

Handbook for Trainers

**Improve Efficiency of the
ESI Funds Absorption Processes in Slovenia
TSI ref. 23SI05 – ESIFunds-SI**

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Content

1.	Introduction	4
2.	How to use the Handbook.....	5
3.	Project Management	6
3.1.	Project Management skills.....	6
3.1.1.	Planning.....	6
3.1.2.	Communication.....	7
3.1.3.	Delivering results	7
3.1.4.	Monitoring risks	7
3.1.5.	Managing resources	8
3.2.	Project Management Life Cycle.....	8
3.2.1.	Phase 1: Initiation.....	8
3.2.2.	Phase 2: Planning	8
3.2.3.	Phase 3: Execution.....	8
3.2.4.	Phase 4: Monitoring	9
3.2.5.	Phase 5: Closing	9
3.3.	Investment Projects	9
3.4.	Investment Projects Management.....	10
3.5.	SMART Goals in Project Management.....	11
3.6.	Public Investment Management.....	12
3.7.	Public Investment Management and Public Financial Management	14
3.8.	Project Management Tools – in general.....	17
3.8.1.	Open Project	18
4.	Process Management	21
4.1.	Part of every project.....	21
4.2.	7M Analysis	21
4.2.1.	Man	21
4.2.2.	Machine	22
4.2.3.	Material.....	22
4.2.4.	Method	22
4.2.5.	(M)Environment.....	22
4.2.6.	Management	22

TSI ref.23SI05

4.2.7. Measurability	22
5. Change Management.....	23
5.1. What is change management?	23
5.2. Why is it important to take people into account?.....	23
6. Risk Management.....	25
6.1. What is Risk?.....	25
6.2. Risk Assessment	25
6.3. Risk Management Cycle.....	25
6.4. Risk Matrix	26
7. Public Procurement	28
7.1. Public Procurement in general.....	28
7.2. Public Procurement Fraud in general.....	29
7.3. Prevention of irregularities and inefficiencies in public procurement.....	29
7.4. Red Flags	32
7.5. Most common errors	32
7.6. ARACHNE.....	33
7.7. Public Procurement Cycle.....	34
7.8. Public Procurement Fraud - Examples	35
8. Cost Benefit Analysis (CBA).....	37
8.1. CBA – Definition and purpose.....	37
8.2. CBA - Steps	38
8.3. CBA - Costs and benefits that are difficult to value.....	46
8.4. CBA - Cost-effectiveness analysis	48

1. Introduction

This manual is intended as a support and reference work for future trainers within the project "Improve Efficiency of the ESI Funds Absorption Processes in Slovenia.

It provides additional information and highlights the background to the three presentations:

- Project Management (especially Management of Public Investment Projects, including Process-, Change- and Risk Management)
- Red Flags in Public Procurement
- Cost Benefit Analysis (CBA)

2. How to use the Handbook

The manual should be used by future trainers and lecturers to prepare lectures, training courses, etc. in order to be able to provide further explanations about the information shown on the respective slides.

It has a modular structure and can therefore also serve as an important basis for individual parts of the presentations.

3. Project Management

3.1. Project Management skills

Project management is a growing profession and changing fast. It has never been so important for project professionals to demonstrate their skills and for organisations to assess their capability. Project management skills are transferable. The tools and techniques of project management are universal and a good project manager should be able to add value in any environment.

A project manager needs many competencies; she/he

- should be effective at planning (*Planning*);
- possess excellent communication skills (*Communication*);
- should be able to deliver results (*Delivering results*);
- should be able to monitor risks (*Monitoring risks*);
- should be able to manage resources (*Managing resources*).

3.1.1. Planning

Project planning involves developing a roadmap that shows what successful project execution looks like in terms of scope, timeline, and budget.

A project charter or plan contains all the vital elements your project relies on to complete successfully and on time while maintaining high quality. A project plan often consists of seven aspects, including:

- A communication plan
- Schedule and timelines
- Project dependencies, deliverables, and milestones
- Budget and scope
- Team members' and stakeholders' roles
- Project management metrics to measure success
- Objectives and goals

Managers need skills to create elaborate plans, including determining dependencies, identifying tasks, and outlining project objectives.

3.1.2. Communication

Communication is a vital skill for project managers, encompassing verbal, written, and non-verbal forms to guarantee clarity among stakeholders. It involves continuously sharing the project or product vision and technical specifics within the team to guide work flow and task understanding. Additionally, project managers need to effectively present their ideas to upper management for project approvals and employ communication strategies for resolving conflicts within the team.

