Politecnico di Torino

Department of Management and Production Engineering

Master of Science in Engineering and Management

REVIEWING ORGANIZATIONAL PROGRAM MANAGEMENT MATURITY AND BEST PRACTICES IN A LARGE BUSINESS INFORMATION SYSTEM DEPLOYMENT

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It is my duty to dedicate this space of my work to the people who have contributed, with their tireless support, to its realization.

First of all, a special thanks to my supervisor Demagistris, for his immense patience, for his indispensable advice, for the knowledge transmitted throughout the drafting process.

Thanks also to my co-supervisor Ottaviani for his valuable advice and for promptly suggesting the right changes to make to my thesis.

I am infinitely grateful to my parents and my sister who have always supported me, supporting with my decisions.

I thank Silvia for having always been present during this last phase of my studies and for feeding me with pizza and pannacotta after entire days shifts.

Thanks to my friends for always being present during my studies. Thanks for all the carefree moments.

Finally, I dedicate this thesis to myself, to my sacrifices and my tenacity that have allowed me to get here.

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1. Introduction

1.1 Thesis Purpose

In this thesis has been carried out a review of organizational program management maturity and best practices in a large business information system deployment.

To perform this review, it has been firstly analysed the project background. All confidential information related to this IT Company has been removed to preserve its identity and the paper is developed in general terms, with products secreted and renamed “Fruits”, main company called “Company Alfa” and the subsidiary “Company Beta”. The project is structured on the implementation of an ERP system on an Agricultural Company, which deals with the end-to-end process of Fruit production and global distribution.

Methodology & Project Approach has been analysed to highlight the Key Success Factor that makes the project successful and being a driver factor for being chosen over competitors.

After having settled an analysis on Methodology & Project Approach applied on project by IT Company it has been developed a further analysis about OPM3 Best Practices’ Knowledge Foundation highlighting the gap between literature and real application. To assess the gap a self-assessment tool has been tailored for this case. A questionnaire has been developed and successively filled by consultants currently employed by IT Company’ project with Company Alfa.

Looking at the Methodology & Project Approach currently applied by the IT Company and the results recorded through self-assessment tool filled by consultants enrolled in projects of IT Company, it has been founded those standards contained within OPM3 Best Practices’ Knowledge Foundation cannot be applied as they are listed within Knowledge Foundation, but they should be tailored following industry characteristics and project type.

1.2 Project Background

Company Beta is a Division of Company Alfa created for managing Fruit business within the Group. Company Beta currently includes N companies dealing with Farm and Industrial Fruit processes.

The mission of Company Beta is to create and deliver value to Company Alfa Group by mastering the "**Fruit end-to end Value Chain"**. The 4 pillars of the E2E value chain are:

- "**Farm-Business Development**" with the objectives to increase worldwide Fruits availability;
- "**Strategic Sourcing**" by ensuring supply;
- "**Industrial Footprint**" with strong processing capacity;
- "**B2B**" by maximizing value for by-products.

Company Alfa wants to start the implementation of ERP of Company Beta Group with the **Company Beta & Farm template in FarmBrasil** and subsequent roll-out of the solution **in FarmSpain**.

Figure 1 - Company Location

FarmBrasil is representing within the E2E value chain of Alfa the most complex and complete company that includes inside it all the 4 pillars of the value chain. It is also representing the biggest one within the 6 Farm Locations of Alfa in terms of Owngrowing Business / Plantation.

FarmSpain is representing one of the key farm company in development for Alfa and its Agribusiness to keep increasing the global availability of fruits.

In line with the business strategy and Alfa IT Target Architecture, objective is to start the implementation of ERP Platform of **Alfa Group** with the Alfa & Farm Template in **FarmBrasil**.

Objective of this project aims to assist Alfa Company on implementing Alfa ERP model to FarmSpain company in alignment to Alfa Model and suitable with nature of Fruits and Farm business.

The main objectives of the project are:

- **Implement a roll-out part connected to ERP from Alfa subsidiaries' template** for the main part of ERP System modules involved in the current project;
- **Implementation of a new part for Farming flow** by following the model of Selection in Production ERP Module;
- **Implement a connection between ERP Farm Solution and the Cost Controlling model** and an integration with an external Cloud Solution (SaaS) to allow the retrieving of several activities, task order, consumptions in the field/farms managed by this solution already present.

This project will cover all industrial area within the company:

- Master Data Management
- Warehouse & Logistics
- Purchasing
- Sales & Intercompany
- Production & Quality Management
- Integrations with secondary databases

Project Plan

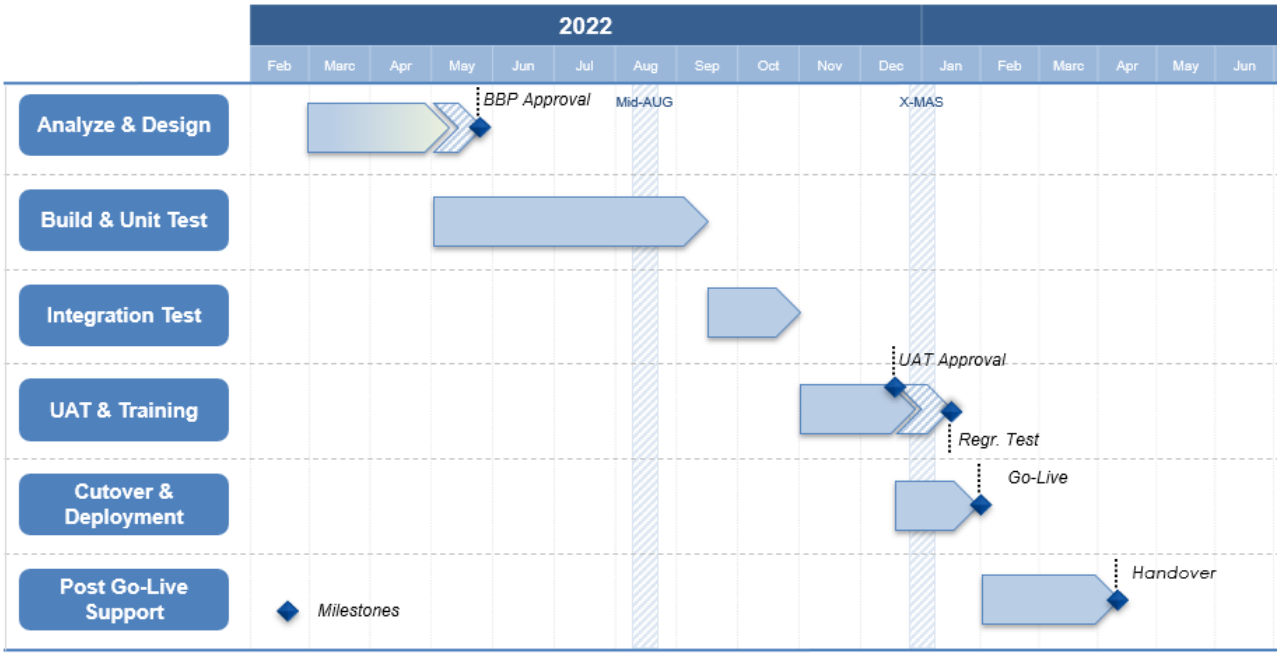


Figure 2 - Scheduling Gantt Chart

Project Approach

1. **Exploration**, gathering and analysis of business requirements through Business Blueprint [1],
2. **Realization**, perform activity necessary for implementing what has been designed and approved within BBP documentation;
3. WRICEF [2] development for program adjustments and new functionalities;
4. **Test & Training**, Coordination of overall test activities including planning, test system preparation, execution and monitoring;
5. Deploy & Run with the Technical Go-Live and subsequent Business Go-Live.

Business Organization Chart

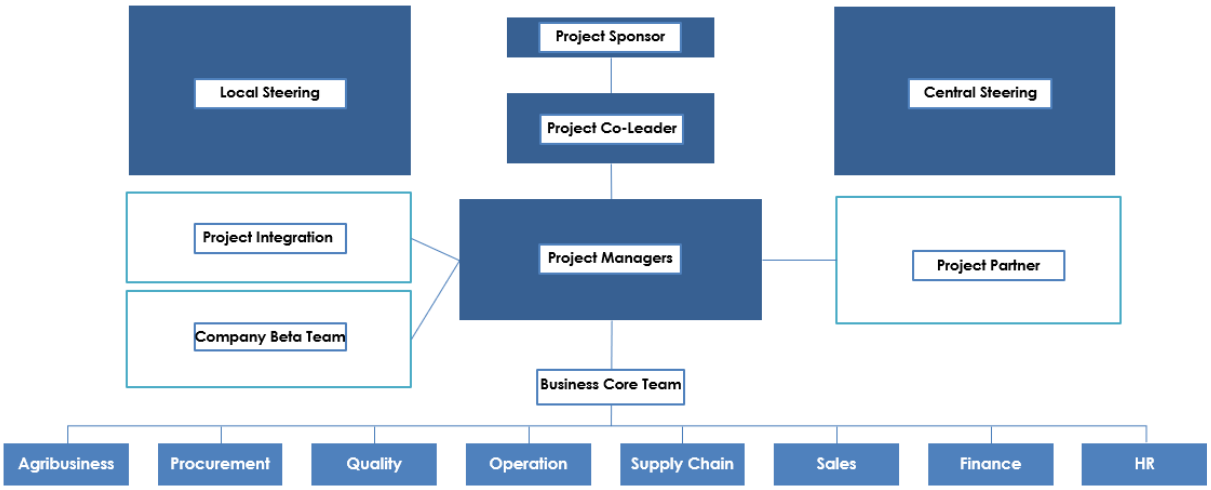


Figure 3 – Organizational Chart

An organizational chart is a diagram that visually conveys a company's internal structure by detailing the roles, responsibilities, and relationships between individuals within an entity.

As we can observe Project managers have a fundamental role in the project because links all the other area of the project. They are the channel between the Business Core Team that oversees development of the project and the stakeholders of Company Alfa.

Project Governance

Project Management refers to the overall Governance and control of the different Project Streams to track and properly address eventual issues, guarantee the cross-Stream alignment and collaboration and support the achievement of the desired outputs.

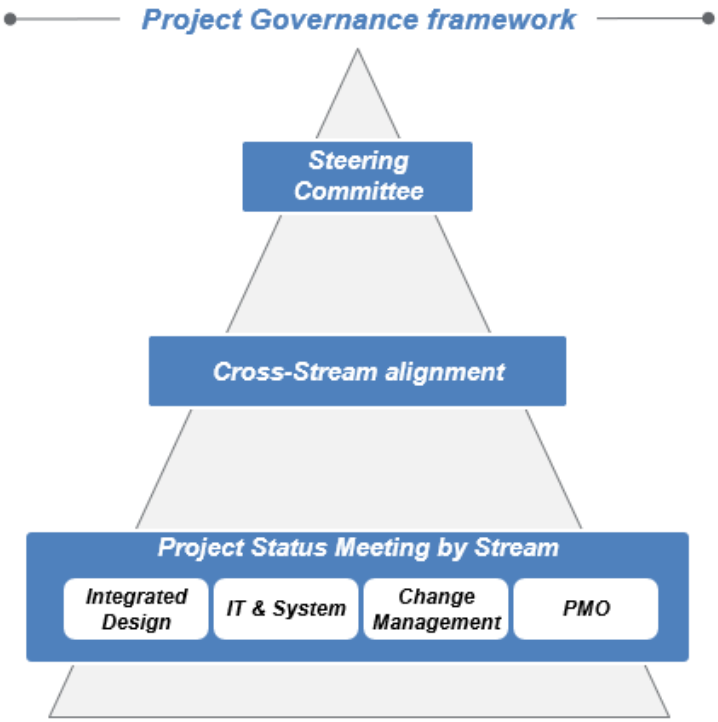


Figure 4 - Project Governance framework

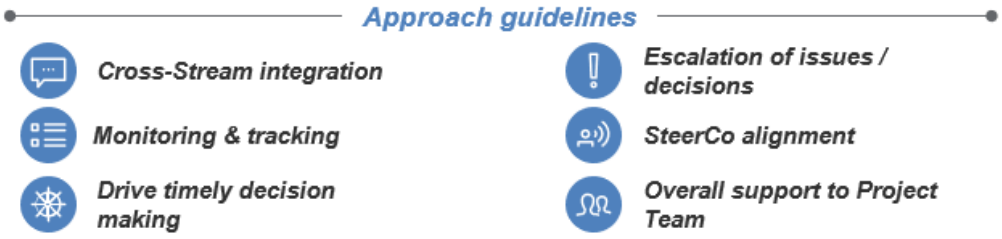


Figure 5 - Approach guideline

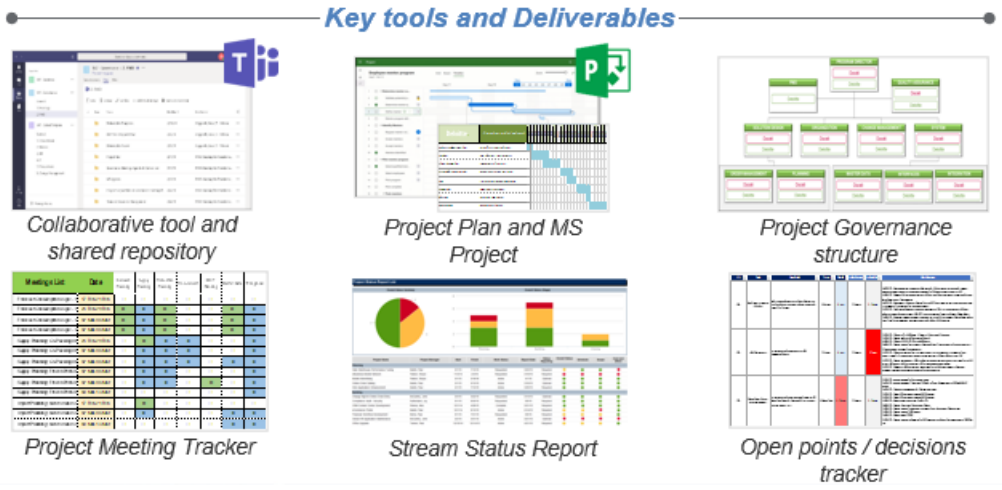


Figure 6 - Key Tools and Deliverables

Program Management Office

The **Program Management Office (PMO)** executes the program governance principles, model and processes, with a structured and standard communication cadence to align stakeholders, manage progress and escalate risks.

Governance Meetings

Meetings	Frequency	Purpose
PMO Status meeting	Weekly	• Cross-workstream review of project status • Discuss cross-project issues and priorities, project timeline
IT Status Update Meeting	Monthly (or if needed)	• Project Status • Technical issues & open points for each module
Local Steering Committee	Monthly	• Update on progress, performances, milestones achieved, risks and issues for escalation • Discuss change in project scope and timeline
Group Steering Committee	At Project Milestones (or if needed)	• Overall project review • Escalation of high impact issue • Go/No-Go decisions

Figure 7 - Governance Meetings

Change Management

Change Management represents one of the **key factors to enable the success of Alfa's FarmBrasil initiative**; focusing on **engagement** as a specific element to ensure transition and **people** as main drivers and active supporters of the transformation.

Company Alfa wants the partner to support the Company Beta Change Management Coordinator / Point of Reference in the project to structure and follow **a change management program that enables the FarmBrasil organization to proactively move from current state toward the desired state**. For this reason, a **Change Management integrated approach** has been recommended, focusing on:

- Internal Stakeholder Management
- Internal Stakeholder Communication
- Internal Stakeholder Engagement
- Internal Stakeholder Training Business Reinforcement

To ensure the success of this global initiative, it is necessary that the Organization and the People:

- Reinforce actions on the organization readiness
- **Easy user guidelines/training** (possible recorded / local language)
- **Feel engaged** and feel their **feedbacks are listened and understood** during the phases of analysis (As-Is) and new Model design
- **Communication Plan / Deck** (Newsletters etc.)

1.3 Stakeholders

Stakeholder of the thesis are:

- the **Candidate**, Tommaso Scarrone, that is in charge of the development of the thesis analyzing topics related to the thesis itself;
- the **Supervisor**, Professor Paolo Eugenio Demagistris, that is in charge to guide the student through the development of the thesis;
- the **Co-relator**, PhD Filippo Maria Ottaviani, that is in charge to advise in the development of the thesis;
- the **University**, Politecnico di Torino, that has interest in the development of analysis about topics inherent about the courses oh his students.

2. Methodology & Project Approach

2.1 IT Company Project Development Methodology

IT Company uses its global project development method, **Project Development Methodology** (PDM) [3] for ERP, as its guide to help project development on ERP enabled transformations and implementations, such as Alfa's FarmBrasil & FarmSpain Roll out project. The PDM for ERP method puts the IT Company in a **leading position for repeatable and effective project deliveries**. Its method incorporates the collective experience and industry-leading practices accumulated from effectively building and deploying hundreds of ERP solutions around the world. PDM supports all project life cycle activities and provides a complete set of activities, processes, templates, and accelerators throughout each phase of the project. This helps the teams reduce the amount of time spent on creating new templates and frameworks for each project and increase time spent on developing a high-quality ERP solution that meets Alfa's needs.

The method spans and integrates **multiple capabilities**, helping IT Company approach Alfa's implementation from multiple perspectives and use the full breadth of IT Company firm. PDM for ERP encompasses leading practices in project management, change management, requirements and design, configuration, build and deployment, testing, and support.

PDM for ERP is **aligned with Project Management Body of Knowledge** (PMBOK).

PDM is a **scalable** framework that can be tailored to specific organizations, projects, and delivery approaches, and it is continuously updated based on the implementation experiences and innovative developments in the marketplace.

PDM for ERP helps **accelerate IT Company's solution delivery and deployment** and helps the teams deliver with discipline and with a focus on quality, predictability, and value.

2.2 Key Features of Use

PDM for ERP is used to help consistently deliver high-quality solutions and value on business transformation and technology integration projects. PDM for ERP provides:

- A standard, scalable approach for technology implementations;
- A set of step-by-step, repeatable tasks with integrated supporting tools, templates, and samples;
- An integrated, multi-disciplinary approach that applies across industries and service areas;
- An easy-to-navigate repository for templates and deliverables;
- The ability to adapt to different system lifecycle delivery models, such as waterfall and Agile for ERP approaches.

