplan

<div> <div> <div>&lt;Project name&gt;</div> <div>&lt;Project no.&gt;</div> </div> <div>MILESTONEPLAN</div> </div>				
WBS-Code	Milestone	Plan date	Revised date	Actual date
	Setup of HomeAssist and addinional Hardware	15 January		
	<b>Spell Detection</b>	<b>1 Feburary</b>		
	Communication from wand to HomeAssist	20 Feburary		
	Preperation for first Demo	1 March		

\*In order of plan dates.

## 1.12 Project Bar Chart

## 1.13 Resource Plan

<div> <div>&lt;Project name&gt;</div> <div>&lt;Project no.&gt;</div> <div>Resource Plan</div> </div>						
WBS-Code	Phase/Work-package	Type of resource	Planned quantity (days)	Revised quantity (days)	Actual quantity (days)	Deviation (days)
	Detecting spells	Time, ESP32, MPU6050	30			
	Developing Rest API	Time	30			
	Configure Hardware with Home-Assist	Time, Raspberry pi,	15			
	Writing Dokumentation	Time	30			

## 1.14 Project Cost Plan

<div>Smart Wand</div> <div>1</div> <div>PROJECT COST PLAN</div>					
WBS-Code, WP-Title	Type of Cost	Planned cost	Revised cost	Actual cost	Deviation
	• Personnel	0	0	0	
	• Material	< 90€			
	• External services	0	0	0	
	• Other	0	0	0	
	Total	< 90€			
	• Personnel				
	• Material				
	• External services				
	• Other				
	Total				
	• Personnel				
	• Material				
	• External services				
	• Other				
	Total				
Project cost					

## 1.15 Project Communication

<div> <div> <div>&lt;Project name&gt;</div> <div>&lt;Project no.&gt;</div> </div> <div>PROJECT-COMMUNICATION</div> </div>				
Title	Objectives, Content	Participants	Schedule	Location
Project owner meeting	<ul style="list-style-type: none"> <li>project status</li> <li>decisions</li> <li>acceptance of progress report</li> </ul>	Project owner, Project manager		
Project controlling meeting	<ul style="list-style-type: none"> <li>project status</li> <li>controlling of tasks, schedule, resources, costs</li> <li>controlling of project environments</li> <li>social controlling</li> <li>prepare proposal for decision</li> </ul>	Project manager, Project team, Project coach		
Subteam meeting	<ul style="list-style-type: none"> <li>Coordination of subteams</li> <li>Discussion of problems</li> </ul>	Subteam		
	<ul style="list-style-type: none"> <li></li> </ul>			

## 1.16 Project „Rules“





## 1.18 Project Documentation

Area	Description
File	
Access Authorisation	
Naming convention	
Rules	

## 2 Project Start

### **2.1 Minutes– Project Start**

#### **2.1.1 Project Start Workshop**

#### **2.1.2 Follow-up Workshop**

#### **2.1.3 Project Owner Meeting**

## 3 Project Co-ordination

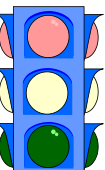
### 3.1 Approval of Work-packages

<div style="display: flex; justify-content: space-between; align-items: center;"> <div style="color: blue;">           &lt;Project name&gt;            &lt;Project no.&gt; </div> <div style="text-align: center;"> <h3>APPROVAL OF WORK-PACKAGES</h3> </div> </div>					
WBS-Code	Work-package	WP-Owner	Date	Approval by	Signature

### 3.2 Minutes – Project Co-ordination

## 4 Project Controlling

### 4.1 Project Status Report

<div style="display: flex; justify-content: space-between;"> <div>           &lt;Project name&gt;            &lt;Project no.&gt; </div> <div> <b>PROJECT STATUS REPORT</b>            as of ..... </div> </div>	
<div style="display: flex; align-items: center;">  <div style="margin-left: 10px;"> <p>Project crisis</p> <p>Project in difficulties</p> <p>Project according to plan ✓</p> </div> </div>	<b>Overall Status:</b> <ul style="list-style-type: none"> <li></li> </ul>
<b>2) Status Project objectives</b> <ul style="list-style-type: none"> <li></li> <li></li> </ul>	<b>Activities:</b> <ul style="list-style-type: none"> <li></li> <li></li> </ul>
<b>3) Status Project progress</b> <ul style="list-style-type: none"> <li></li> <li></li> </ul>	<b>Activities:</b> <ul style="list-style-type: none"> <li></li> <li></li> </ul>
<b>4) Status Schedule</b> <ul style="list-style-type: none"> <li></li> <li></li> </ul>	<b>Activities:</b> <ul style="list-style-type: none"> <li></li> <li></li> </ul>
<b>5) Status Resources/ costs</b> <ul style="list-style-type: none"> <li></li> <li></li> </ul>	<b>Activities:</b> <ul style="list-style-type: none"> <li></li> <li></li> </ul>
<b>6) Status Context</b> <ul style="list-style-type: none"> <li></li> <li></li> </ul>	<b>Activities:</b> <ul style="list-style-type: none"> <li></li> <li></li> </ul>
<b>7) Status Organisation/ culture</b> <ul style="list-style-type: none"> <li></li> <li></li> </ul>	<b>Activities:</b> <ul style="list-style-type: none"> <li></li> <li></li> </ul>

## **4.2 Additional Project Status Reports**

## **4.3 Minutes – Project controlling**

### **4.3.1 Project Controlling Meetings**

### **4.3.2 Project Owner Meetings**

# 5 Project Close Down

## 5.1 Project Close Down Report

<div style="display: flex; justify-content: space-between;"> <div>           &lt;Project name&gt;            &lt;Project no.&gt; </div> <div> <b>PROJECT CLOSE DOWN REPORT</b> </div> </div>																	
1) Overall impression		2) Reflection: Fulfilment of objectives															
3) Reflection: Deliverables / Schedule																	
4) Reflection: Resources / Costs																	
5) Reflection: Internal Organisation / Environmental Relationships																	
6) Performance appraisal (Project owner, Project manager, Project member)		7) Lessons learned (Summary of Experiences and suggestions for improvement)															
8) Post-Project Phase Planning, Additional Tasks <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">To-Do</th> <th style="width: 20%;">Owner</th> <th style="width: 20%;">Schedule</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td></tr> </tbody> </table>			To-Do	Owner	Schedule												
To-Do	Owner	Schedule															
9) Project Close Down <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div>             .....              &lt;Name&gt; (Project owner)           </div> <div>             .....              &lt;Name&gt; (Project manager)           </div> </div>																	

## **5.2 Minutes – Project Close Down**

### **5.2.1 Project Close Down Workshop**