3.1.3. Delivering results

The focus a project receives is critical component in the success of its delivery. The fact that it needs focus indicates it should be defined as a project, which is vital to getting support and securing resources required.

One of the reasons projects fail results from not defining an activity as a project and not having a focus of delivery. This can mean the difference between something needing to be done and something actually getting done.

When activities are outside the normal spectrum of responsibility, they likely will be overlooked or pushed to the back of the queue. The risk that they will not get done increases and the likelihood for success is minimised.

3.1.4. Monitoring risks

Risk refers to anything that can have a negative effect on a project's schedule, cost, quality, scope, or objectives. It could be anything from external factors like power outages and competition to internal things like illnesses and scope creep.

Project managers are responsible for identifying possible risks, assessing their severity, and determining the chances of reoccurrence. This information is useful when developing a risk mitigation plan involving looking for solutions for your identified risks.

When implemented correctly, risk mitigation can empower with a proactive approach to ensure, attain and exceed the project goals. If not, project teams will have a reactive approach that involves dealing with an issue once it occurs without a definite strategy.

3.1.5. Managing resources

Resource Management skills enable to manage, source, and plan a project's financial, human, and other resources. These product manager skills make it easy to:

- maximize resources to enhance effectiveness and efficiency;
- manage resource utilization and availability;
- determine and allocate resources;
- create a management plan for project resources.

3.2. Project Management Life Cycle

According to the PMBOK Guide (Project Management Body of Knowledge) by the Project Management Institute (PMI), a project management life cycle consists of 5 distinct phases including initiation, planning, execution, monitoring, and closure that combine to turn a project idea into a working product.

3.2.1. Phase 1: Initiation

The project initiation phase is the first stage of turning an abstract idea into a meaningful goal. In this stage, it is necessary to develop a business case and define the project on a broad level. In order to do that, you have to determine the need for the project and create a project charter.

3.2.2. Phase 2: Planning

The project planning stage requires complete diligence as it lays out the project's roadmap. Unless you are using a modern project management methodology like agile project management, the second phase of project management is expected to take almost half of the entire project's timespan.

3.2.3. Phase 3: Execution

The project execution stage is where a team does the actual work. As a project manager, your job is to establish efficient workflows and carefully monitor the progress of your team.

Another responsibility of the project manager during this phase is to consistently maintain effective collaboration between project stakeholders. This ensures that everyone stays on the same page and the project runs smoothly without any issues.

3.2.4. Phase 4: Monitoring

In the project management process, the third and fourth phases are not sequential in nature. The project monitoring and controlling phase run simultaneously with project execution, thereby ensuring that objectives and project deliverables are met.

3.2.5. Phase 5: Closing

The project closure stage indicates the end of the project after the final delivery. There are times when external talent is hired specifically for the project on contract. Terminating these contracts and completing the necessary paperwork is also the responsibility of the project manager.

3.3. Investment Projects

An investment project is a detailed proposal of an expenditure of liquid resources, with the objective of taking actions that will lead to future profits.

- An investment project is made before the investment itself.
- An investment implies an expenditure of resources, but it doesn't necessarily mean that those resources are our own resources: a lot of investments are carried out by borrowing money.
- There is a temporal difference between the expenditure and the procurement of the profits. The procurement of the profits is farther away in time. This is an important fact that must be taken into account during the capital budgeting.
- The investment will try to achieve a change in future reality, like satisfying certain needs of people.
- An investment project requires careful planning and includes detailed descriptions of expenditures and incomes (sources and expected amounts).

Examples of investment projects:

- Building of a bridge that will allow people traveling from one sector of a city to another, to save traveling time.
- Building of an apartment building that gives housing to 10 families.

3.4. Investment Projects Management

Investment projects are managed at several levels, from the state level to individual companies.

In general, the management of investment activity in the real economy includes the distribution of financial and other resources across sectors and enterprises in accordance with the current needs of the economy and the impact of these investments on business, government and society. Government agencies are also seeking to raise funds from both domestic private investors and foreign investors.

Creating a favourable investment climate is one of the key objectives of investment management. Such activities are carried out by state bodies at the legislative level, including through tax incentives, solving problems of double taxation, clear rules for the export of capital outside the country and other measures.

If we talk about companies, the management of investment projects in the real economy can be considered both from the perspective of an investor and from the perspective of potential consumers. For an investor, the process of investment management consists in choosing the most suitable investment object, assessing the state of this object, determining the possibility of implementing the project, calculating the expected profitability of the investment project and assessing the risks of its failure.