The table below summarizes additional features of IT Company's PDM for ERP methodology:

Approach category	Value drivers
Optimize rework through rigorous requirements management	• Helps reduce rework and promotes effective scope management through a rigorous process to establish and manage requirements traceability • Supports stakeholder management and engagement as well as end-user adoption activities
Improve project quality with proactive defect management	• Improves transparency through processes, procedures, and tools for identification, analysis, resolution, and process improvement

Approach category	Value drivers
	• Reduces overall defects and improves software quality by proactive detection, prevention-based software development, rigorous test management, and quality assurance methods activities.
Focus on cost-effective integrated testing	• Supports cost-effective delivery and lower project risk with integrated testing processes, methods, tools, and reporting to cover functional and non-functional capabilities • Supports knowledge transfer and enhances end-user satisfaction and adoption by integrating Alfa resources in key testing processes, particularly User Acceptance Testing (UAT)
Facilitate knowledge transfer with support documentation	• Helps provide a strong foundation for ongoing service and support through appropriate documentation • Supports effective knowledge transfer, helping reduce the project life cycle and ongoing support costs by integrating appropriate Alfa resources into Software Development Life Cycle (SDLC) processes and development of technical documentation
Integrates security throughout the solution	• Integrates security throughout the SDLC to help identify security requirements, define architecture, and design necessary security controls to protect data in new solution
Uses ITSM framework to facilitate AMS (Architecture and Manager of the System) transition	• Helps achieve smooth transition and effective maintenance, upgrades, and enhancements through well-designed and effective service management processes and outcomes experienced by user community after solution deployment • Enables knowledge transfer through integration of client resources in key maintenance and operation processes

Table 1 - Approach and Value drivers

PDM Waterfall approach for ERP Projects:

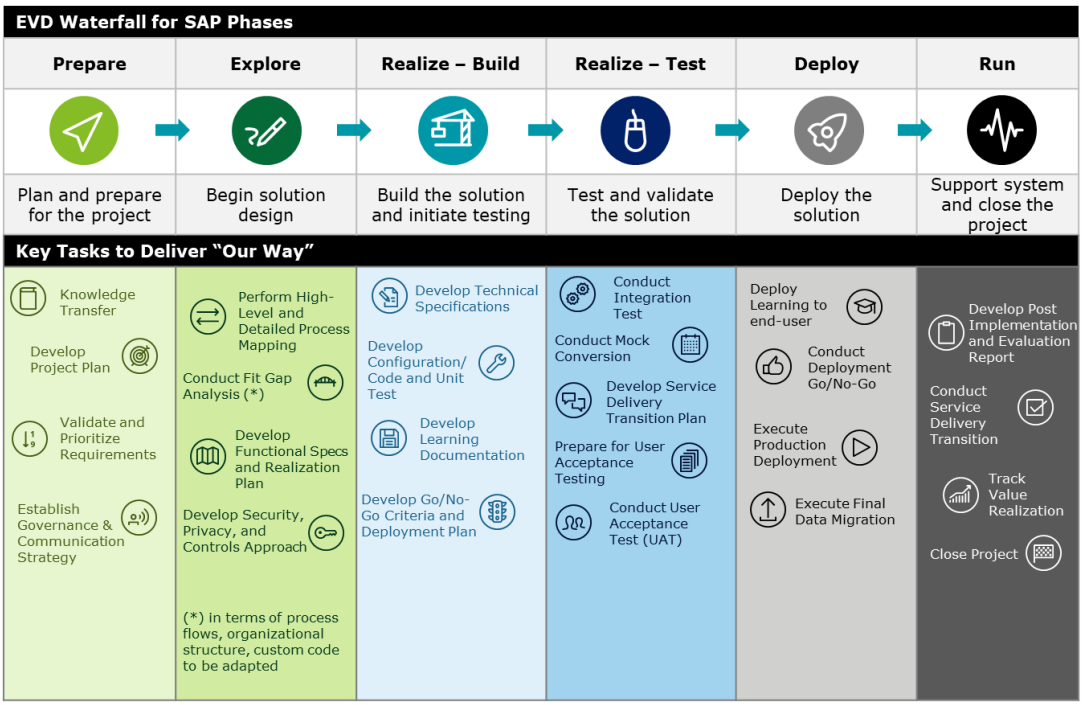


Table 2 - Waterfall approach for ERP Projects

2.3 Project Approach

Methodology proposed for FarmBrasil & Spain Roll out project, **is based on Company Alfa Standard Roll-out Methodology and Company IT PDM Method.**

This methodology has been applied by Project team in several previous roll out projects, in Alfa, both for Industrial and Commercial template. Approach applied during these projects, is in line with Global ERP System methodology, designed by the ERP System Owner in order to get the better benefit from roll out projects for company working in a global environment.

The specific phases of the approach used in the project, are described as below.

2.3.1 Prepare

The objectives of this phase are to plan and prepare for subsequent project phases. This includes developing a project charter, project and quality management processes, a master plan, a work plan, and a deliverables log. During this phase, the project's organization structure is established, the project tool strategy is developed, and resources are assigned.

Deliverable of this phase are:

- Definition and sharing of project documents that will be updated during each project phase for monitoring project status;
- Kick-off meeting presentation and execution.

2.3.2 Explore

The objective of this phase is for the parties to establish a common understanding of the existing pre-analysis realized by Company Alfa as reported in RFP.

The WRICEF list will be outlined and validated.

This includes conducting workshops to revise the content of each process requirements and template solutions to determine the best options for gap resolution, developing and initiating the technical analysis, documenting configuration design and functional specifications, identifying change impacts, and defining the user training approach.

IT Company has already the knowledge of Company Alfa Template, but it’s important that Company Alfa and MITG users (Manager IT Group) will provide sufficient resources in order to perform Knowledge Transfer about what has been already done on ERP System and any other systems, including:

- Template processes with technical solutions already developed (standard and custom);
- Functional and technical documentation.

The Knowledge transfer, for the needed topics, will be done by Company Alfa IT Central people (MITG) to IT Company team; they will be the responsible to maintain the Company Alfa Template and to do the activities of configuration in the system.

After ending the KT sessions, IT Company team will be able to:

- Conduct Workshops and Fit-Gap Analysis for defining Gap List, including all the requests that differs from Group Template

- Define TO-BE model (BBP), proposing technical solutions for covering Gaps (to be approved by responsible MITG)
- Prepare Functional and technical analysis documentation, showing the TO-BE solution in terms of processes affected and new developments

Objectives of this phase are:

- Analyze AS-IS procedure and system settings
- Collect all the requirements coming from the business needs
- Design and detail final solution to be implemented, including data migration strategy (listing master data to be migrated and related approach/tool)

Deliverable of this phase are:

- Business Blueprint (BBP) documentation, showing the to-be solution in terms of new organizational structures and processes impacted with identified gaps;
- Gap List and WRICEF, including all the requests that differs from Group Template clustered in:
    - Changes to existing template solution;
    - New processes to be added to Templates, because currently not covered;
    - Changes of standard ERP solution, required for fiscal/legal localization purpose;
    - Changes of existing custom programs, interface, printouts, …, already included in Company Alfa Templates.

All these requests, listed in Gap list, need to be analyzed and addressed together with Company Alfa Team in order to verify their coherence and feasibility within Industrial and Commercial Templates. Every changes to Group Template need to be preventively discussed with Company Alfa Project Manager and approved by Alfa IT Business Partner.

Approved gaps that requires system development, in terms of new or changes to programs, interfaces and/or printouts, will constitute the WRICEF list.

2.3.3 Realize – Build

System Configuration and Realization phase consist on all the technical activity necessary for implementing what has been designed and approved within the BBP documentation. It has the following objectives:

- Draw-up the relevant documentation (Configuration Script) in order to allow Company Alfa' MITG to verify and execute system configuration. The method of making documentation to be sent to the central MITG that carries out the system activities is not the practice, but the Company Alfa method to have a guarantee of the group model and to better manage the big amount of simultaneous projects they do (centralizing the modification of system settings);
- Perform all the approved development (WRICEF), as stated during BBP phase, in order to:
    - review of interfaces from/to external systems;
    - adjustment of existing custom programs and development of new ones, for covering global & local requirements;
    - review of printouts and reports as required;
    - built up the proper ERP workflows;
    - develop additional data migration tool, if required.
- Unit Test execution;

- Map of authorization and user role according to business needs and compliance rules (realization of ERP user profile).

Customizing

IT Company project team members and MITG referents, according to the usual standard Alfa's procedure, will perform customizing setting jointly:

- IT Company will create in File Directory Manager the dedicated requests to change basic database, attaching the proper documentation per each single system configuration setting
- MITG will perform system activity following IT Company project team indication
- Documentation will be provided both for Template solution and for new ad hoc solutions
- IT Company will verify the correct implementation of customizing required during unit test activity and MITG team will support bug fixing

System Enhancements

In order to grant high quality of the deliverables of this phase, IT Company foresees a Senior System Architect within the project team, which will have the responsibility of preserving the integrity of the system involved and manage the communication between functional team and programmer team.

For each custom solution to be developed Project Team will provides:

- Technical and functional analysis;
- Execution of ERP coding according to Alfa Company rules and methods;
- System and unit tests to verify their congruence with the analysis approved;
- A system that manages directory of uploaded files, needed for new custom program.

Data Migration

According to Data Migration strategy defined and included in BBP phase, IT Company Project team will conduct mock-up migration runs in test environment on a set of selected master data.

It will be done with the support of:

- Test Data migration tool and approach;
- Share data migration template file for upload and allow local IT to start data collection;
- Prepare test system for test cycles (unit, integration and UAT).

Unit Tests

Project Team will perform system and unit test in order to verify the correct configuration and System settings / developments.

Deliverable of this phase are:

- Unit Testing completion;
- Technical specification of customizing (COS) and custom developments;
- User roles mapping.

2.3.4 Realize - Test

The objective of this phase is to deliver product and/or solution training to the **KU** (Key Users population) (according to **train the trainer approach**) and to perform **integration tests and UAT** (User Acceptance Test)

with KU to confirm that the solution successfully meets the documented business and technical requirements and gain Key User and Process Owner validation.

Training

Training sessions will be performed with the approach of "train the trainer", preparing Key User for User Test phases and for end user training.

Project Team will provide proper materials (User manuals and test scenarios documentation) and support to enable them for the training execution.

Project Team will support Key User on end-user training planning and execution.

Training will be provided in official project language (English and Spanish where necessary), with Project Team onsite presence in Company Alfa. Training documentation will be prepared in English.

Test

Test scope will span:

- Processes and solution implemented, tested on specific business scenario shared and agreed with KU in order simulate real business case;
- Integration with other systems;
- User profile according to to-be business role authorization map;

Key Users will perform User Acceptance Test (UAT) and system validation with the strong support of IT Company Project Team, onsite presence in Alfa (according to Travel approach).

As below the list of main tests to be performed during this phase:

Tests on IT Company responsibility

- **Unit test**: Unit testing seeks to validate those individual functions are configured and/or developed to appropriately translate technical and functional requirements. Unit testing consists of configuration Unit Testing, Software Development Technical Unit Testing, Software Development Functional Unit Testing and Security Unit Testing.
  Unit tests are mainly performed during Realize-Build phase, or in User Test phase after the fixing of a defect raised during UAT.
- **Integration test**: integration testing seeks to validate a set of functions are properly set and/or developed to work together in the right way and fulfill the involved business process. It mainly refers to test the proper communication between ERP and external systems.

Tests on Company Alfa responsibility

- **User Acceptance Test (UAT)**: Selected key users conduct a set of selected test scenarios to confirm the implemented solution performs the intended functions and satisfies the business requirements. User Acceptance Testing seeks to test end-to-end business processes and attempts to simulate "real-life" business events.
  The UAT will be the responsibility of Company Alfa while IT Company will support. In accordance with this purpose, Project Team will provide specific test-script and will prepare the test system accordingly.
  The User acceptance test will be conducted onsite in Company Alfa, according to business users' availability.

Project Team also will provide proper material (User manuals and test scenarios documentation) and support to enable them for the documentation preparation.

- **No-Regression Test (NRT)**: No-Regression Test will be performed by MITG according to the standard procedure foreseen in Company Alfa.
  The aim of NRT is to verify that the changes performed by the project and approved during UAT, do not impact other existing process and procedure causing a regression of their functionalities.
  Defect found during NRT will be raised up by Local MITG and addressed to Project team for their fixing and resolution.

IT Company proposes 1 cycle of integration testing and 1 cycle of User Acceptance Testing (UAT). If a bug is identified during the test, Company Alfa will proceed with bug fixing activities and a second run of test will be performed directly by Key User with the support of Project team to verify the issue resolution.

Deliverable of this phase are:

- KU Training execution;
- Training documentation (User Manual, Training Scenario/Scripts, KU training calendars);
- UAT approval;
- UAT documentation (Test scenarios/scripts, issue log).

2.3.5 Deploy

The objective of this phase is for the project team to deliver the product or solution to the end users. This involves training of the end-user population and deploying the solution to the production environment as well.

Following the 'Train the trainer' approach, training to end-user will be conducted by Company Alfa Key User (previously trained by IT Company Project Team) and all the learning documentation will be shared with all the end-user population.

Deploying the solution in production system includes the following cutover activities:

- Maintenance of custom tables/sets in productions system
- Technical transport in production system of the new settings and developments
- Data migration of all the relevant master data
- Business activity preparatory to business go-live (in charge of Company Alfa with project team coordination)

Data Migration follows strategy and rules defined in BBP document. As by usual approach in Company Alfa Project:

- Historical data won't be migrated into the new solutions;
- Legacy data will be provided by Company Alfa Local MITG in the format and timing requested by Project team;
- Company Alfa will be responsible for all data cleaning, manual conversions, conversion rules, and post conversion validation of the data.

2.3.6 Run

The objective of this phase is the transition from the readiness activities of a preproduction environment to conducting business operations in the production system.

Support is provided, system transactions are monitored, support is transitioned until the handover to maintenance organization and then the project is closed.

Post Go-Live Support

IT Company will provide Post Go-live support according to specific project and business needs.

IT Company proposes a mix of onsite and back-office support, granting the onsite presence of the relevant project team resources for the most critical period of go-live and for the first user runs of the system.

The IT Company will provide support on a business hours weekly time basis for one single shift (5x8).

For FarmBrasil roll out it has been asked to have the flexibility to cover 7 days/week and 4 times/week also nightly shift. IT Company approach go-live approach foresees a scheduling of central and local resources in order to meet this requirement and to manage different scheduling coming from seasonality.

Handover

The handover to the MITG and AMS (Architecture and Manager of the System) team will be managed in accordance with the procedure developed by Alfa Company.

As below some relevant factors:

- Using a set of Key Performance Indicators designed to measure the stabilization of the system and the achievement of project objectives:
    - Effective availability and functioning of the main features of the system
    - Training activity with end users performed
    - Availability of project documentation
- Definition of critical moments in the handover process with involvement of the project team, MITG, AMS team business users.
    - Hand-over process KT (Knowledge Transfers) meeting to take place within two weeks from start to share the procedure
    - Periodical control of KPI`s (every two weeks)
    - Formal approval that move responsibility of support from IT Company to MITG and AMS

3. Process Analysis

In this chapter are analysed in detail the process that has been mapped during the first phase of the project "Analysis and Design". Recursive meetings with business have been performed in order to obtain a precise mapping of the requirements of the business. At these meetings participated all the personnel that were involved within the processes to be mapped.

3.1 Product Material Flows - Owngrowing

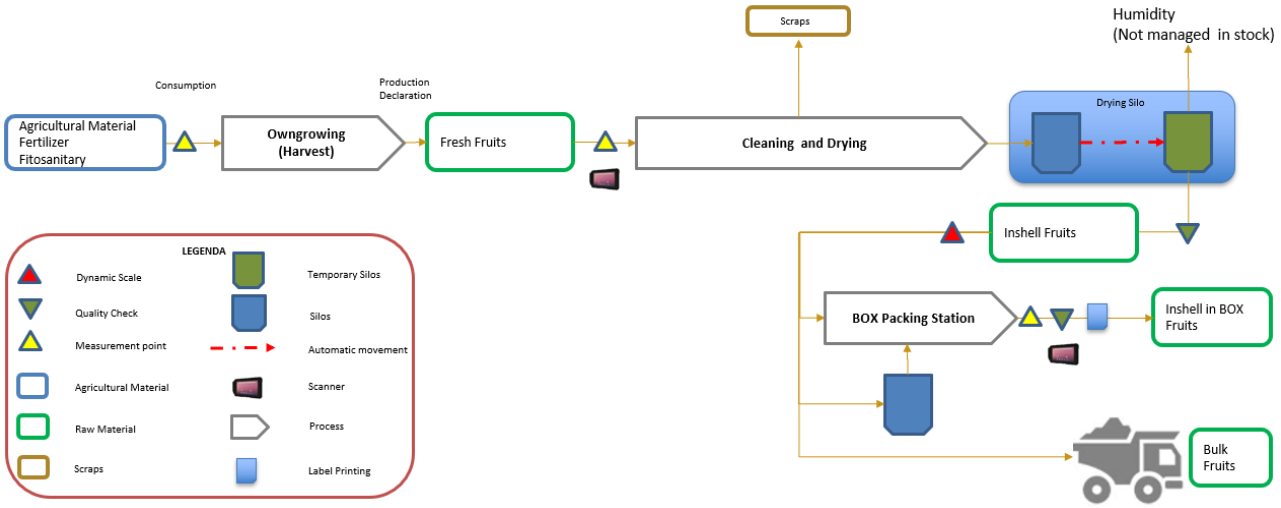


Figure 8 - Product Material Flow - Owngrowing

The process represented in figure 8 describes the steps that belong to the process of Fruits harvesting and the packaging into Boxes or transportation into bulks to other facilities.