For potential recipients of investments, project management consists in developing documentation, attracting resources on favourable terms, assessing the real possibilities of the investor, as well as developing the most appropriate action plan to achieve investment goals (financing, engineering, operation, etc.).

General principles for the proper management of investment projects include the following:

- A clear setting of goals and an action plan to achieve them in the shortest possible time with minimal use of investment resources.
- A single, clearly justified management system that will operate throughout the entire life cycle of an investment project.
- Maintaining compliance of the applied tools for managing investment processes with the development strategy of the investment object.
- Continuous professional monitoring of management decisions and control of their results at all stages of the investment project.

- Active involvement of independent experts to evaluate management decisions taking into account social, environmental and other factors.

3.5. SMART Goals in Project Management

In project management, SMART goals are specific, measurable, achievable, relevant, and time-bound objectives that guide project planning and execution. They ensure that teams are aligned and working toward achieving specific project outcomes within a set timeframe.

- Specific: The specifications are clear and exact.
- Measurable: The outcome can be quantified or measured.
- Achievable: The goal is realistic to achieve.
- Relevant: The goal relates to the goals of a particular project or the larger goals within an organization.
- Time-Bound: The goal includes a deadline or date by which success or failure will be determined.



Example - Mitigate Risks (related to Risk Management at the end of presentation):

Goal is to use a risk management plan and perform regular risk assessments during each project phase to anticipate and mitigate risks.

- Specific: The goal is to use risk assessments and a risk management plan to respond proactively to project risks.

- **Measurable:** The goal is measurable because the team can track the number of risks identified, the severity of each risk, and the effectiveness of the risk mitigation strategies implemented.
- **Achievable:** The goal is achievable because risk assessments and risk management plans are proven to help address risks early.
- **Relevant:** This goal is relevant because mitigating risks saves time and money for the organization in the long term.
- **Time-Bound:** The risk management plan must be completed at the beginning of each project, and risk assessments should occur at each new project phase.

Example – Investment Project

The goal for a “medium sized” city is to create the conditions for establishing of a center/place for AI technologies in order to attract start-ups and enable innovation.

- **Specific:** The goal is to find locations/buildings/space for attracting for companies who are developing AI technologies.
- **Measurable:** The goal is measurable because the space and the number of companies who start their business in the new AI Center can be defined (e.g. 15 Start up’s; 8000 m² for offices).
- Furthermore, it can be specified that, for example, at least 5 start-ups have been established within one year.
- **Achievable:** The goal is achievable because the global development of AI enables new business models for Start up’s.
- **Relevant:** This goal is relevant because such an AI Center helps the investing city to create new jobs (not only for AI) in the city with all following aspects (e.g. high qualified people will move to this city; they will spend their money in the city).
- **Time-Bound:** A time frame can be set for the creation of the prerequisites (e.g. creation of infrastructure, necessary permits). Furthermore, it can be specified that, for example, at least 5 start-ups have been established within one year.

3.6. Public Investment Management

Public investment management (PIM) is a crucial component of infrastructure investment and economic development. Improvements to PIM are expected to enhance the efficiency and effectiveness of infrastructure investment as well as its contribution to achieving development goals. Analysis has

shown that the quality of public governance correlates with public investment and growth outcomes; improving governance arrangements, across levels of government at national and subnational levels, throughout the life cycle of an investment project could therefore achieve significant benefits.

PIM concerns the management of public investment projects; each part of the term “public investment project” needs to be defined carefully to establish the boundaries of the PIM system.

Public investment management (PIM) needs to be situated in an appropriate legal and regulatory framework to ensure its proper functioning and to apply common standards and methods in a consistent manner.

SOEs and subnational government investment:

A reasonably tight definition of “investment” can be formulated, but there is considerable variation when defining the scope of a management system for public investment projects. A key issue is the extent to which investments by state-owned enterprises (SOEs) and subnational governments (SNGs) fall within the scope of the national PIM system.

When defining the scope of PIM, countries should consider two principles:

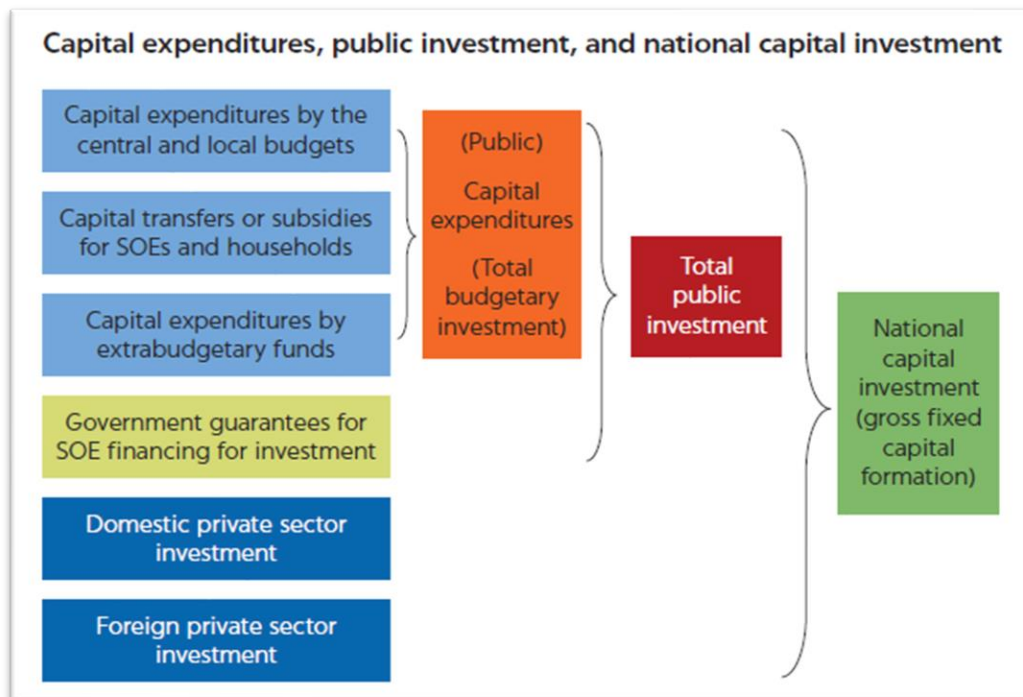
- PIM is a subsystem of public financial management; as such, public investment should have direct implications, actual or potential, for the public finances at some point in time.
- “Public” may be interpreted as indicating a public policy purpose—that is, through the delivery of public services or other welfare-improving effects.

The below chart looks at the issue from a statistical, or national income accounting, perspective; it distinguishes between public capital expenditures, public investment, and national capital investment. Public investment, as defined in the chart is investment undertaken by the public sector, and thus extends to investment by SOEs. When the PIM system is defined in line with the first principle above, it would be confined to that part of SOE investment with potential implications for public finance – that is, it would be funded by capital transfers or subject to government guarantees.

The Chart shows the full-scope model – a PIM system covering all national public sector investment with a potential impact on public finances. In practice, most PIM systems will be narrower in scope, depending on such factors as the constitutional position of subnational government and the framework for SOE governance. A narrower scope for the central PIM system is especially common in

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federal states, but it also applies to constitutional arrangements where local governments have significant autonomy. Even where subnational government investment is not covered, the system usually would include SNG projects receiving earmarked capital transfers from the central government budget. Where constitutional arrangements prevent the national system from applying to lower levels of government, SNG s should replicate the national system at their level.



3.7. Public Investment Management and Public Financial Management

Public investment is a component of public expenditures, and public investment management is a branch of the wider public financial management system. Therefore, the hierarchy of objectives for public financial management corresponds to those for PIM, as shown in table below:

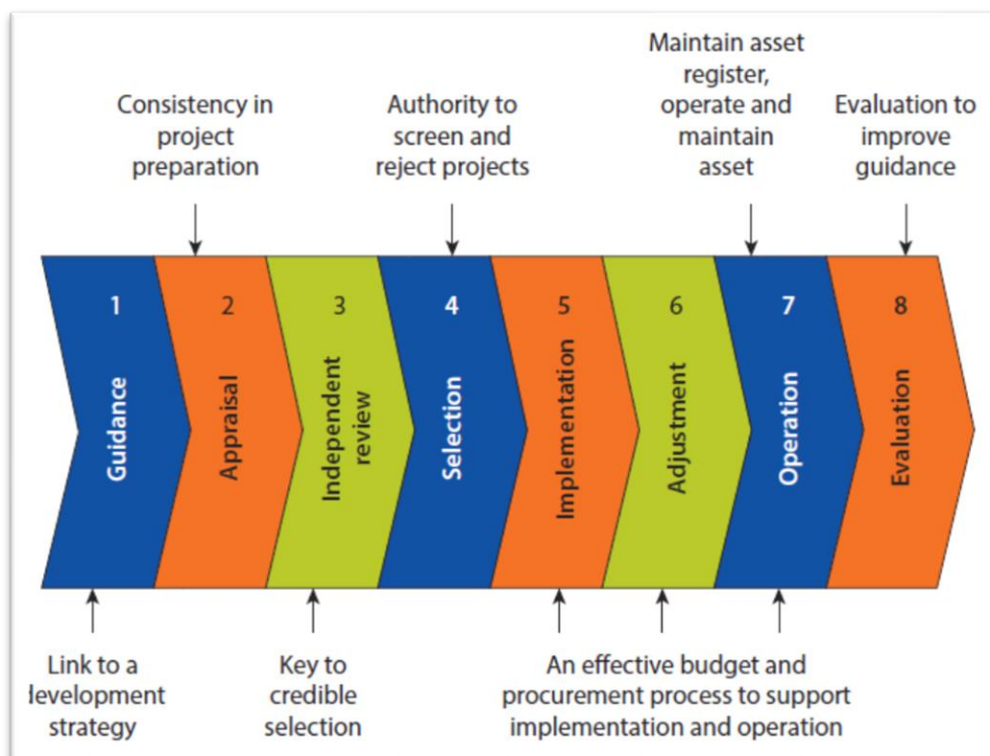
LEVEL	OBJECTIVES OF PUBLIC FINANCIAL MANAGEMENT	IMPLICATIONS FOR PUBLIC INVESTMENT MANAGEMENT
Level I: aggregate fiscal discipline	Exercising effective control of the total budget and management of fiscal risks	Aggregate public investment spending planned within realistic resource ceilings and individual projects completed within budget
Level II: strategic allocation of resources	Planning and executing the budget in line with government priorities aimed at achieving policy objectives	Capital investment projects selected and budgeted in accordance with government's strategic priorities to address the most pressing problems or constraints
Level III: efficient service delivery	Using budgeted resources to achieve the best levels of public services within available resources	Capital investment projects evaluated to verify that they represent efficient and effective solutions to identified problems; that they are procured economically, implemented efficiently, and operated as planned

Public financial management objectives and implications for PIM

Signs of weak PIM are often apparent to citizens and other stakeholders, mostly in terms of poor public services, but also the low importance given to achieving value for money – that is, vanity projects going ahead when basic services remain unmet or new projects starting while others are visibly stalled.

Main features of an effective public investment management system:

A World Bank publication identifies eight key features for an effective PIM system, as illustrated in the following figure. The “must-have” functions associated with these key features can be found in good-practice countries; their division into eight categories is for the purpose of conceptualizing the framework.



In simplified terms, eight must-have functions are key:

1. Strategic investment **guidance**, project concept development, and pre-appraisal screening. Broad strategic guidance to guide sector-level decision makers and preliminary screening to ensure that project concepts meet minimum criteria of consistency with the government's strategic objectives and with the economic classification.
2. A formal project **appraisal** process. A regulated set of project preparation steps: prefeasibility and feasibility studies, including preliminary design; environmental and social impact assessments that must be completed before a project can be approved for funding; and methods appropriate to the technical capacities and scale and scope of the project.
3. **Independent review** of appraisal. Review by the finance ministry, a planning ministry, or an independent agency to counter optimism bias—overestimation of demand and underestimation of costs.
4. Final decision on project **selection** and budgeting using a well-managed budget process. Linking appraisal and selection of public investment projects to the budget cycle, even if the project evaluation cycle is on a different timetable; verification of project eligibility and priority; close scrutiny of forward costs and funding during budgeting.

5. Efficient project **implementation**. Scrutiny for implementation realism, including organizational arrangements, procurement planning, and a timetable; adequate monitoring systems; and systems for managing total project costs.
6. Ability to make project **adjustments**. Flexibility to allow changes in the disbursement profile—including discontinuation of nonperforming projects—to take account of changes in project circumstances
7. Provision for sustainable **operation** of facilities. Processes to ensure that a new facility is ready for operation and that the intended services can be delivered on a sustainable basis; requires effective handover of management responsibility for operation and maintenance and upkeep of robust and up-to-date capital asset registers
8. Basic completion review and ex post **evaluation**. A systematic review of all projects upon completion to assess whether a project was delivered as specified, on time, and according to budget, and to introduce a more sophisticated ex post evaluation to assess the project's outputs and outcomes against objectives established in the design.