For the cultivation it is required the consumption of materials like Agricultural Materials, Fertilizers and phytosanitary products. The consumption of these materials is tracked from the consumption of those materials into Owngrowing cost centers.
The first step of the process is the **"Harvest"** from the Owngrowing groves.

After harvesting, this kind of raw material are called **Fresh Fruits**, a product that requires to be cleaned and dried. From this process of **"Cleaning and Drying"**, the output are Fruits that need to be cracked and scraps that can be resold as by-products. The Drying process is performed through the usage of silos designed to dry uniformly the Fruits to achieve the desired level of humidity in the external part and into the kernel of the Fruit.

After the cleaning and drying process, a **quality check** is performed, to assess the quality level of the Fruits. From this process of quality assessment will be decided the final usage destination of the Fruit.

Dynamic scales are useful to weight the Cleaned Fruits.

The last step of the process is the **"BOX Packing Station"** that pack the fruits into boxes for the transportation to facilities for successive steps of the supply chain. Alternatively, if the amount of Fruits are too high then they will be transported to other facilities on trucks in bulk. At this point of the supply chain this product is still considered a raw material.

3.2 Product Material Flows – Cracking and Selection

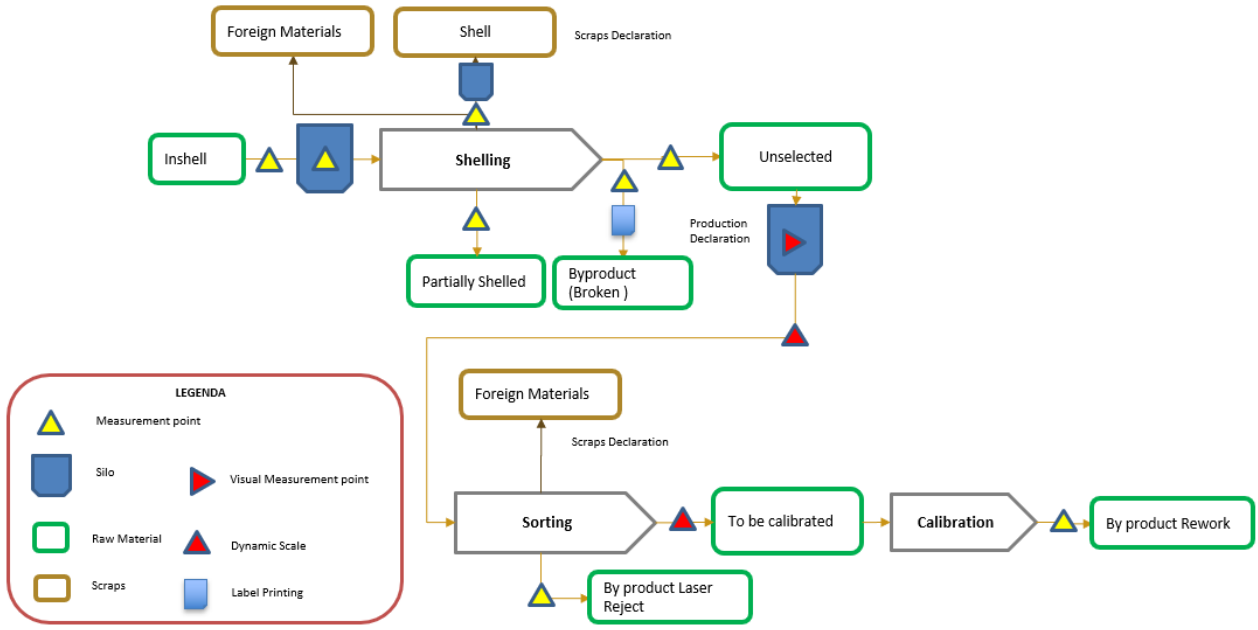


Figure 9 - Product Material Flow - Cracking and Selection

Before Cracking and Selection, the fruits are stocked within silos that are linked to the Cracking machinery.

First step of the process is the "**Shelling**" which consists in the separation of the external shell of the fruits from the kernel through cracking, to obtain only the kernel separated from the scraps. From this first step it is possible to obtain foreign materials such as stones or ground from the groves, shells from the fruits that can be used as by-product for feeding animals, fruits partially shelled to be reprocessed, fruits broken that can be sold as by-products.

The second step of the process is the **"Sorting"** of the Fruits through laser selection to separate from the fruits the remaining part of foreign materials to be discarded and products that does not match the quality requirements.

The last step of cracking and selection is the **"Calibration"** of the fruits to segregate them following size measurements and to direct the kernel to the different processes with respect to the quality requirements.

3.3 Product Material Flows – Sorting

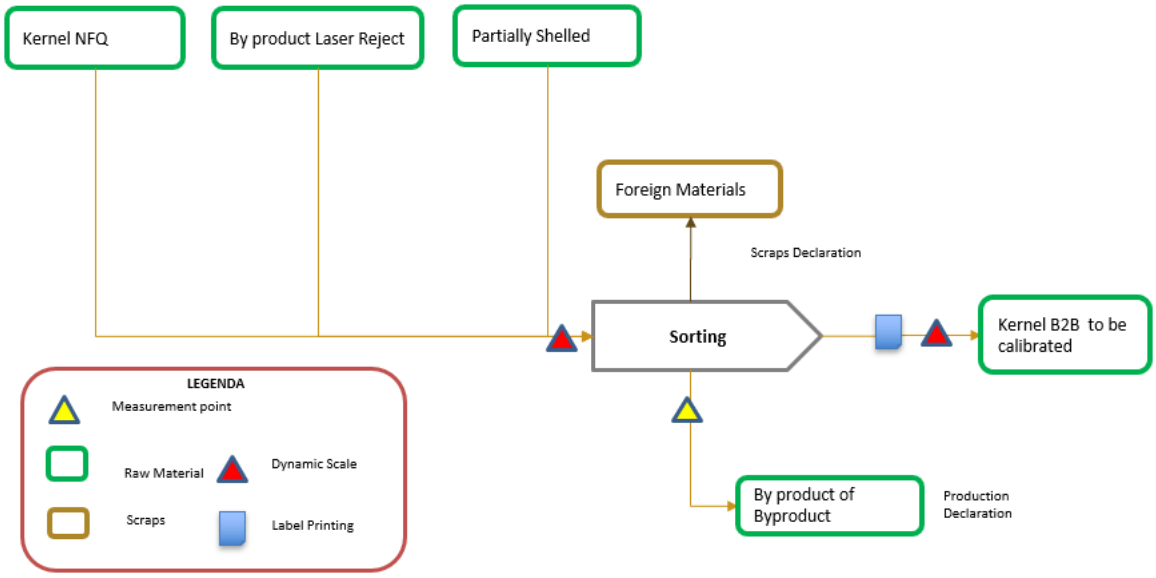


Figure 10 - Product Material Flow - Sorting

In figure above has been schematized **Sorting** process in detail, with input and outputs.

Inputs as Kernel, **By Product Laser Rejected** and **Partially Shelled** products are weighted on a dynamic scale to obtain the weight that enter the sorting process.

From Sorting are discarded foreign materials, not sellable as by products, with Scraps declaration. Then products that can be sold under the Company Alfa label are calibrated with laser selector and products that do not comply with quality standards of Company Alfa are sold as "**By product of By Products**".

3.4 Product Material Flows – Nursery

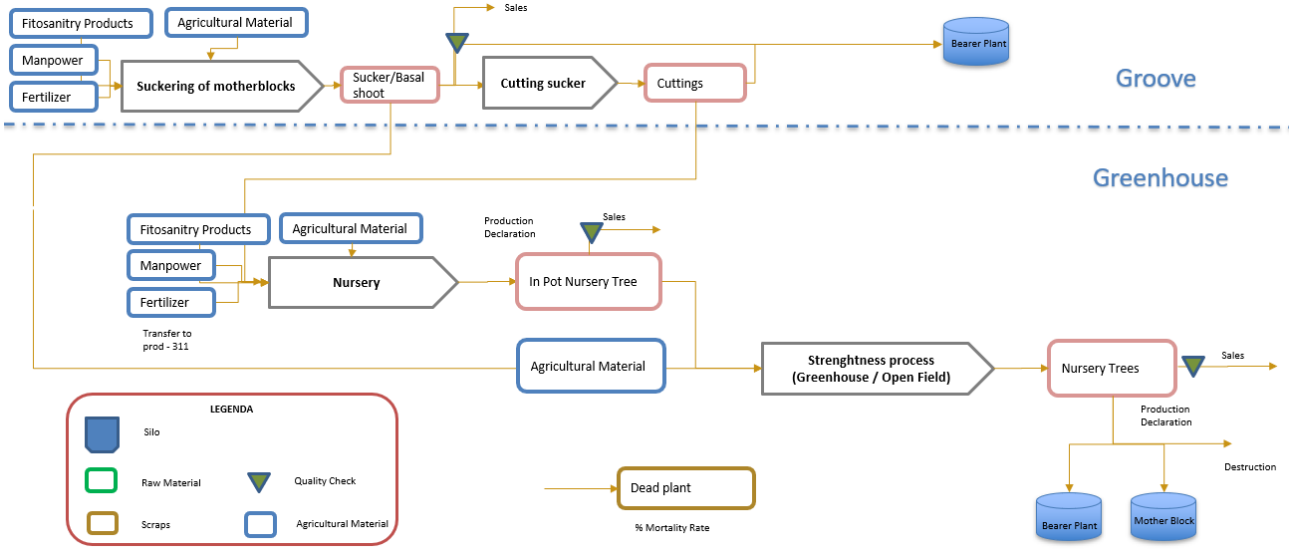


Figure 11 - Product Material Flow - Nursery

The process above shows all the steps that are required to obtain a **Nursery Tree**.

The Nursery Tree is a plant that after 7 years of growing can be considered as an adult and full productive plant.

The process starts with the "**Suckering of the Motherblock**". The motherblock are plants that are used to produce new **Basal Shoots**, and they can be used for years for the production with the only attention of do not cutting excessively the plant. Basal shoot can be directly sold or kept in the process of cultivation into Nursery Tree.

The **Basal Shoots are cut into more Cuttings** with the process of "**Cutting Sucker**". This first part of the process is realized in the Groove of Company Alfa. The second part of the process, the transformation of cuttings into Nursery Trees, is done within the Nursery or Greenhouse.

With the consumption of agricultural materials, phytosanitary products, fertilizers and manpower, the **cuttings are processed** and are classified with a new material code "**In Pot Nursery Tree**".

The last step "**Strengthens Process**" is kept in the open field or within greenhouses, and with the consumption of agricultural materials, the "In Pot Nursery Tree" becomes a **Nursery Tress of 1 year** and with the passing of the time nursery trees of 2 years and 3 years. After the third year the Nursery Tree can be sold or used to create a new productive plant (motherblock or productive plant of fruits).

A **contingency of 5% of mortality** of the plants have been considered as natural loss of Nursery Trees on this process. If higher mortality is registered, then the final quantity will be adjusted with a consumption adjustment of the stock.

Naming convention - Plant

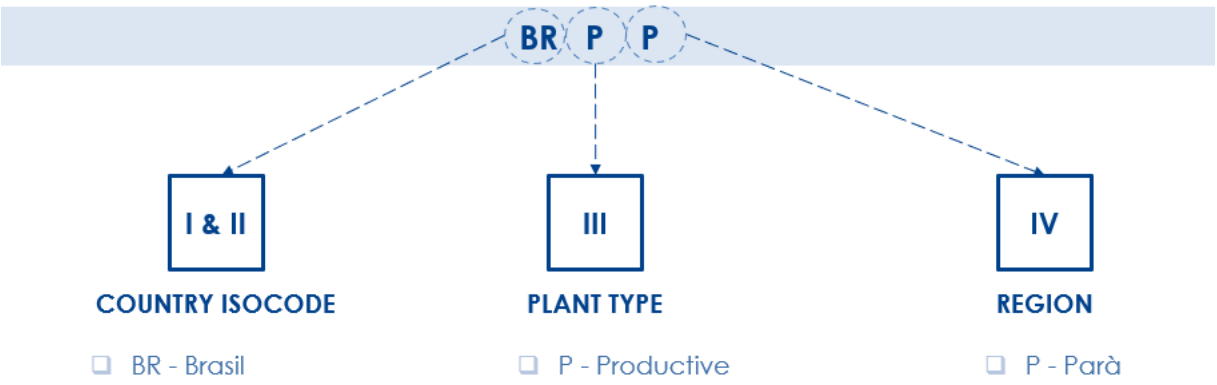


Figure 12 - Naming convention - Plant

To achieve uniformity among plants of Company Alfa has been structured a common naming convention among all the plants of the company.

- First and second digit: **Country ISO code**
- Third digit: **Plant Type** that can vary between Productive, Distributive and Service
- Fourth digit: **Region**

Naming convention – Storage Location

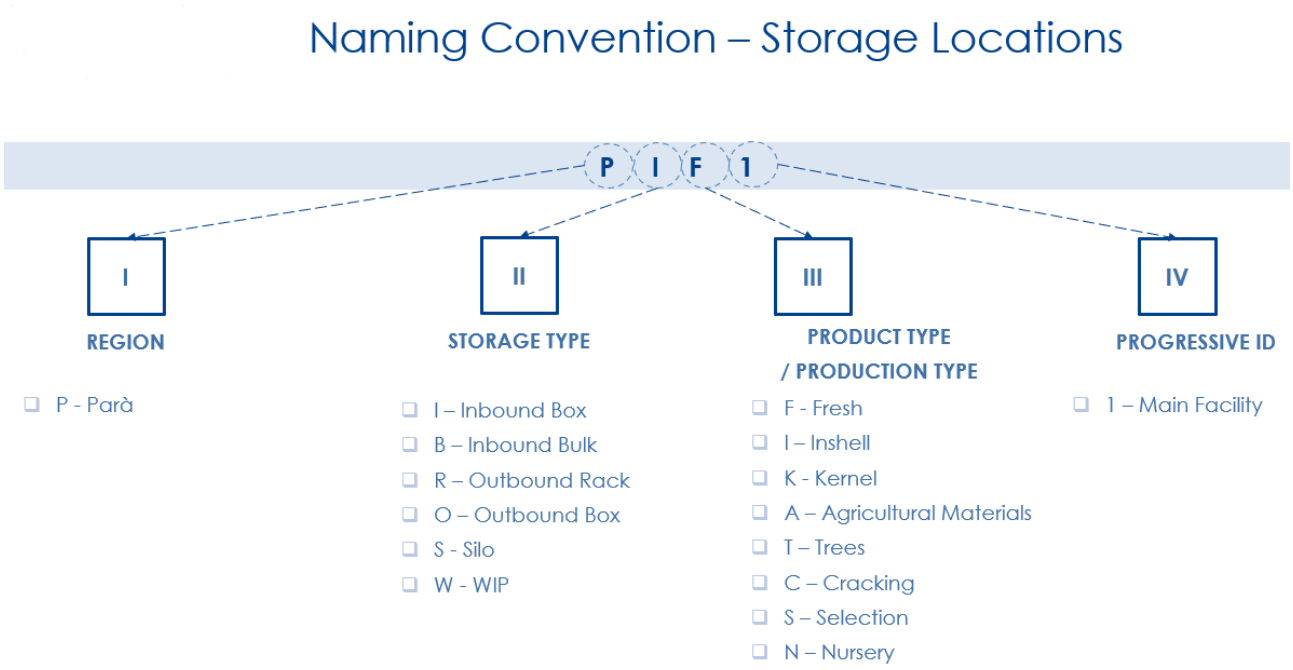


Figure 13 - Naming convention - Storage Locations

As per Plants naming convention also the storage locations have been structured a common naming convention to maintain standards between the subdivision of the sections of the plants.

- **Region**: in this case there is only the region of Pará
- **Storage Type**:
  - I – **Inbound Box** for the inbound of fresh fruits in box
  - B – **Inbound Bulk** for the inbound of fresh fruits stored in bulk
  - R – **Outbound Rack** for the storage of fresh fruits plant in rack
  - O – **Outbound Box** for the storage of fresh fruits in outbound storage location ready for departure
  - S – **Silo** useful for the stock of Fruits in warehouse and production department
  - W – **WIP** Work In Progress storage location, useful for production department
- **Product Type / Production Type**:
  - F – **Fresh** for that material that comes from farm
  - I – **Inshell** are the Fresh Fruits cleaned and dryed
  - K – **Kernel** are the Inshell Fruits cracked
  - A – **Agricultural Materials** for the growth of Nursery Tree and maintenance of Adult Tree
  - T – **Trees** of the fruits to be harvested
  - C – **Cracking** to produce Kernel from Inshell fruits
  - S – **Selection** of the Kernel measuring the calibre dimension
  - N – **Nursery** to produce Nursery Tree
- **Progressive ID**:
  - 1 – Main Facility
  - 2 – Secondary Facility

Plant & Storage Location definition

Plant & Storage Location definition

	PLANT		STORAGE LOCATOIN				Warehouse Type			
	ID	REGION	ID	Description	STORAGE TYPE	PRODUCTION TYPE	WM	HU	Scan	Interface with External DB
Brasil	BRPP	Parà	PIA1	Inbound Agricultural Nursery	RACK	AGRICULTURAL	X			X
			PIT1	Inbound Technical Materials	INBOUND	TECHNICAL MATERIALS	X			X
			PIF1	Inbound Fruits	INBOUND	FRESH FRUITS	X	X		X
			PWF1	WIP Fruits Grove	WIP	FRESH FRUITS				X
			PWT1	WIP Nursery	WIP	TREES				X
			SSF1	Silo Fresh Fruits	INBOUND	FRESH FRUITS	X			X
			POT1	Nursery Trees Outbound	OUTBOUND	TREES	X			X
			PIP1	Inbound Packaging	INBOUND	PACKAGING		X		X
			PWB1	Packing station	WIP	CLEANED FRUITS			X	X
			PWS1	Cleaning station	WIP	FRESH/CLEANED FRUITS			X	X
			PBS1	Buffer Fruits	BUFFER	CLEANED FRUITS	X			X
			POI1	Outbound Fruits in BOX	OUTBOUND	CLEANED FRUITS			X	X
			POI2	Outbound Fruits in BAGs	OUTBOUND	CLEANED FRUITS			X	X

Figure 14 - Plant & Storage Location definition

The facility that is placed into the region of Pará has been analysed performing several meetings with Facility Responsible, the Supply Chain Responsible, the General Manager, and General Managers of central Company Alfa.

The aim of these meetings was to obtain a final configuration that best reflects the reality of the plant into the ERP system.

There are **storage locations of inbound** for:

- Agricultural Materials for the cultivation of trees of Fruits
- Technical Material for the maintenance of the machinery used in the Owngrowing groove
- Fresh Fruits from the Owngrowing fields before the transferring into silos
- Fresh Fruits directly into silos
- Packaging used for the transportation after internal processes are concluded

Storage locations related to the production of:

- WIP Fruit Cracking
- WIP Nursery for the plant of Fruits under construction
- Cleaning station for the Fruits under cleaning and drying process
- Packing station for the Fruits under packaging station

Buffer storage location for the Fruits between WIP storage location and packing storage location.

Outbound storage locations for:

- Nursery trees sold to external clients and to other facilities of Company Alfa
- Fruits in BOX
- Fruits in BAGs

This segregation is useful to create the architecture of the ERP system and the successive handling of materials between all the storage locations.

3.5 Production Flow

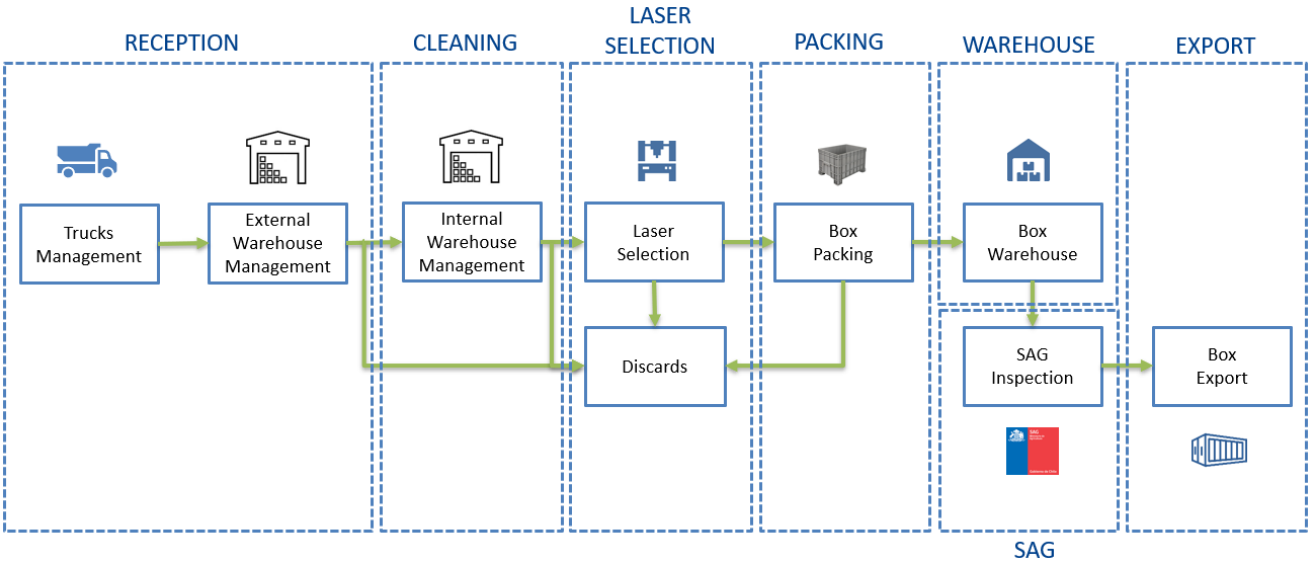


Figure 15 - Production Flow

The **production flow** represented in figure 15 aims to represent the complete flow of Fruits from the grove to the final exportation of the product cleaned, dried, and shelled.

The process begins with the stocking of fruits in external warehouses. Then the products are cleaned and the one that does not comply with quality standards are discarded. Fruits that pass this step of the process are then cracked and laser selected to differentiate the products by the quality level for successive production steps.

Selected Fruits are stocked in boxes within the box warehouse where SAG Inspection on international standards are performed for the successive permission of Export of the Boxes.

Material Supply Chain Flow – From Owngrowing facility

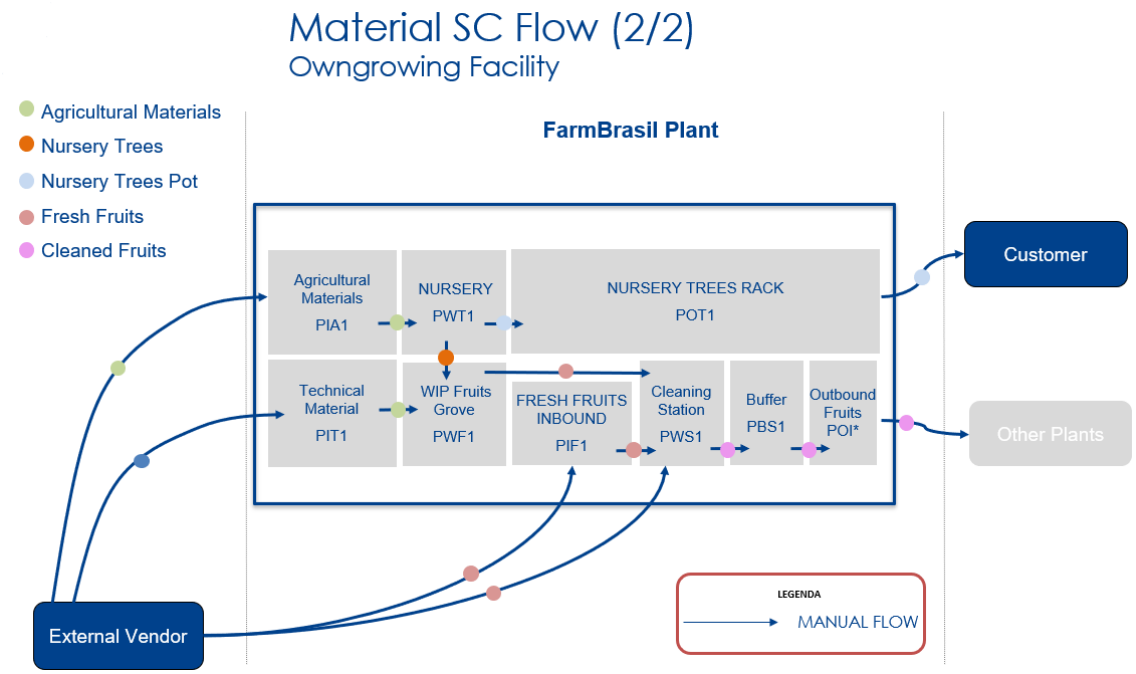


Figure 16 - Material Supply Chain flow

The scope of the figure 16 is to represent the **flow of the materials between the storage locations** of Owngrowing facility.

Agricultural materials are bought from external vendor and stocked within dedicated storage location and successively moved to Nursery storage locations. Nursery Tree produced can be planted into the groove or stocked in pot into the Nursery Trees Rack.

Technical Material are bought for the maintenance of machinery used into the Fruits Grove. Fresh Fruits can be produced or bought from external vendor. Then these **Fresh Fruits** need to be cleaned and dried and moved to the Outbound storage locations to be sold or moved in other plants for cracking process.

3.6 Inbound Process

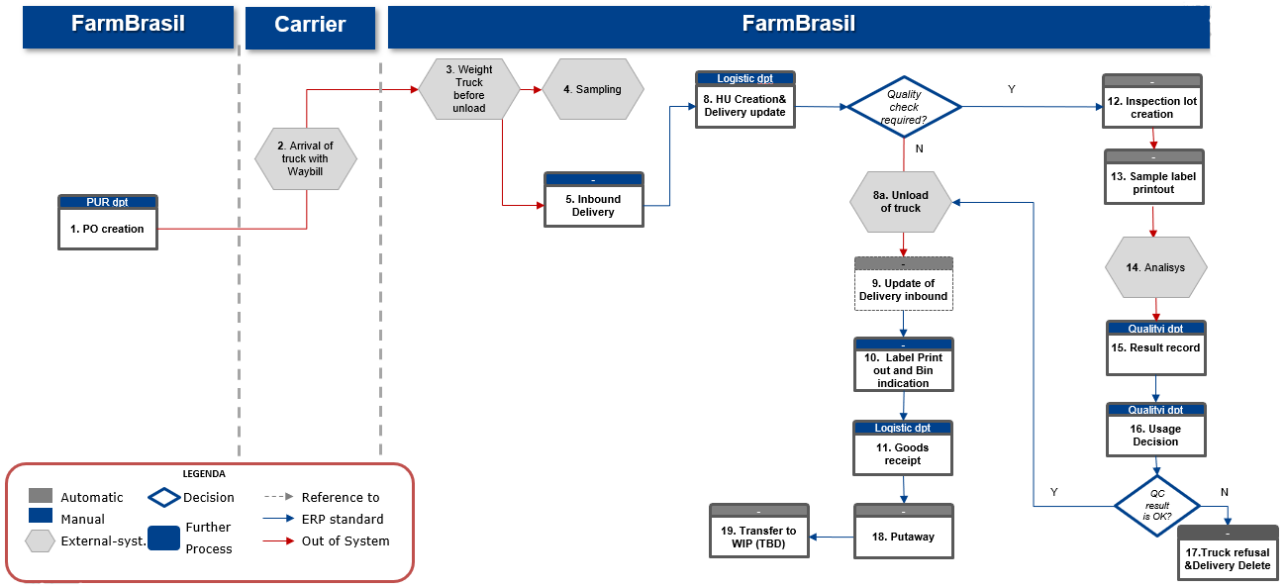


Figure 17 - Inbound Process

In figure 17 is represented an extraction from the Business Blueprint of the logistic processes related to the **inbound processes** that has been developed to track the TO BE flow.

As it is possible to observe two main actors are involved: FarmBrasil logistic department and the Carrier that executes the transportation.

A **Purchase Order** is created and transmitted to the vendor and the stock is transported to the facility of FarmBrasil with a truck. At the arrival the truck is weighted, and a **first sampling** is done on the stock transported to verify the integrity. If the sampling has negative result, then the stock is refused, and the truck is sent back to the vendor.

If the sampling has positive result, an Inbound Delivery document is created with creation of the respective Handling Unit and the update of the delivery within the ERP system.

At this point a **second sampling** is performed on quality compliance of the products. An **inspection lot** is created, and a label is attached to the lot sent to the laboratory where analysis is performed. The results are recorded on the ERP system and usage decision is taken: if the usage decision is “Refuse” the stock is refused and the truck is sent back to the vendor, otherwise the truck can be unloaded, the delivery inbound is updated with results of quality inspection lot.

An internal label is printed out and attached to the lot that will be stocked in bin indicated.

The **Good Receipt** is registered and the putaway of the goods is performed with the following transfer to the WIP storage location if required.

3.7 Internal Transfer: from BIN to WIP

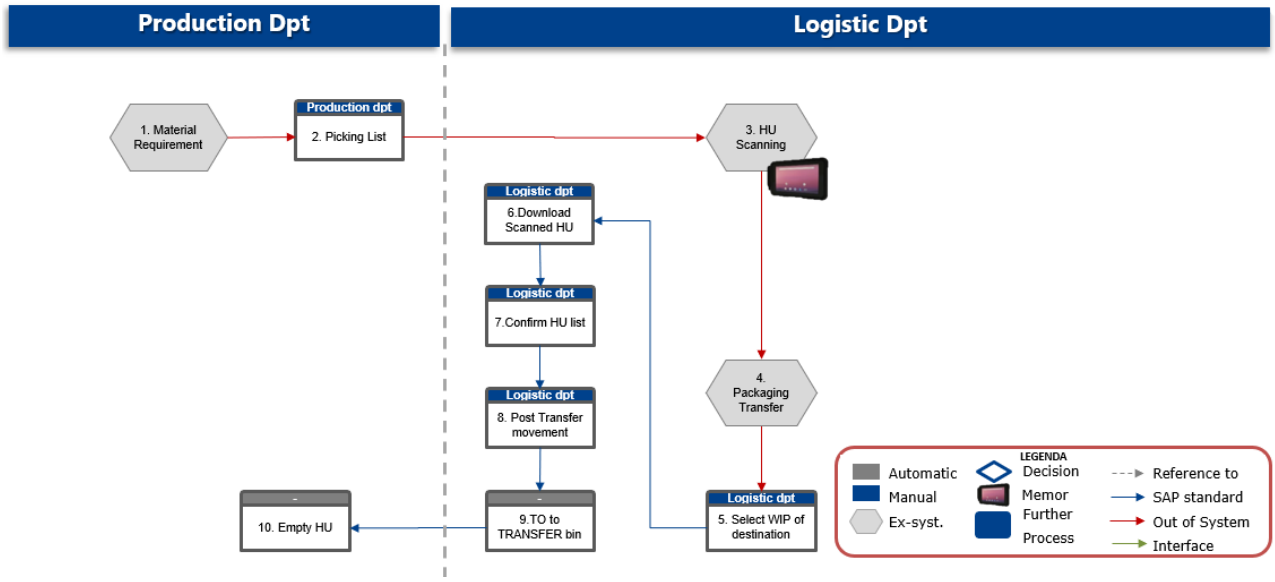


Figure 18 - Internal Transfer - From BIN to WIP

In figure 18 is represented an extraction from the Business Blueprint of the logistic processes related to the **internal transfer** of material that has been developed to track the TO BE flow.

As it is possible to observe two departments are involved within FarmBrasil: logistic department and production department.

Following **Material Requirement** of production department a picking list is created and sent to the logistic department. **Handling Unit** required are scanned and moved to WIP of destination. From ERP system point of view this process requires to select the WIP of destination and downloading of the scanned HU with the following confirmation of HU list.

After confirmation of HU the **Transfer Movement** is posted into the system with the automatic creation of a Transfer Order to transfer bin. Then the Handling is emptied.

3.8 Domestic & Export B2B and Industrial Sales Flow

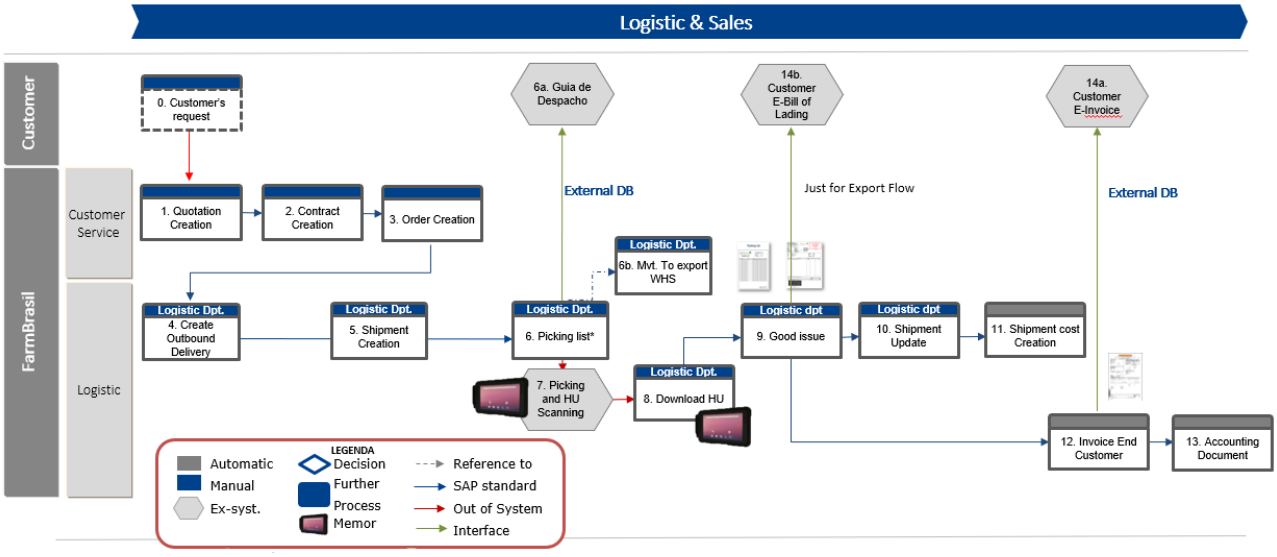


Figure 19 - Domestic & Export B2B and Industrial Sales Flow

In figure 19 is represented an extraction from the Business Blueprint of the logistic processes related to the **outbound processes** of material that has been developed to track the TO BE flow.

As it is possible to observe two main actors are involved: the **final customer** and **FarmBrasil**.

The Customer is responsible of the initiation of the process, and he interfaces with FarmBrasil for the creation of fiscal documents.

After the **request of the Customer,** the **Customer Service** of FarmBrasil process the request with the creation of contracts and orders for the Logistic Department.

At this point the **Logistic Department** create an **Outbound Delivery** with creation of shipment and picking list to be linked with fiscal document Nota Fiscal (with listed all the Handling Units associated to the shipment) and optional moving of the stock to the virtual export warehouse (for fiscal purposes).

HU listed within **picking list** are scanned and picked with the successive downloading from the system to create the Good Issue. In case of export an E-Bill of Lading is sent to the customer through official fiscal channel of transmission.

The last operation in charge of logistic department is the shipment update with automatic shipment cost creation.

The invoice is automatically sent to the Customer and accounting documents are automatically stored.