3.8. Project Management Tools – in general

A Project Management Tool will

- Increase efficiency - Simplify complicated workflows and automate repetitive tasks.
- Enhance project organization - Organization is the backbone, PM tools help to stay organized.
- Work centralization - Information consolidated in one place and accessible to authorized stakeholders.
- Faster and improved collaboration - Features like file sharing, chat, and other forms of communication between teams, huge advantage among remote teams.
- Improve resource management - PM tools are project managers' eyes and ears (e. g. track team workloads, identify resource requirements, address bottlenecks).
- Proactive risk mitigation - Bird's eye view of the project and its underlying activities.
- Data-driven insights - Track project performance, health, and status, critical metrics, and benchmark performance.
- Transparency and accountability - Create a sense of ownership, updates and performance data.
- Resilience and adaptability - PM tools scale with your needs.

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There are hundreds of different Project Management Tool solutions available, starting from simple and for free programs like SharePoint, OneDrive storage or E-Office tools.

Preconditions are unified templates and the appointment of one responsible person who operates the system, especially structure of storage, and keeps it up to date.

Other Project Management Tools have to be paid for and have their Pros and Cons.

3.8.1. Open Project

Experts prefer and recommend “**Open Project**”, specialized on the public sector and used by several cities and communities.

“**Open Project**” provides e. g.:

Work Packages - With the work packages you can easily create, assign and manage your work. Responsibilities and timings are visible to all project members. Filtering e.g. by open tasks, your own tasks or priorities makes your work easier.

Charts - Plan and manage your projects and tasks collaboratively with the team. Keep track of important deadlines, manage dependencies and see what needs to be done next.

Budget planning - Keep an overview of project budgets and spent costs. Plan the costs for each project phase and see at a glance how much of the assigned budget has been spent.

Boards - In agile boards you can easily control and track workflows. Implement processes and enable simple and intuitive tracking.

Content Management - Manage project documentation, references, policies, user manuals, and more in one central location and create a knowledge base for your projects and share it with your team and other stakeholders.

Meetings - Send invites directly for meetings or calls. Agenda and minutes can be shared and edited by everyone. This way all information of the project is recorded.

Project Portfolio Management - including overview of entire project portfolio, several projects, project structure with hierarchies, status, project list or project dashboard. It is possible to get an

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overview of all projects in the project lists, to filter project lists and adjust filters, mark projects as favourite or share project lists with individual users and groups.

Project Planning – including features to define project objectives and break it down into smaller deliverables, analyse required activities and create a detailed plan that shows how and when the project will provide the deliverables defined in the project scope as well as plan team member's priorities and workload in the team planner. It is possible to create a project management plan that visualizes how and when the work packages and milestones will be delivered and to generate a timeline collaboratively with the team. Work packages are items in the Gantt chart (e. g. phases, milestones, tasks, features, etc.) with specific attributes, assigned to team members. In addition, relations on functional or timely levels as well as hierarchies can be assigned. Project overview is a single dashboard page where all important information of a selected project can be displayed. The idea is to provide a central repository of information for the whole project team.

Task Management – Open Project provides an easy way for teams to track their work and achieve results, organize and prioritize own tasks and assign tasks to team members and have all tasks and communication in one place. Everyone is up to date about the progress and next steps. The dynamic task list provides an overview of all the work that has to be completed. Individual lists with filters help to organize the tasks.

Budgeting – The PM-tool makes time tracking easy to stay on top of project budgets and time and costs spent. It is possible to create custom reports for accurate, current insight into project performance and allocated resources as well as plan the cost for each project phase, and see how much of the allocated budget has been spent at a glance. The budget feature enables to plan labour as well as unit costs and keep an eye on the status, multiple filter options create customized cost reports and evaluations on spent time and costs.

Product Roadmap – Open Project provides an easy way to plan, visualize and communicate the product roadmap. It is possible to share product roadmap with stakeholders, get feedback about ideas and break it down into a detailed release plan as well as to align product roadmaps with strategy and create transparency across all teams. A direct overview of the progress of a version or multiple projects can be developed and project features can display tasks and milestones in a timeline to schedule and plan project completion.

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Workflows – Open Project can be adapted to organization's needs. Different forms - from work package forms, workflows, custom fields and theme and many more can be explored to reduce manual work and standardize to avoid errors and make teams faster. It is possible to define the workflow of statuses that a work package is going through until being finished and closed, work package forms can be configured, groups can be created and managed as well as work packages can be assigned to them.