4. Literature review: Comparison between Maturity Models and OPM3 overview

Comparison of CMM, PMS-PMMM and P3M3 (P2MM) with OPM3

	CMM	PMS-PMMM	P3M3(P2MM)	OPM3
Model Dimensional	One-dimensional	Matrix	Matrix	Three dimensional: three domains, five processes and four stages
Feature	Stage model, no existing logic relation between different maturity levels.	Stage model	Stage model which can not provide a specific improvement path	Continuous model which develops a roadmap from low level to high level management maturity.
Focus Areas	Software management process	Project management nine knowledge areas	Organizational culture and knowledge management besides project management process	SMCI BP and OE (structural, cultural, technological and human-resource) BP
Assessment System	Software process maturity evaluation method, capability maturity key practice and software process maturity questioning list	Software process maturity evaluation method, capability maturity key practice and software process maturity questioning list	Maturity model handbook, assessment questioning list, omitting maturity model introduction	Knowledge, Assessment and Improvement in a closed circulation

Table 3 - Comparison of CMM, PMS-PMMM, P3M3 with OPM3

The **Capability Maturity Model (CMM)** [5] was initially conceived and introduced by Watts Humphrey, at the time he worked at IBM for the Ministry of Defence, with the help of a group of software professionals. At the explicit request of the Ministry, the model was then acquired, developed, and sponsored by the Carnegie Mellon University - Software Engineering Institute (SEI).

The SEI / CMM development model starts from the assumption that the quality of the software strongly depends on the process used for its development and for the subsequent maintenance.

In a nutshell, the model is the common-sense application of the best process management and quality improvement techniques. It is based mainly on:

- common guidelines for software development and maintenance;
- structure for the consistent assessment of the levels achieved.

The main purpose of adopting the SEI / CMM model is to improve the software development processes with a view to:

- improvement of the quality of the software produced;
- increase in the productivity of the development organization;
- reduction of development times (reduction of the software life cycle).

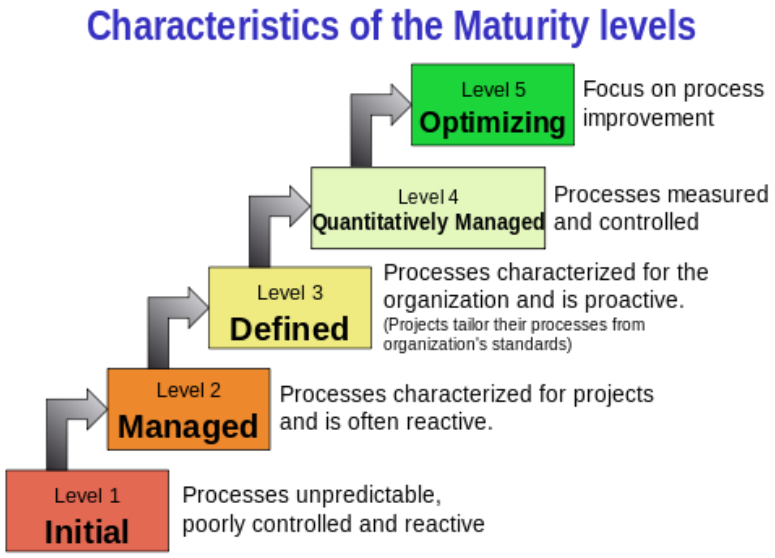


Figure 20 - PMS schematization

The context of **Performance Management System (PMS)**, in broad terms, refers to the nature of the organization or the part of the organization which the PMS is attempting to control. It also refers to the channels through which the PMS attempts to achieve the aspirations it has through the organizations or parts of organization that it is trying to control. These two contextual elements are depicted in the figure below.

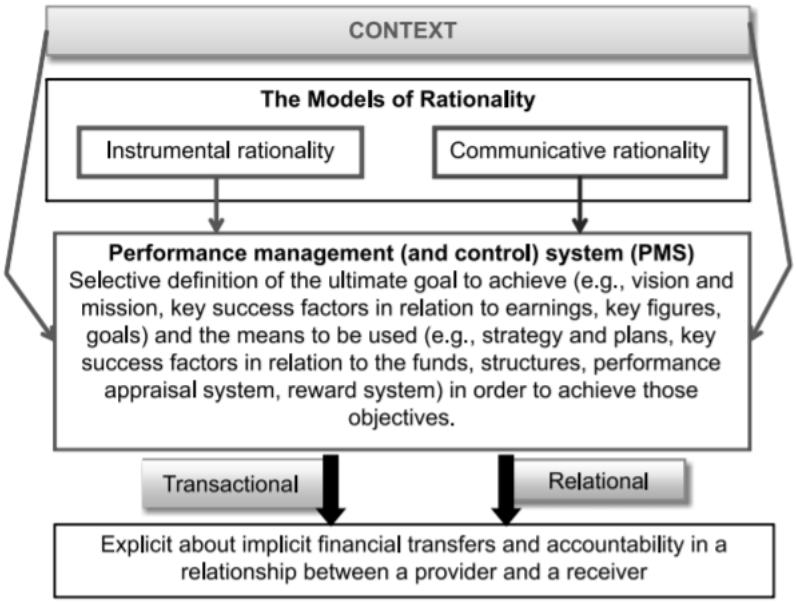


Figure 21 - Models of rationality - PMS

According to the model of the Performance Management System, the organization's external and internal environments constitute a context in which an organization is acting. It decides about potential opportunities and challenges when the organization needs to make a choice whether to respond to these challenges. The contextual presumptions are deeply anchored in the organization's history [4].

P3M3 is the Axelos Portfolio, Program, Project (P3) Management Maturity Model (M3) and it is a way of measuring the capability of an organization, or part of the organization to deliver portfolios and / or programs

and / or projects in a repeatable way - the more mature the capability, the more likely it is to deliver consistent and predictable results.

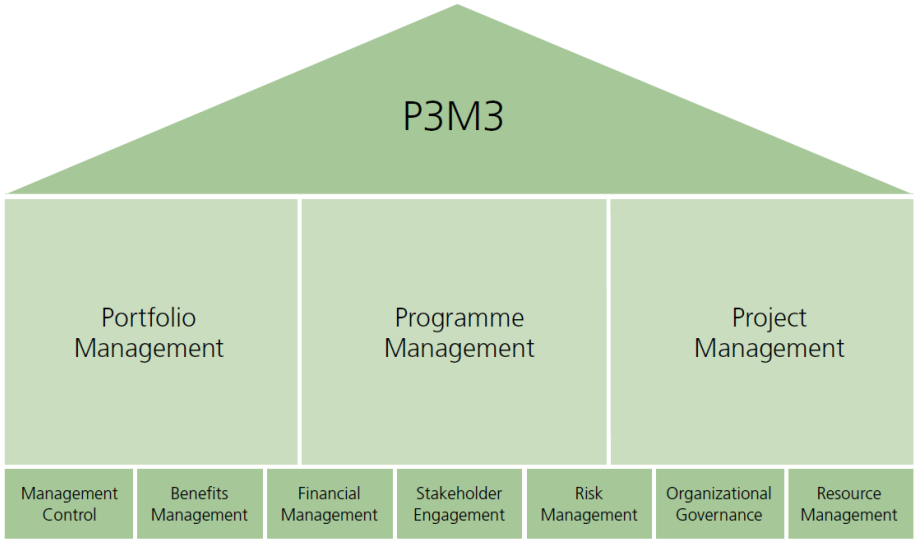


Figure 22 - P3M3 schema

The P3M3 approach is based on developments from the US Department of Defence and subsequent improvements by Carnegie Mellon University that have been used to measure the maturity of different types of capability - software development, processes, people and of course P3 delivery management.

P3M3 was commissioned from industry exports by Axelos, previously the UK Government's Cabinet Office [3].

OPM3 Organizational Project Management Maturity Model

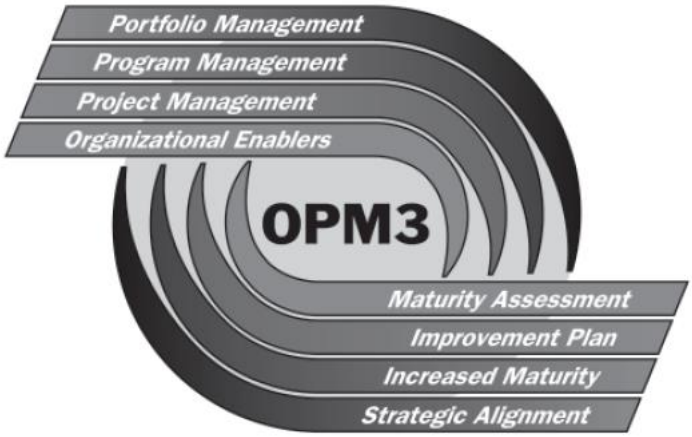


Figure 23 - OPM3 Domains and SMCI

OPM3 is a project maturity model based on the Project Management Institute (PMI) standards for Project, Program and Portfolio management. OPM3 aligns these standards within a context of organizational strategic planning and execution. The model is comprised of accumulated project management practitioner knowledge, Best Practices, and a disciplined, repeatable process for assessing organizational project management maturity to guide improvements.

OPM3 provides a model for improvements in maturity, which will enable an organization to execute the strategies successfully by adopting a structured Project, Program and Portfolio (PPP) management approach appropriate to the organization's size, industry type and culture.

It is therefore a question of the systematic and aligned management of projects, programs and portfolios with the strategies and objectives of the organization.

The concept of Organizational Project Management is based on the idea of close correlation between the ability of the organization to manage projects and the effectiveness in developing its strategies and in achieving the goals. This ability is assimilated to the skill in effectively adopting the Best Practices of the sector.

OPM3 is a standard defined by the Project Management Institute (PMI) [6].

The improvement of the management skills of the three domains (Project, Program, Portfolio) is developed according to four components: Standardization, Measurement, Control and Continuous Improvement as shown in the following figure.

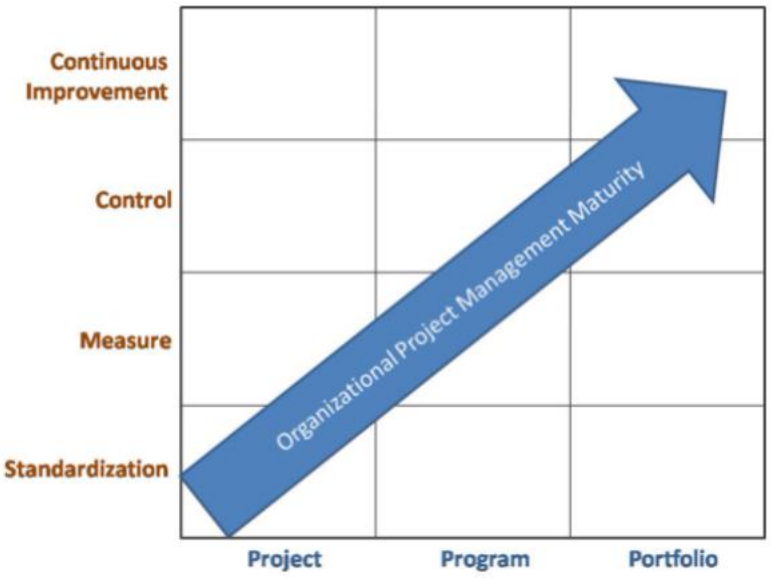


Figure 24 - Domains and SMCI chart

The best practices indicated by the OPM3 model can be grouped into two main categories:

- **SMCI Best Practice**: these are practices relating to standardization, measurement, control and continuous improvement;
- **Organizational Enablers (OE)**: these are practices that facilitate the adoption of other practices.

Project Management - Involves the processes relating to individual projects and the skills of the personnel involved at different levels, in the management of the project. It is the main domain and forms the basis for the other two domains. The processes are presented in the PMBOK Guide in the following five groups:

- Initiating Processes
- Planning Processes
- Executing Processes
- Monitoring and Controlling Processes
- Closing Processes

Program Management - The second domain refers to the management of the program understood as a set of several projects managed in a unitary and coordinated manner to obtain benefits that are not possible in a different way.

In addition to projects, a program may also contain other activities that are not strictly related to the projects.

Furthermore, Program Management has two attributes that differentiate it from Project Management: (1) Multi-Project Management and (2) Operational elements such as, for example, the management of the post-release of the products or services created.

The management of the program, therefore, can cover the entire life cycle of a product or service from its conception to its realization, release, evolution and final withdrawal from the market.

In the multi-project context, management focuses on the coordination of activities in order to share objectives, benefits and expectations common to all projects.

Project Management, therefore, is based on the five groups of Project Management processes focusing on the following key coordination activities:

- Management of stakeholder expectations at program level;
- Ensuring that program objectives support portfolio strategies;
- Prioritization of projects within the program and of the necessary resources according to availability;
- Coordination of the activities assigned to the various project managers and working groups;
- Management of the program scope that encompasses the various project areas;
- Conflict management between projects to achieve the organization's goals;
- Adherence to the assignment of responsibilities and authorities relating to the communication and performance of activities;
- Management of the production of the expected benefits.

The complexity of Program Management consists in having to coordinate the typical activities of Project Management in relation to all the projects present in the program.

Portfolio Management - The third domain concerns the decentralized management of the portfolio of programs, projects and other activities that we decide to fear together in order to ensure a consistent and constant alignment with strategies and objectives. The elements of the portfolio may therefore not be directly related but share common objectives and strategies.

Portfolio Management also follows the five groups of typical processes of Project and Program Management: Initiating, Planning, Executing, Monitoring and Controlling, Closing focusing, this time, on specific portfolio management activities of projects, programs and other activities such as:

- Portfolio identification;
- Assignment of priorities;
- Authorization;
- Management;
- Check.

Portfolio Management includes two distinct groups of dedicated processes:

- Aligning Process Group;
- Monitoring and Controlling Process Group.

The main activities of Portfolio Management from an organization's point of view include:

- Translation of strategies into specific initiatives or business cases that become the basis for projects and programs;
- Launch of projects and programs;
- Research, allocation and making available of the necessary resources for the projects, programs and other planned activities;
- Maintaining a fair balance of the portfolio;
- Support to the organization's project management environment.

There is a sort of hierarchy between the improvement of Project Management processes, the Program Management processes and the Portfolio Management processes. In fact, this hierarchy requires that the processes related to project management be improved first, then those related to program management and finally those related to portfolio management.

Below, an example of maturity level in Project, Program and Portfolio domains.

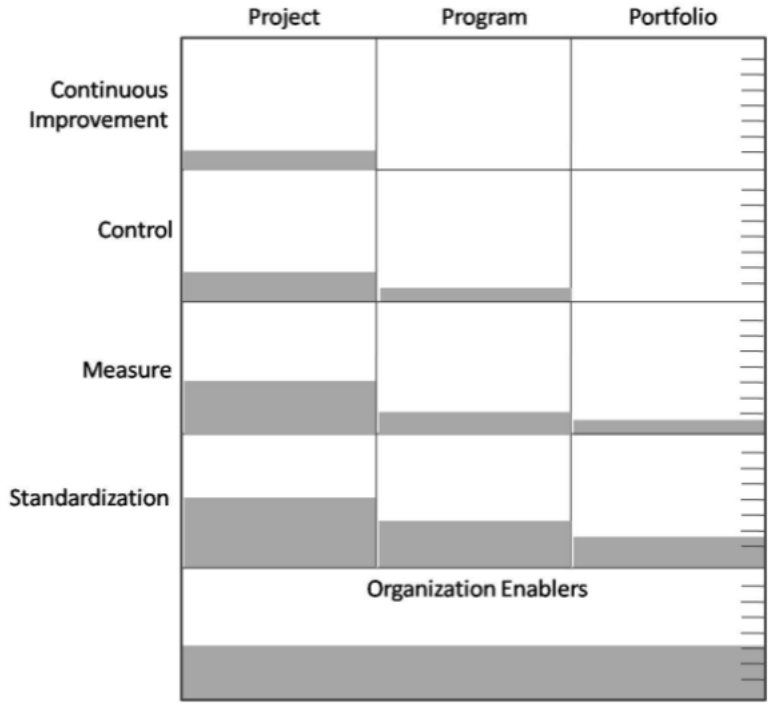


Figure 25 - Domains and SMCI evaluation

5. OPM3 Self-Assessment Questionnaire

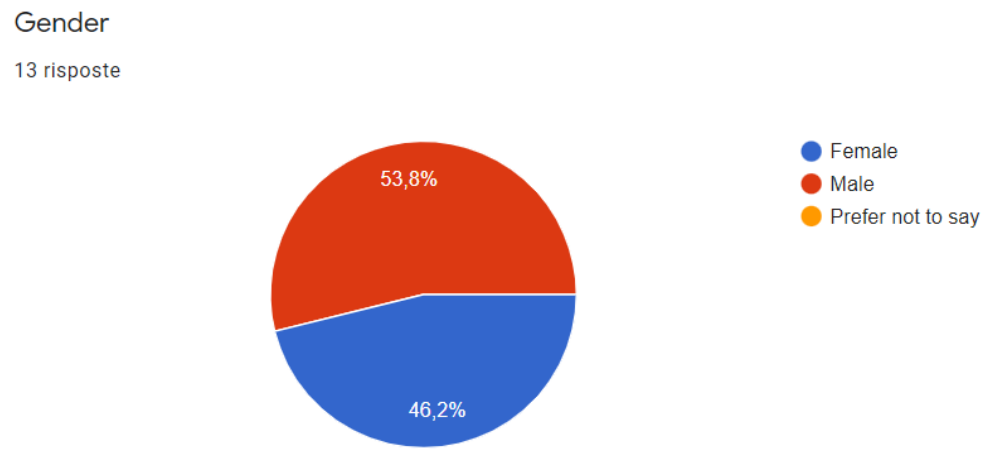
It has been developed a questionnaire for the evaluation of maturity level on selected Best Practices and Organizational Enablers, focusing mainly on Project Domain. Questionnaire is attached in annex 9.1 “OPM3 Knowledge Self-Assessment – Questionnaire”. For simplicity it has been only reported the results of the questionnaire in this chapter. To view the structure of questionnaire, see annex 9.1 “OPM3 Knowledge Self-Assessment – Questionnaire”.

The questionnaire has been filled by analyst, consultant, senior consultant, manager and director involved in the project analysed.

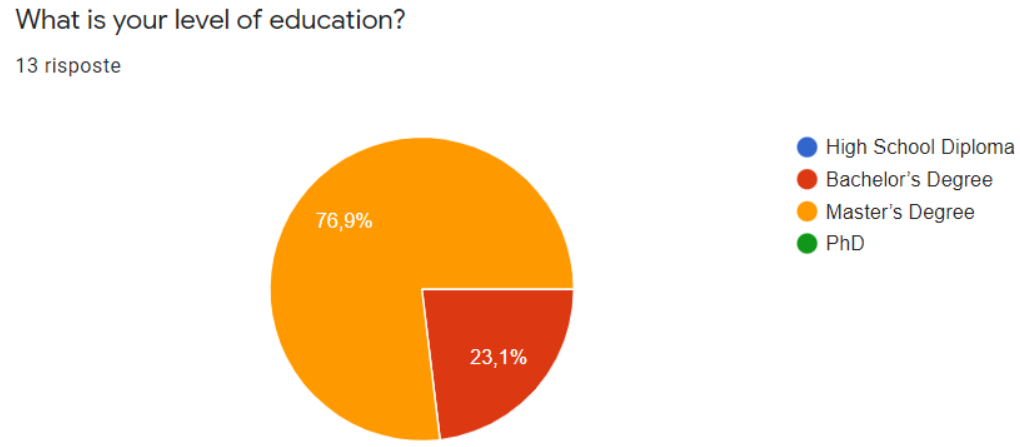
Total number of answers gathered: 13

Below the results.

About the interviewee.



Graph 1 - Gender segregation



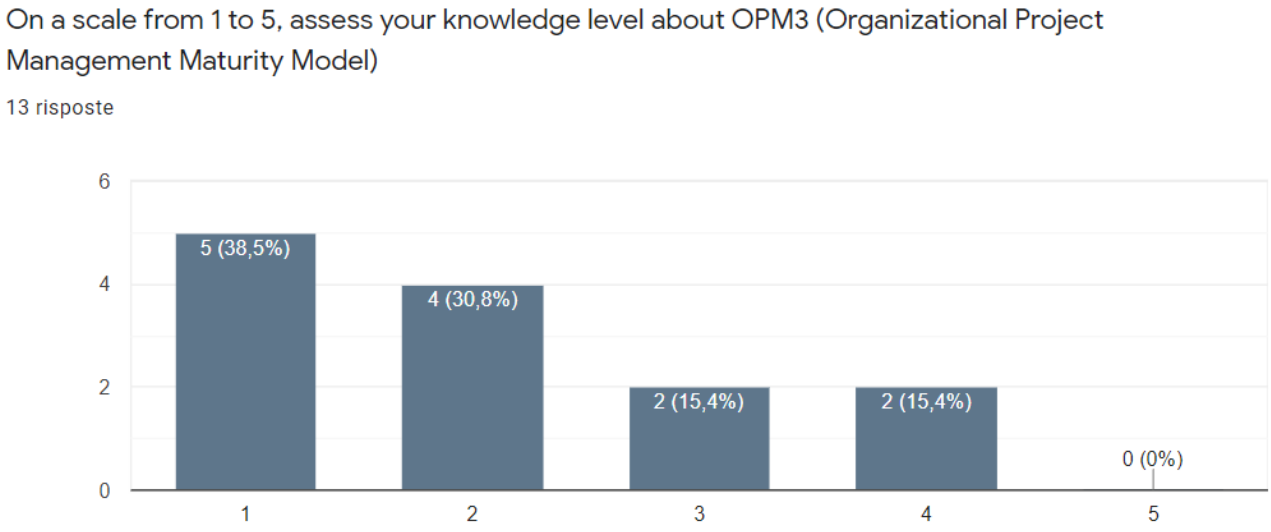
Graph 2 - Assessment on education level

We can observe that gender male and female are balanced. It is important to consider that most of the sample is composed by grade under Manager level. From these data we can only make observation on gender

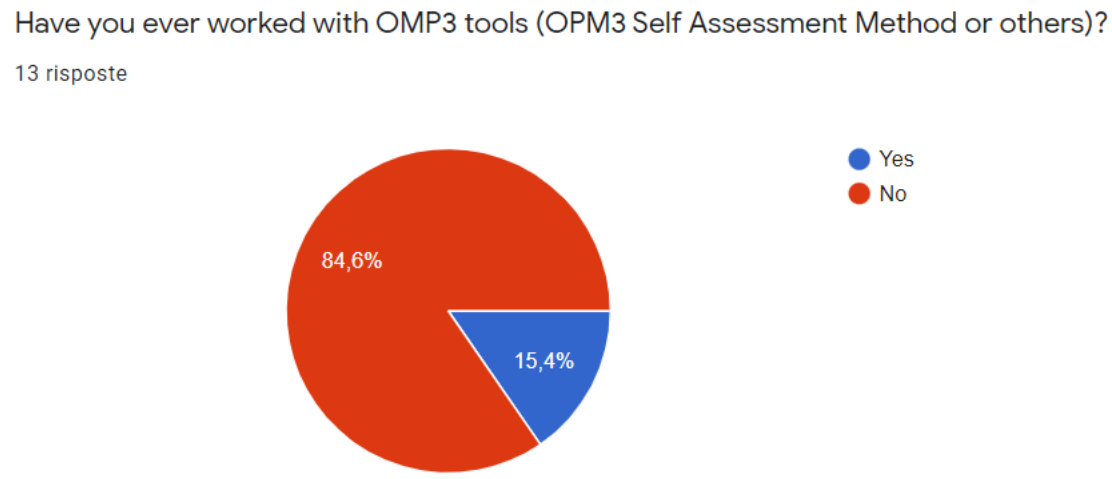
balance within the team at general level and not on segregated levels (e.g. high grade level) because of a sample too small.

Level of education is splitted up between Master graduated (77%) and Bachelor graduated (23%).

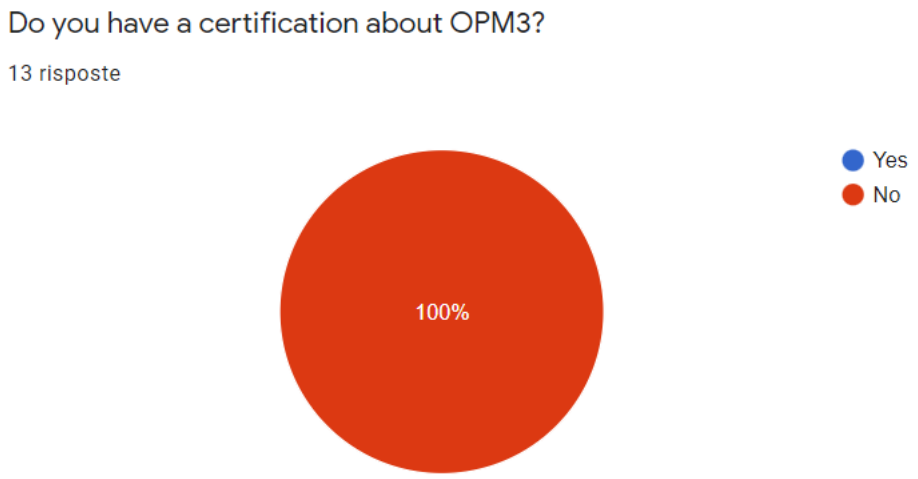
General knowledge assessment about OPM3.



Graph 3 - OPM3 Knowledge Assessment



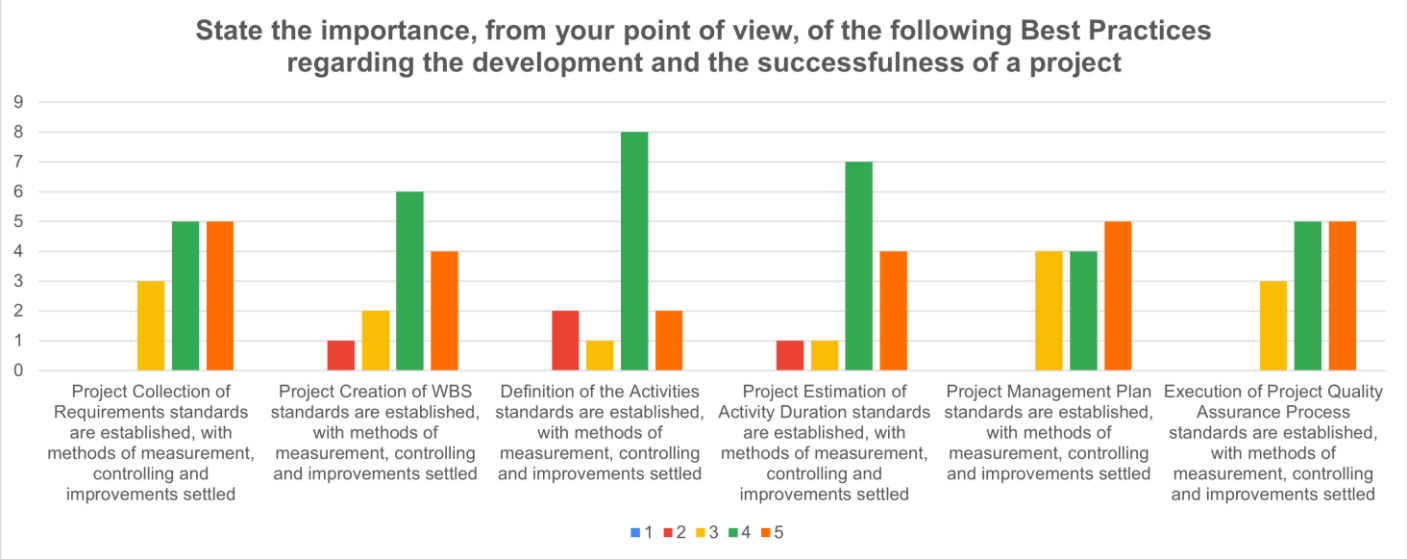
Graph 4 - OPM3 Tools assessment



Graph 5 - OPM3 Certification assessment

From knowledge assessment of OPM3 we can observe that knowledge about OPM3 is very low. Almost 15% of the consultants has worked with OPM3 tools and no one has a certification about OPM3.

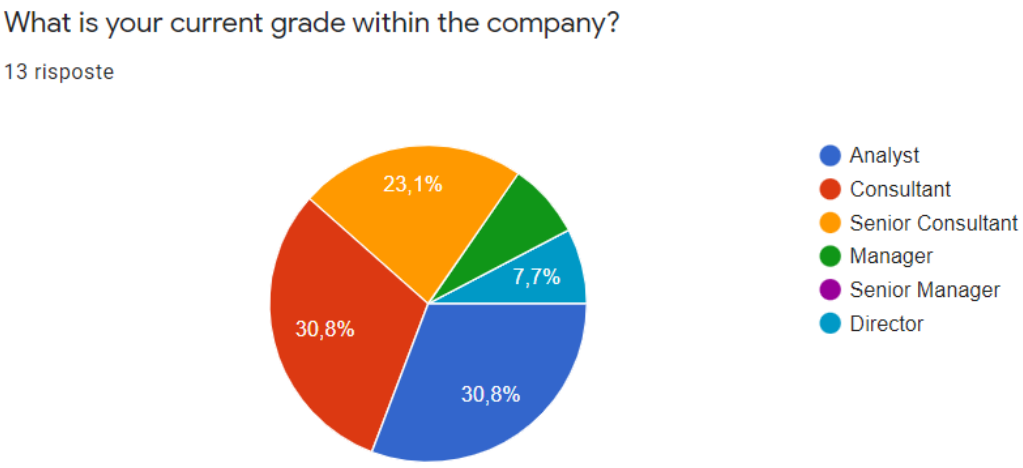
Best Practice assessment and Grade within the IT Company



Graph 6 - Best Practice assessment

We can observe that is always considered important the exploitation of best practices.

Another interesting observation is that it is important to set a best practice but not as a unique way to develop the project. Flexibility is always fundamental capability required in all aspects of a project.



Graph 7 - Grade assessment

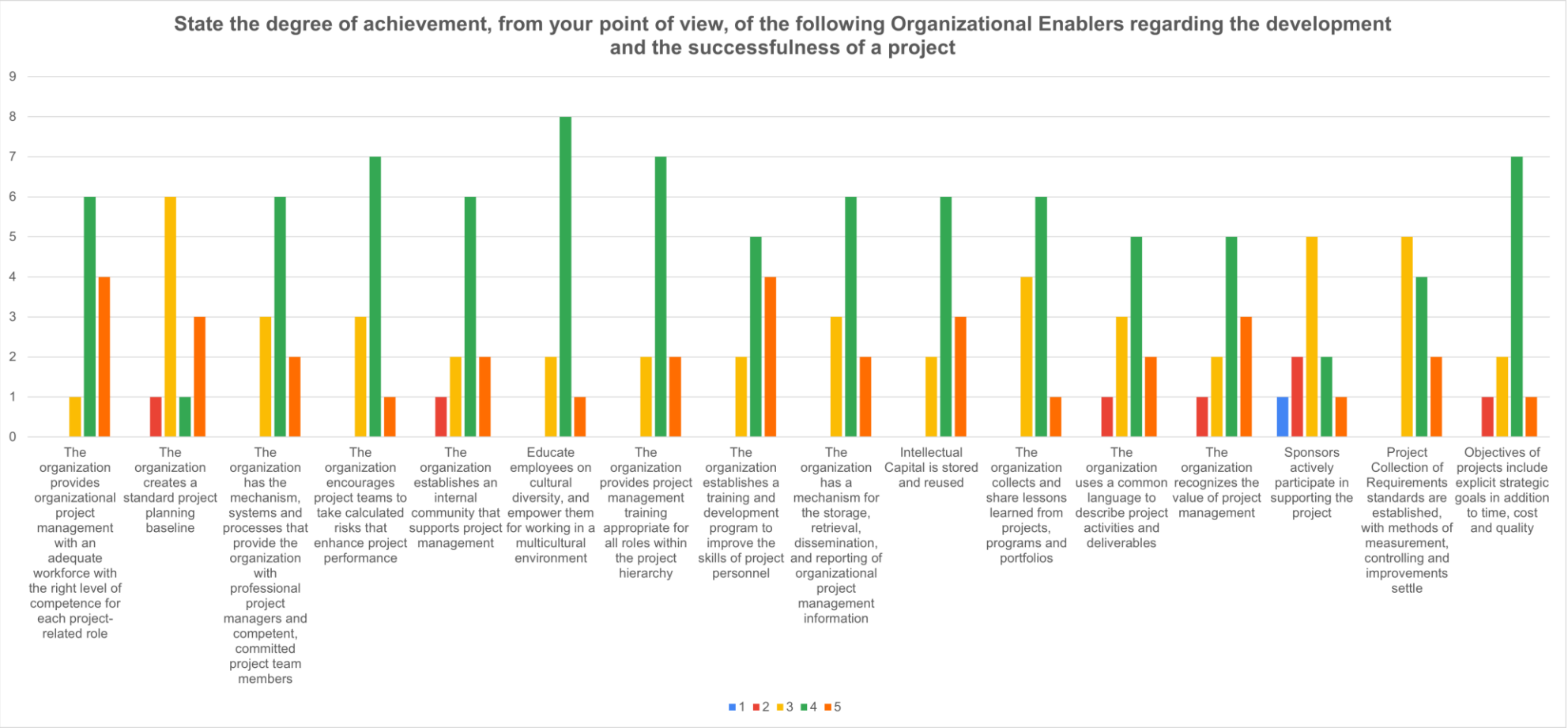
The sample analysed is composed as following:

- 4 Analyst
- 4 Consultant
- 3 Senior Consultant
- 1 Manager
- 1 Director

The analyst is the junior figure of the team, a consultant has usually from 1 year to 5 years of experience on the field, a senior consultant has usually from 5 year to 10 years of experience on the field.

A manager needs to be trained with tailored training more than experience on the field. The successive grade after the manager is the senior manager that manages a set of projects. The director is involved in the formulation of offers for new projects and into the management of a set of projects.

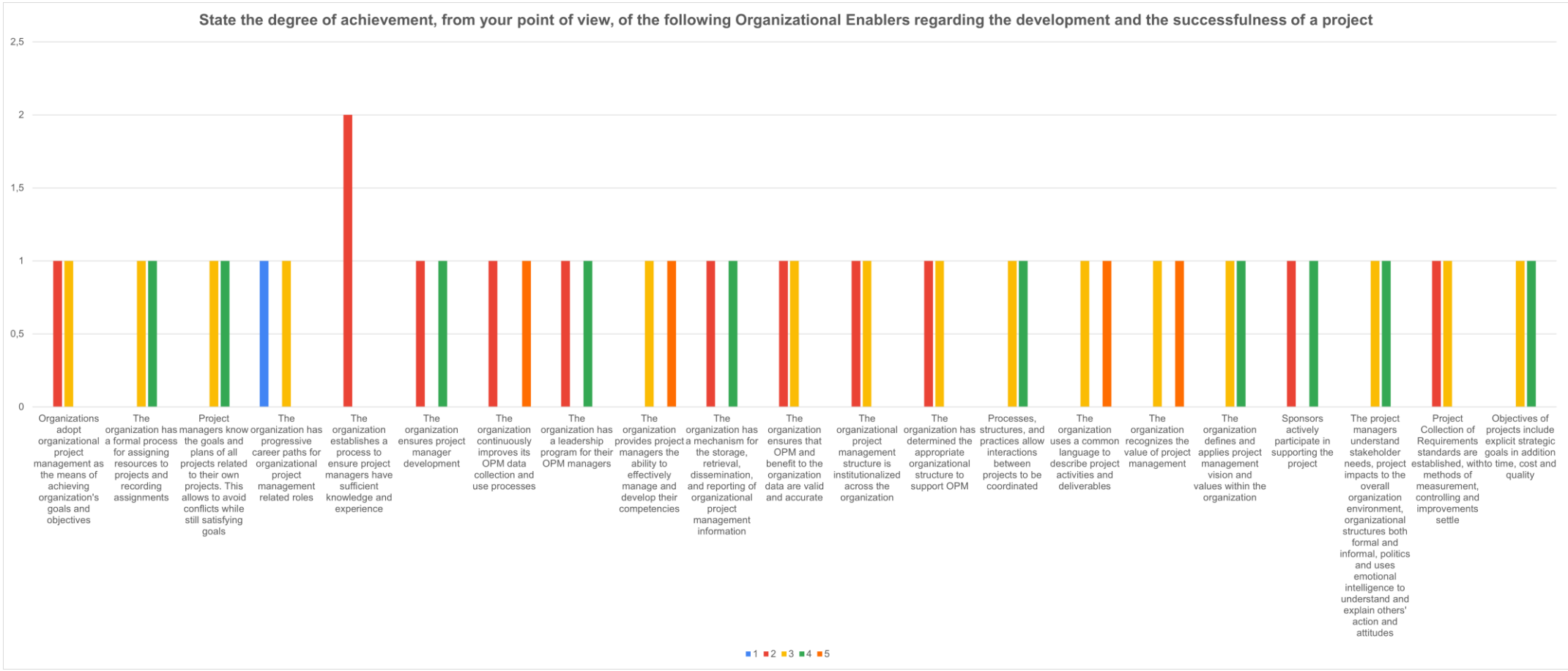
ORGANIZATIONAL ENABLERS AND THEIR DEGREE OF ACHIEVEMENTS (Analyst, Consultant, Senior Consultant point of view)



Here, an overview of the assessment done by analyst, consultant and senior consultant, about the Organizational Enablers focused on organizational structure.