4. Process Management

4.1. Part of every project

Process management is a systematic approach to ensuring effective and efficient business processes. It is a methodology used to align business processes with strategic goals.

Process management focuses on optimizing recurring processes that organizations carry out regularly. It examines each business process individually and as part of the more extensive system to enhance overall efficiency. By analyzing workflows, it identifies bottlenecks and uncovers opportunities for improvement. Unlike project management, which targets the completion of specific, time-bound projects, process management ensures that ongoing activities run smoothly and continuously deliver value.

Process management is a long-term strategy of constantly monitoring business processes to ensure optimal efficiency. Implemented correctly, it significantly helps boost business growth.

4.2. 7M Analysis

As a discipline, management consists of the interlocking functions of formulating corporate policy and organizing, planning, controlling and directing an organization's resources to achieve the policy's objectives.

The functions of management involve planning, controlling, leading, organising decision making of business areas in Marketing, Production, Sales, Research & Development, Human Resource, Finance and Operations.

There are various levels of management. Top level takes a major and crucial decisions and frames organization mission, vision and objectives. Middle level management of how to implement those business objectives. Policies are framed and work method are determined.

4.2.1. Man

Man in management is referred to as a human resource. It is the recruitment, selection training, promoting and grievances handling of personnel. Payment of compensation gratuity, termination of services are the few issues that have to be dealt effectively to retain the talent within an organization.

4.2.2. Machine

Machine is the basic tools to produce good or to generate services. The selection of an appropriate machine not only enhances efficiency but also saves times and increases revenue.

Tailoring the requirement of the organization, Selections of right technical machine and equipment, availability of spare parts, evaluation of after sales services, substitutes and technology and the organization budget are the crucial criteria while purchasing a machine.

4.2.3. Material

Material is a basic ingredient in management be it a service industry or a product industry. Most of the industries locate them self, nearby to the availability of material.

4.2.4. Method

Everything has a right way to do and this right way is known as a Method in management. In short it means, an art of doing. As set of procedures and instructions is known as a method. The visible methods of a company include: Plans, Policies, Procedures and Data.

4.2.5. (M)Environment

Many predictable environmental factors can be considered and managed. There are rare, unavoidable causes of non-compliance beyond the influence of a production enterprise; e.g. tidal or seismic events.

4.2.6. Management

Management is how businesses organize and direct workflow, operations, and employees to meet company goals. The primary goal of management is to create an environment that lets employees work efficiently and productively.

4.2.7. Measurability

Measurements are quantified observations of some aspects or attribute of a process, product or project. Measurements enhance our ability to understand things not accessible to our native abilities and intelligence.

5. Change Management

5.1. What is change management?

Change management (sometimes abbreviated as CM) is a collective term for all approaches to prepare and support individuals, teams, and organizations in making organizational change. It includes methods that redirect or redefine the use of resources, business process, budget allocations, or other modes of operation that significantly change a company or organization. Organizational change management considers the full organization and what needs to change, while change management may be used solely to refer to how people and teams are affected by such organizational transition. It deals with many different disciplines, from behavioural and social sciences to information technology and business solutions.

Change Management incorporates the organizational tools that can be utilized to help individuals make successful personal transitions resulting in the adoption and realization of change by supporting people, managing resistance to change and development of abilities and knowledge needed for change implementation. Change management is the process, tools and techniques to manage the people side of change to achieve the required business outcome.

5.2. Why is it important to take people into account?

Organizational change is a fact of life; it involves changes of organizations' mission, vision and/or processes, with impact at both individual and organization level. Some organizations accept changes if they consider them as necessary and quickly adapt their behaviour in a desired new direction but in most cases changes are considered unnecessary or very difficult and organizations do not adapt to the new context defined by the turbulent environment in which they operate.

Challenges affect agencies and organizations of all shapes and sizes – and the government is no exception. Top-of-mind concerns at governmental agencies include the familiar challenges faced in the private sector – such as employee engagement, training, recruiting, and retention – as well as challenges unique to the public sector, such as changes to the agency's mission or presidential transitions. Governmental agencies can address these challenges through various organizational change management strategies.

TSI ref.23SI05

The objective of a change management programme is to ensure that standardised methods and procedures are used for efficient handling of all major changes. A carefully planned change management programme is the first successful milestone of projects.

6. Risk Management

6.1. What is Risk?

Risk is the lack of certainty about the outcome of making a particular choice. Statistically, the level of downside risk can be calculated as the product of the probability that harm occurs (e.g., that an accident happens) multiplied by the severity of that harm (e.g. the average amount of harm or more conservatively the maximum credible amount of harm).