See annex 9.1 “OPM3 Knowledge Self-Assessment – Questionnaire” to view the segregation.

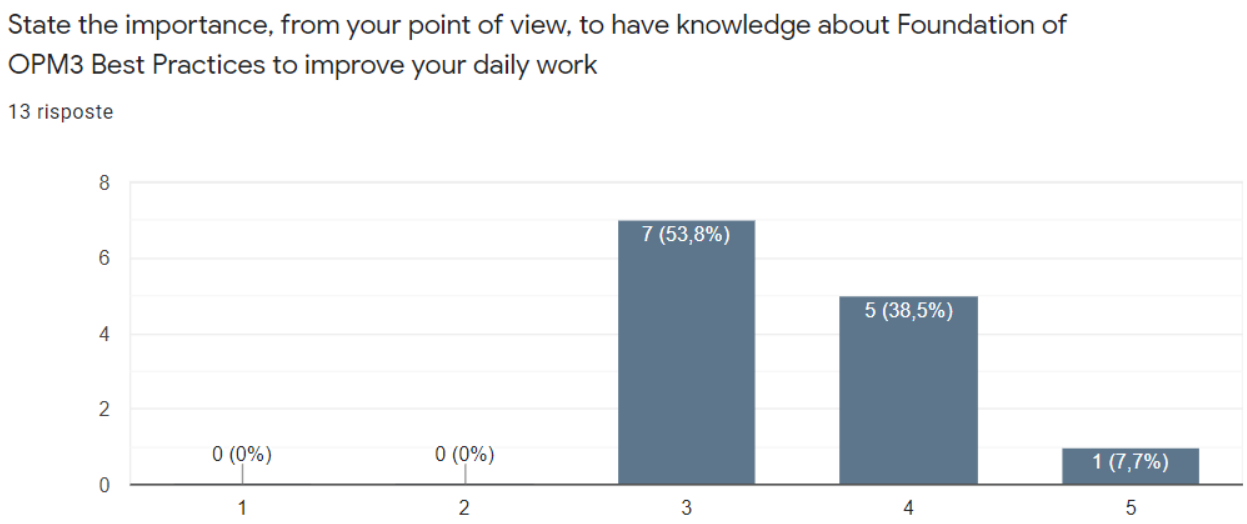
ORGANIZATIONAL ENABLERS AND THEIR DEGREE OF ACHIEVEMENTS (Manager and Director point of view)



Here, an overview of the assessment done by manager and director focused on management Organizational Enablers.

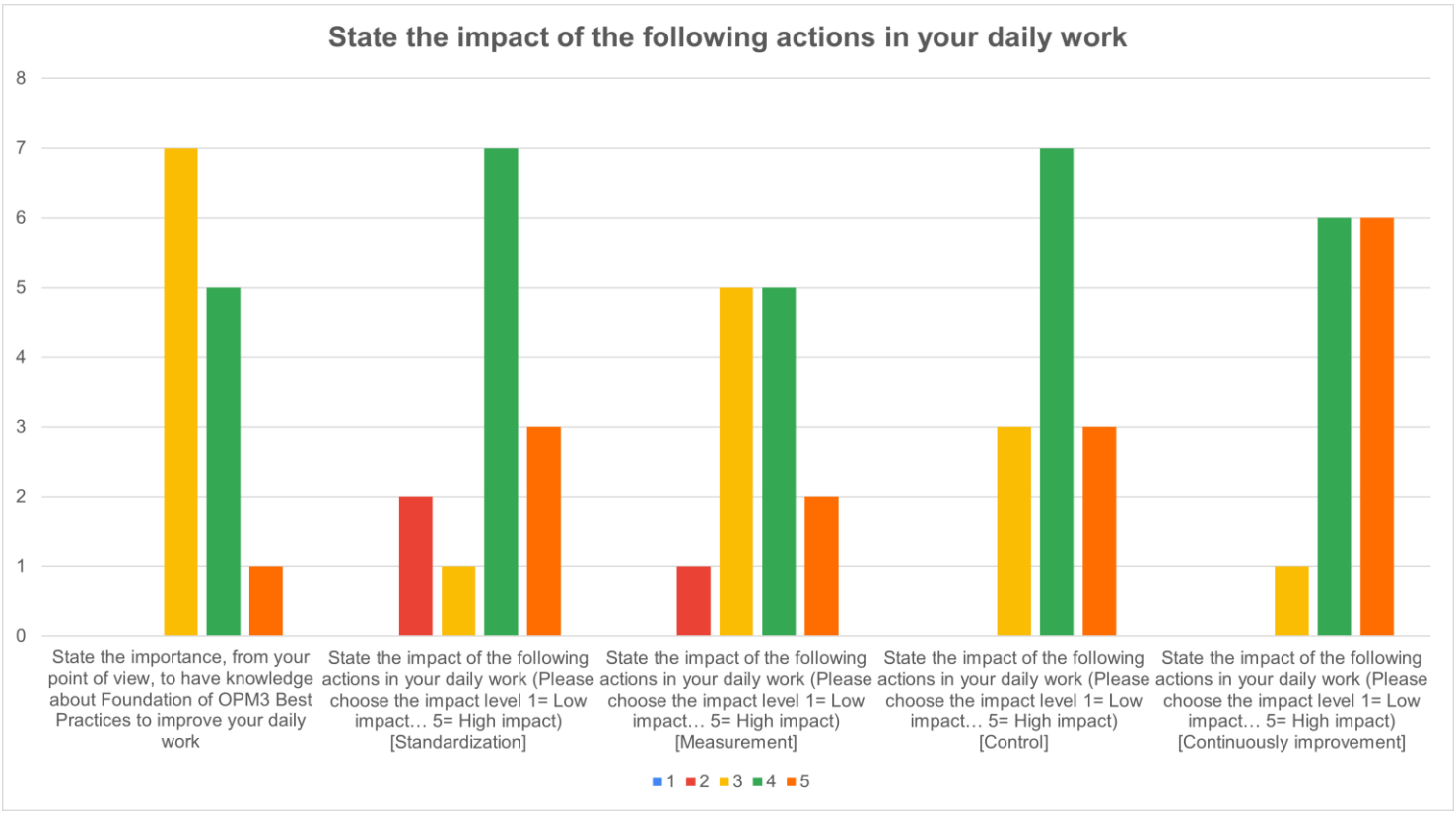
See annex 9.1 “OPM3 Knowledge Self-Assessment – Questionnaire” to view the segregation.

Assesment about the impact of Standardization



Graph 8 - Impact of standardization

More than one half of the interviewee expect a discrete improvement in daily operations.



Graph 9 - Impact of standardization on daily work

Analysis and impact assessment of the following actions:

- From results about "**importance to have knowledge about Foundation of OPM3 Best Practices to improve daily work**" we can observe that is considered a practice of relative importance.

This result has been further analysed. Further questions to understand the cause of this relative importance of OPM3 Best Practice has been done to interviewee. Best practices listed within OPM3 Knowledge Foundation can be considered as a baseline to develop tailored Best Practice. Within the IT Company has been structured an office for development and formalization of best practices. Otherwise it is difficult to apply the AS IS OPM3 Best Practices;

- **Standardization** has great impact on daily work. Standardization of repetitive activities allows to minimize reworks;
- **Measurement** has relative impact on daily work. It is fundamental from a management perspective in projects with a long-time span to track execution of activities and to understand if an activity is on the track or need to be addressed (see Annex 9.2 “Openpoint Pivot Tracking Table” to view an example of measurement tool);
- **Control** is considered an important action to be performed. During the testing phase (see paragraph 3.3.4 Realize – Test) the system developed during the previous phases is tested before by IT Consultant and successively by Key User. This is carried out for a validation from the client for a formal validation of the processes (see Annex 9.3 “Activity Pivot Tracking Table” to view an example of controlling tool);
- **Continuously Improvement** is considered a fundamental aspect that characterize the industry of consultancy. The figure of consultant never stops to improve himself learning by-doing on-the-field and obtaining licenses.

6. Individual Competence Baseline

The goal of this chapter is to **analyse the individual's competence** in project, portfolio and programme management. To perform this analysis has been used as source and mastery of these management domains the IPMA ICB® (International Project Management Association Individual Competence Baseline) [7].

The **individual competence** is the application of knowledge, skills and abilities in order to achieve the desired results.

Knowledge is the collection of information and experience that an individual processes. For example, is the understanding the concept of a Gantt chart might be considered knowledge.

Skills are specific technical capabilities that enable an individual to perform a task. For example, being able to build a Gantt chart might be considered a skill.

Ability is the effective delivery of knowledge and skills in each context. For example, being able to devise and successfully manage a project schedule might be considered ability.

These three terms are related in that having a skill presupposes some relevant knowledge. Having ability presupposes relevant skills and knowledge, but adds to that the use of these in practice, in the right manner and at the right time.

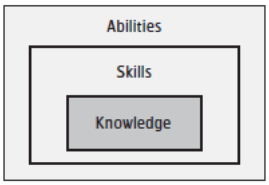


Figure 26 - Abilities, skills, knowledge segregation

IPMA recognises competence today as a function of the individual, the team and the organization:

- **Individual competencies** address the knowledge, skills and abilities through experience;
- **Team competencies** address the collective performance of individuals joined towards a purpose;
- **Organisational competencies** address the strategic capabilities of a self-sustaining unit of people.

The eye of competencies represents the universe of competencies for project, programme and portfolio management. Competencies are divided into three areas: **Perspective, People and Practice**.
Areas provide focus for the aspects of competence and together create the whole, balanced individual.

The **framework of IPMA ICB** has the following characteristics:

- Segregation in **domains**, splitted in project management, programme management, and portfolio management;
- **Competence areas** that apply equally to all three domains. The three competence areas are as follows:
    - People competencies that consists in the personal and interpersonal competences required to successfully participate in or lead a project;
    - Practice competencies that are specifics methods, tools and techniques used in all domains;
    - Perspective competencies, under this heading come the methods, tools and techniques through which individuals interact with environment.

Within each competence area there are generic **Competence Elements** (CEs) that apply to all domains. CEs contain list of the pieces of knowledge and skills required to master the CE. **Key Competence Indicators** (KCIs) provide the definitive indicators of successful project, programme and portfolio management for one, two or all domains.

It has been performed a brief analysis on perspective and people competence area to highlight main aspects that has tangible impacts on projects.

6.1 Perspective Competence Area

The competence area 'perspective' deals with the context of a project.

The **strategy** competence describes how strategies are understood and transformed into manageable elements using projects. This encompasses the discipline of strategic performance management in which an organization breaks up its strategic goals into manageable elements in order to:

- Achieve beneficial changes;
- Establish and pursue agreed strategic targets;
- Allocate and rank resources;
- Inform management of the need to change strategic objectives;
- Stimulate continuous improvement.

Each project is controlled through a set of Critical Success Factors and Key Performance Indicators to assure the sustainability of an organization. Here a summary of the main Critical Success Factors:

- Alignment with organizational mission and vision;
- Identification and exploitation of opportunities to influence organizational strategy;
- Developing and ensuring the ongoing validity of the business / organizational justification;
- Determine, assess and review critical success factors;
- Determine, assess and review key performance indicators.

The **governance**, structures and processes competence element define the understanding of and the alignment with the established structures, systems and processes of the organisation that provide support for the projects and influence the way they are organized, implemented and managed. The governance, structures and processes of an organization may comprise both temporary systems (such as projects) and permanent systems (such as programme and portfolio management systems).

The purpose of this competence element is to enable the individual to effectively participate in and manage the impact of governance, structures and processes on projects.

Structures and processes are an essential part of the governance system of any organization. To align with structures and processes means the ability to utilize value systems, roles and responsibilities. Example of supporting structures and processes are line functions such as human resources (HR), finance and control and IT. Mature project organisation may also provide more dedicated support to project management through a project management office (PMO).
A key challenge is to **balance the use of compulsory and optional structures** and processes for optimal effect and benefit to the project.

Here a summary of the main Critical Success Factors:

- Knowledge of the principles of project management and the way in which they are implemented;
- Knowledge of the principles of programme management and the way in which they are implemented;
- Knowledge of the principles of portfolio management and the way in which they are implemented;
- Alignment of the project with supporting, Human Resources, finance processes and functions;

- Alignment of the project with the organization's decision-making and reporting structures and quality requirements.

The **compliance, standards and regulations** competence element describe how the individual interprets and balances the external and internal restrictions in each area such as country, company or industry. Compliance requirements operate on a spectrum from voluntary and informal to mandatory and formal. **Standards and regulations** influence and define the way projects should be organized and managed to be feasible and successful. Example of standards are ISO Standards or IPMA for professional standards, example of regulation are the law systems involved.

The **culture and values** competence element describes the individual's approach to influence on the organization's culture and values and the wider society in which the project is situated. It also includes the acknowledgement by the individual participating in or leading a project of the consequences of these cultural influences for the project and how to incorporate this knowledge in the management of the project.

Organizations are social systems, where personal behaviour is embedded in a social context of shared culture. This culture has formal, explicit origins and aspects (such as the organization's explicit mission and corporate values) as well as informal more implicit aspects.

6.2 People Competence Area

Self-reflection is the ability to acknowledge, reflect on and understand one's own emotions, behaviours, preferences and values and to understand their impact.

Self-management is the ability to set personal goals, to check and adjust progress and to cope with daily work in a systematic way. It includes managing changing conditions and dealing successfully with stressful situations.

People competence area is linked to all the other competence elements. Key competence indicators of this area are:

- **Identification and reflection** on the ways in which own values and experiences affect the work;
- Building of **self-confidence** based on personal strengths and weaknesses.

The delivery of projects benefits involves making many individual commitments to get things done. Individuals must demonstrate **personal integrity and reliability** because a lack of these qualities may lead to a failure of the intended results. Personal integrity means that the individual is acting in accordance with his or her own moral ethical values and principle. Reliability is acting dependably, according to expectations and/or agreed behaviour.

Personal communication describes the essential aspects of effective communication. Both the content and the means of communication (tone of voice, channel and amount of information) must be clear and appropriate for the target audience. The individual must verify the understanding of messages by actively listening to the target audience and seeking feedback. The individual promotes open and sincere communication and can use various means for communication (e.g. presentations, meetings, written forms, etc) and acknowledge their values and limitations.

Nowadays, it is important to communicate effectively with **virtual teams**. A virtual team consists of individuals who work across time zones, space and/or organisational boundaries. Communication within virtual teams is a challenge, as not all are in the same environment and/or organisation and they may be distributed over several organisations, cities, countries or continents.

Communication between virtual team members is often asynchronous and not face-to-face and has to use **modern communication technology**. The communication procedures must consider aspects such as language, channel, content and time zones.

To achieve concrete results from working with virtual teams it is fundamental to use modern communication technology such as tele-conferences, chat and cloud computing. The definition **of clear communication processes** and procedure of promotion of **cohesion and team building**.

Another aspect of team working is the **employ humour** and sense of perspective when appropriate. Work in projects can often be stressful. Being capable of viewing situations, problems and even your own work from different viewpoints is an important asset.

Within a team it is required **leadership**, that means providing direction and guidance to individuals and groups. It involves the ability to choose and apply appropriate styles of management in different situations. Besides displaying leadership with his or team, the individual needs to be seen as a leader in representing the project to senior management and other interested parties.

A **leader** has the capability to exert appropriate power and influence over others to achieve the goals and prove direction, coaching and mentoring to guide and improve the work of individuals and teams.

Through **teamworking** it is possible to bring people together to realise a common objective. Teams are group of people working together to realise specific objectives. Project teams are commonly multi-disciplinary: specialists in different disciplines work together to realise complex outcomes. Teamwork is about building a productive team by forming, supporting and leading the team. Team communication and team relationships are among the most important aspects of successful teamwork.

Management and solving of conflict and crisis by being observant of the environment and noticing and delivering a remedy for disagreements. Conflicts and crises may include events and situations, character conflicts, stress levels and other potential dangers. The individual must handle these scenarios appropriately and stimulate a learning process for future conflicts and crisis.

Last aspects analysed in People Competence Area is the **result orientation** that is the critical focus maintained by the individual on the outcomes of the project. The individual prioritises the means and resources to overcome problems, challenges and obstacles in order to obtain the optimum outcome for all the parties involved. The individual needs to plan and deploy resources efficiently to realise the agreed results and be effective.

7. Conclusion

In this thesis has been carried out a **review of organizational program management maturity and best practices in a large business information system deployment**.

To perform this review, it has been firstly analysed the **project background**. The project is structured on the implementation of an ERP system on an Agricultural Company, which deals with the end-to-end process of Fruit production and global distribution.

It has been analysed the **Key Success Factor Methodology & Project Approach** that makes the project successful and being a driver factor for being chosen over competitors.

It has been developed an analysis about **OPM3 Best Practices' Knowledge Foundation** highlighting the gap between literature and real application. To assess the gap, a self-assessment tool has been tailored for this case. A questionnaire has been developed and successively filled by consultants currently employed by IT Company' project with Company Alfa.

Looking at the **Methodology & Project Approach currently applied** by the IT Company and the results recorded through self-assessment tool filled by consultants enrolled in projects of IT Company, it has been founded those standards contained within OPM3 Best Practices' Knowledge Foundation cannot be applied as they are listed within Knowledge Foundation, but they should be tailored following industry characteristics and project type. To fill this gap, **the IT Company has settled a best practice** creation **office** to develop and tailor best practices used internally the IT Company and as a service for other companies.

Further studies could be developed analysing the field of the project approach and more precisely the preparation of the project. This thesis has been developed on the execution of the project with a minor focus on the preparation phase.

8. Glossary

1. **Business Blueprint (BBP)** captures the capabilities that an organization wants to achieve at the end of the program. The project provides the "behind the scenes" details of the vision; and it does so by describing how to get from point A (AS IS Model) to point B (TO BE Model). The blueprint directs organizations towards long-term strategic investments, as opposed to business as usual and the annual budget that drives the short term and technology solutions.
2. Methodology extracted from **EVD™**. EVD™ is a property of Deloitte.
3. **P3M3 Maturity Model** https://wellingtone.co.uk/what-is-the-p3m3-maturity-model/
4. Broadbent and Laughlin, 2009. **Performance management systems A conceptual model**
5. **Introduzione al Capability Maturity Model** Ercole F. Colonese
6. **PMI OPM3** 2008 Second Edition
7. IPMA ICB® (International Project Management Association Individual Competence Baseline)

9. Annex

9.1 OPM3 Knowledge Self-Assessment - Questionnaire

This questionnaire aims to assess in accordance with the best practices provided by OPM3 Knowledge Foundation the level of Standardization, Measurement, Controlling and Improvement on selected topics that lie within the Project Domain.

OPM3 (Organizational Project Management Maturity Model) has been issued by PMI (Project Management Institute) which provides standards and guideline publications developed through a voluntary consensus standards development process.

A Best Practice is a grouping of related organizational capabilities.

Organizational Enablers are Best Practices which facilitate the implementation of Best Practices, but also helps organizational improvements in a sustainable way.

Could you please help me in understanding the Maturity Level about the following topics in your organization? This will be useful for the development of my thesis.

Thank you in advance for your kind collaboration.

Tommaso Scarrone

ABOUT YOU

1) Gender (Single choice)

• Male

• Female

• I prefer not to respond

2) What is your level of education? (Single choice)

• High School Diploma

• Bachelor's Degree

• Master's Degree

• PhD

• Others (Specify)

YOU AND YOUR KNOWLEDGE ABOUT OPM3

3) On a scale from 1 to 5, assess your knowledge level about OPM3 (Organizational Project Management Maturity Model) (1=Low .. 5=High)

4) Have you never worked with OMP3 tools (OPM3 Self Assessment Method or others)? Yes/no

5) Do you have a certification about OPM3? Yes/no

6) State the importance, from your point of view, of the following Best Practices regarding the development and the successfulness of a project:

(Please choose the degree of importance 1= not important… 5= very important)

	1	2	3	4	5
Project Collection of Requirements standards are established, with methods of measurement, controlling and improvements settled	•	•	•	•	•
Project Creation of WBS standards are established, with methods of measurement, controlling and improvements settled	•	•	•	•	•
Definition of the Activities standards are established, with methods of measurement, controlling and improvements settled	•	•	•	•	•
Project Estimation of Activity Duration standards are established, with methods of measurement, controlling and improvements settled	•	•	•	•	•
Project Management Plan standards are established, with methods of measurement, controlling and improvements settled	•	•	•	•	•
Execution of Project Quality Assurance Process standards are established, with methods of measurement, controlling and improvements settled	•	•	•	•	•

7) What is your current grade within the company? (Single choice)

• Analyst

• Consultant

• Senior Consultant

• Manager

• Senior Manager

• Director

BEST PRACTICES AND THEIR ACHIEVEMENTS

At question number 7 of the questionnaire, depending by the answer given, a **segregation** is applied on the questionnaire to be filled.

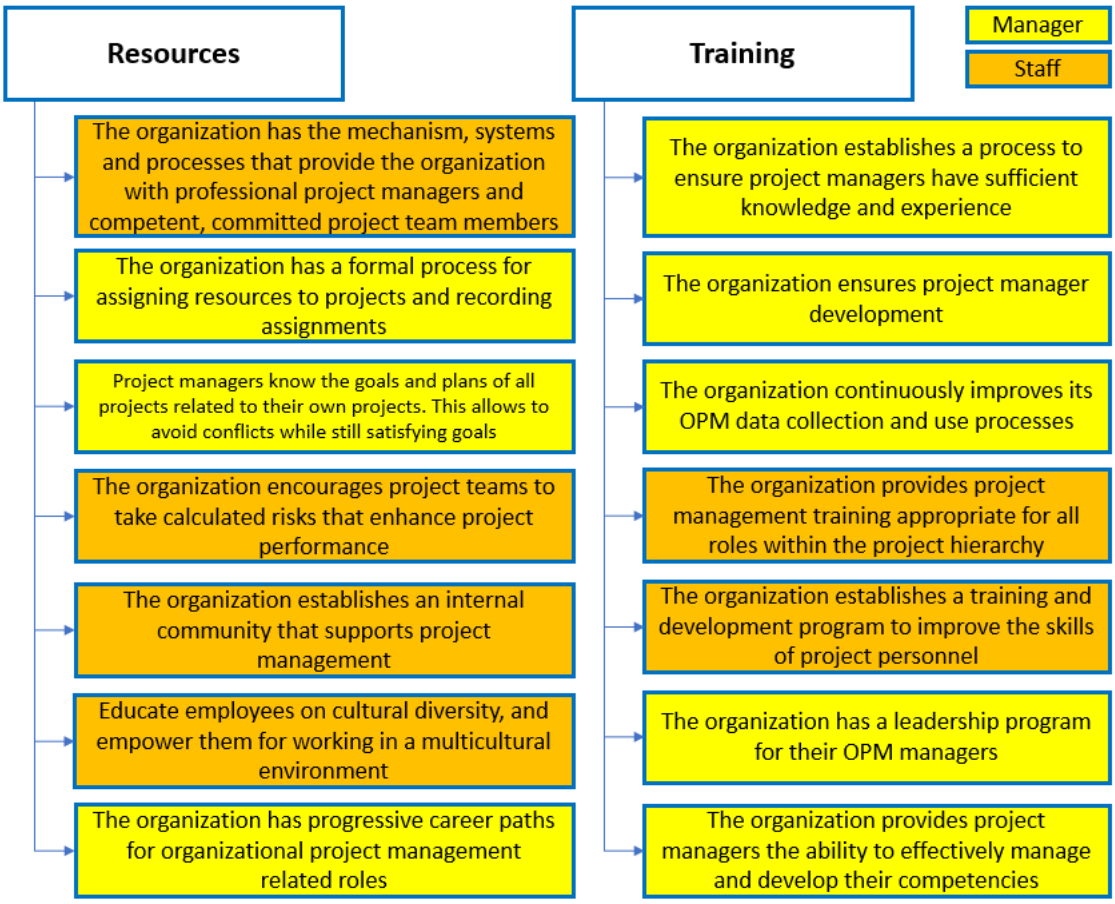
If the answer is Analyst, Consultant or Senior Consultant then the questionnaire is focused on topics of assessment related to the organizational structure (highlighted in orange).

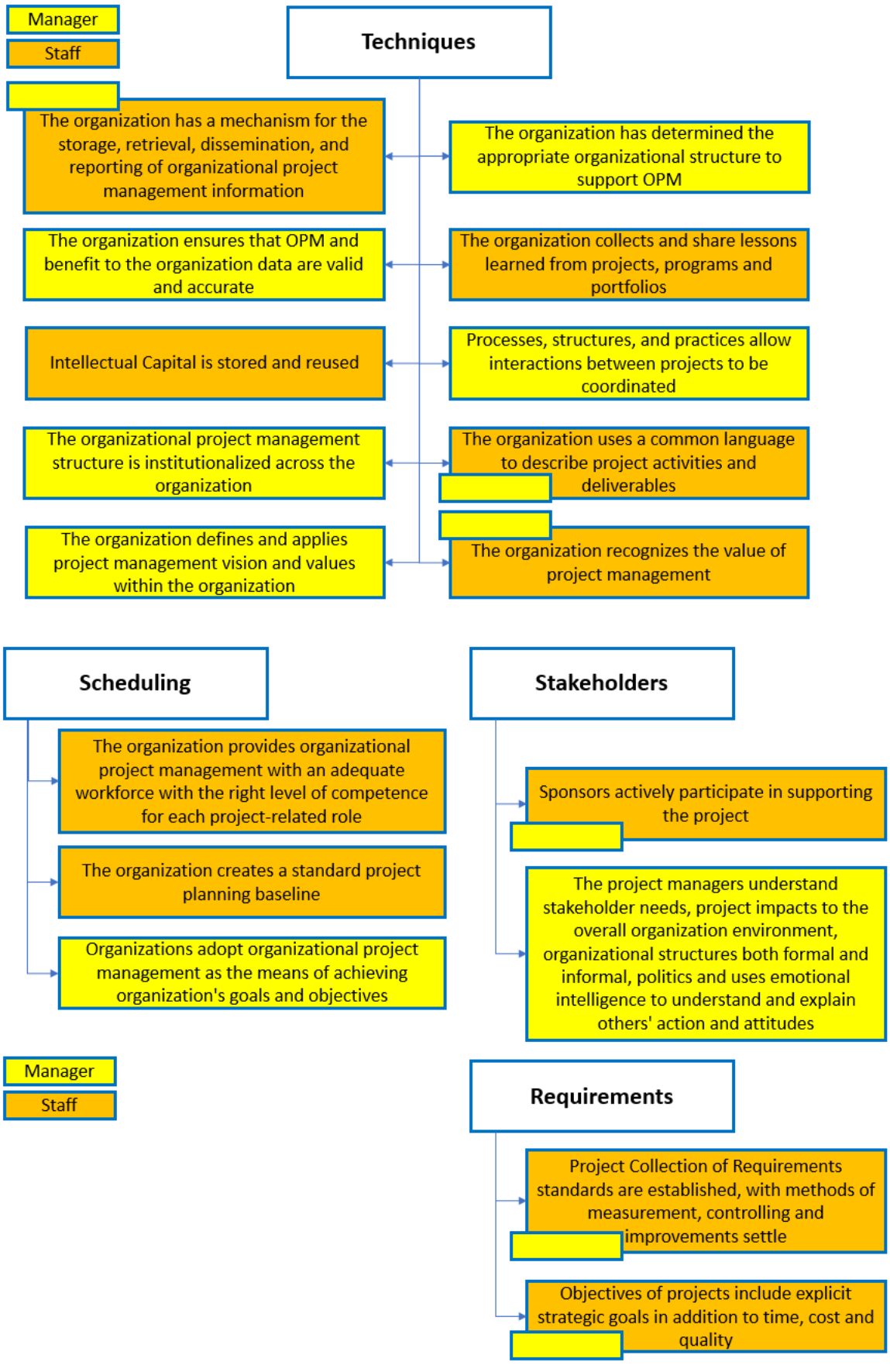
Otherwise, if it has been answered Manager, Senior Manager or Director then the questionnaire will be focused on management topics (highlighted in yellow).

Topics that are correlated to both the areas are highlighted with colours, yellow and orange.

8) State the degree of achievement, from your point of view, of the following Organizational Enablers regarding the development and the successfulness of a project:

(Please choose the degree of importance 1= low degree of achievement… 5= high degree of achievement)




Manager
Staff
Techniques
The organization has a mechanism for the storage, retrieval, dissemination, and reporting of organizational project management information
The organization has determined the appropriate organizational structure to support OPM
The organization ensures that OPM and benefit to the organization data are valid and accurate
The organization collects and share lessons learned from projects, programs and portfolios
Intellectual Capital is stored and reused
Processes, structures, and practices allow interactions between projects to be coordinated
The organizational project management structure is institutionalized across the organization
The organization uses a common language to describe project activities and deliverables
The organization defines and applies project management vision and values within the organization
The organization recognizes the value of project management
Scheduling
The organization provides organizational project management with an adequate workforce with the right level of competence for each project-related role
The organization creates a standard project planning baseline
Organizations adopt organizational project management as the means of achieving organization's goals and objectives
Stakeholders
Sponsors actively participate in supporting the project
The project managers understand stakeholder needs, project impacts to the overall organization environment, organizational structures both formal and informal, politics and uses emotional intelligence to understand and explain others' action and attitudes
Manager
Staff
Requirements
Project Collection of Requirements standards are established, with methods of measurement, controlling and improvements settle
Objectives of projects include explicit strategic goals in addition to time, cost and quality

9) State the importance, from your point of view, to have knowledge about Foundation of OPM3 Best Practices to improve your daily work

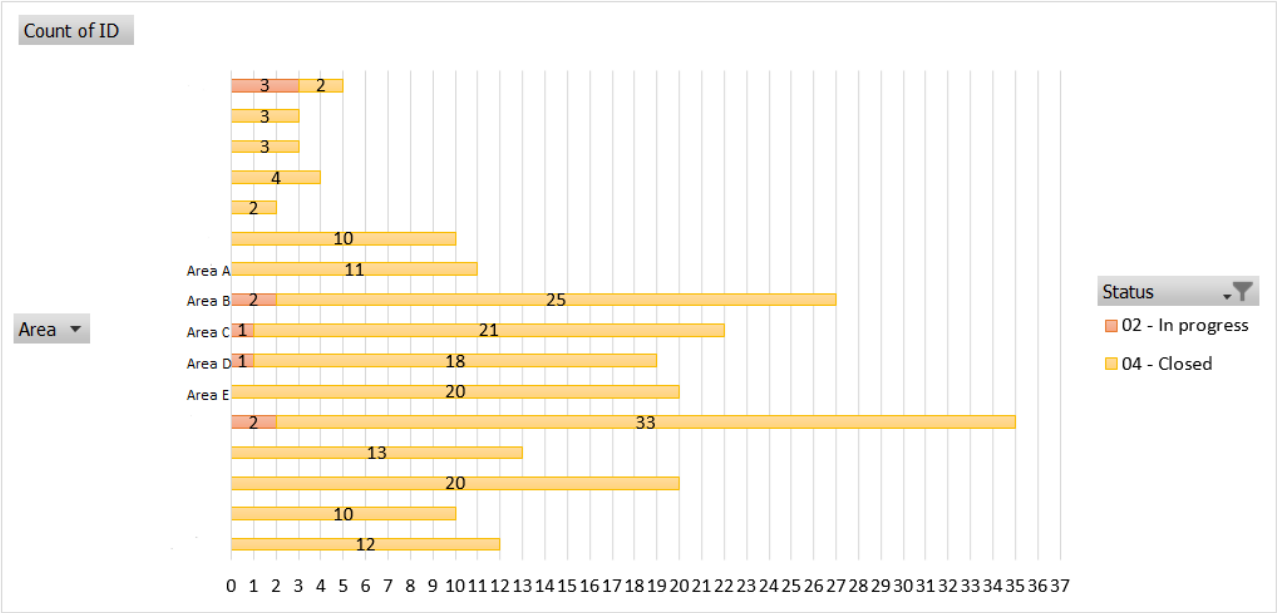
(Please choose the degree of importance 1= not important… 5= very important)

10) State the impact of the following actions in your daily work*:*

(Please choose the impact level 1= Low impact… 5= High impact)

	1	2	3	4	5
Standardization	•	•	•	•	•
Measurement	•	•	•	•	•
Control	•	•	•	•	•
Continuously improvement	•	•	•	•	•

9.2 Openpoint Pivot Tracking Table

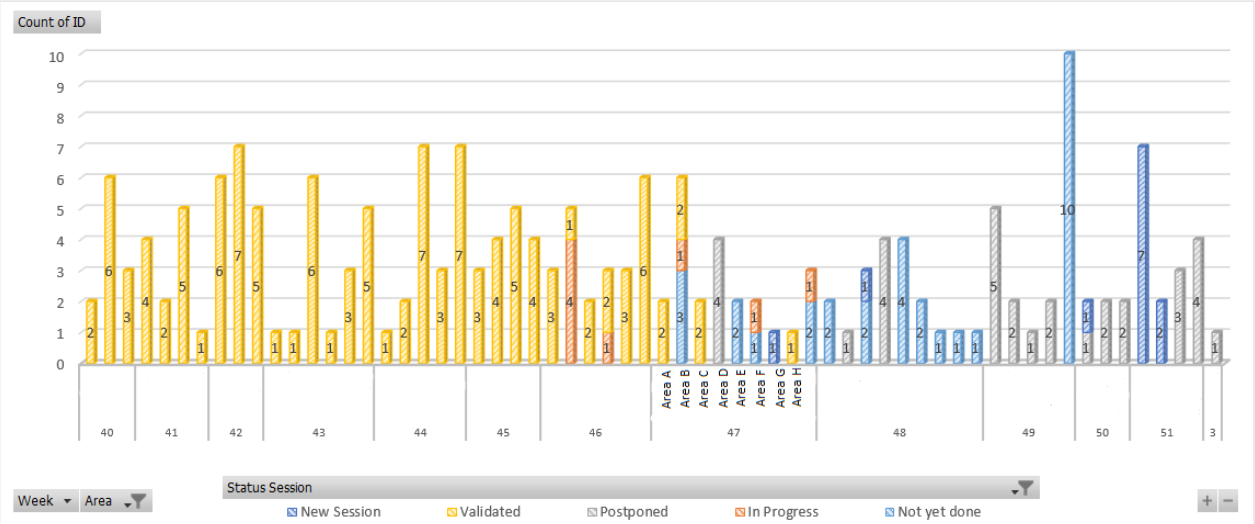


In this graph are shown Openpoints with the following status:

- 01 – Open
- 02 – In Progress
- 03 – Delay
- 04 – Closed

This tool is important for visualization purpose from Project Manager on the status of topics.

9.3 Activity Pivot Tracking Table



In this graph are shown sessions of User Acceptance Tests with the following status:

- New Session
- Validated Session
- Postponed Session
- In Progress Session
- Not yet Done

This tool is important for visualization purpose from Project Manager on the status of sessions.