6.2. Risk Assessment

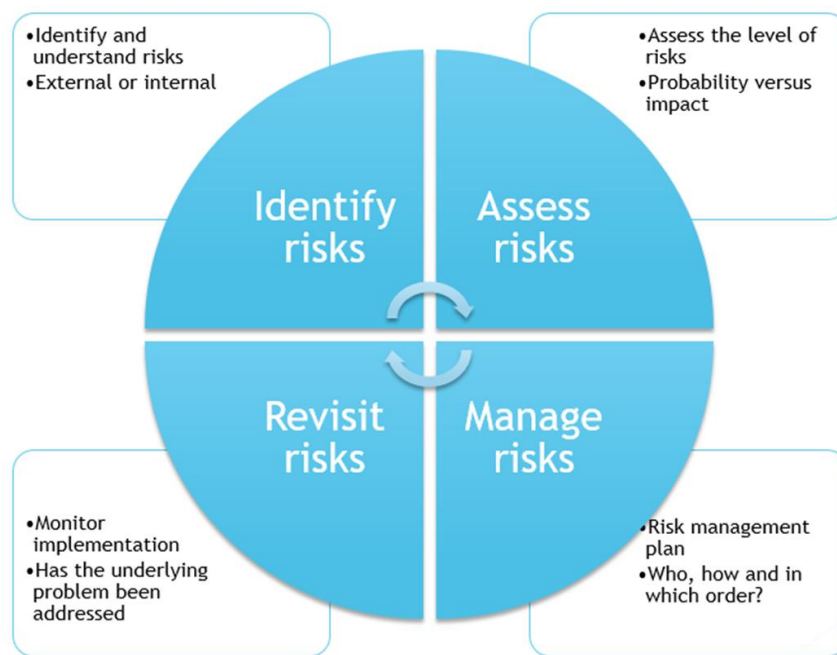
Risk assessment is a process used to identify potential hazards and analyze what could happen if a disaster or hazard occurs. There are numerous hazards to consider, and each hazard could have many possible scenarios happening within or because of it.

6.3. Risk Management Cycle

The Risk Management Cycle is a clearly defined method of understanding what risks and opportunities are present, how they could affect a project or organization, and how to respond to them. Formalizing this process within organizations along with communicating the tools and methods used will strengthen the Project Risk Management overall, paving the way for much greater project success.

The 4 essential steps of the Risk Management Cycle are:

- Identify the risk.
- Assess the risk.
- Manage the risk.
- Revisit the risk.



6.4. Risk Matrix

A risk matrix visualizes risks in a diagram. In the diagram, the risks are divided depending on their likelihood and their effects or the extent of damage, so that the worst case scenario can be determined at a glance.

In this sense, the risk matrix should be seen as a result of the risk analysis and risk evaluation and is therefore an important component of your project and risk management.

The risk matrix

- identifies the gravest project risks.
- creates and presents the risk situation with minimal effort.
- presents the risk situation visually and comprehensively.
- presents the risk situation simply for everyone because no prior knowledge is required to understand it.
- assesses the efficiency of your risk measures.

5x5 Risk Matrix Example

Impact
How severe would the outcomes be if the risk occurred?

→

Probability
What is the probability the risk will happen?

↑

	Insignificant 1	Minor 2	Significant 3	Major 4	Severe 5
5 Almost Certain	Medium 5	High 10	Very high 15	Extreme 20	Extreme 25
4 Likely	Medium 4	Medium 8	High 12	Very high 16	Extreme 20
3 Moderate	Low 3	Medium 6	Medium 9	High 12	Very high 15
2 Unlikely	Very low 2	Low 4	Medium 6	Medium 8	High 10
1 Rare	Very low 1	Very low 2	Low 3	Medium 4	Medium 5

7. Public Procurement

7.1. Public Procurement in general

Public Procurement (PP) refers to the process by which public authorities, such as government departments or local authorities, purchase work, goods, or services from companies.

Public procurement is about public authorities buying goods, works (such as construction) or services from private companies. Examples of public procurement include buying computers for a police station, providing water, gas and electricity to people, and building a hospital or a road.

Three Phases of the PP-process:

- Deciding which goods or services are to be bought and when (procurement planning).
- Process of placing a contract to acquire those goods or services which involves, in particular, choosing who is to be the contracting partner and the terms on which the goods or services are to be provided.
- Process of administering the contract to ensure effective performance.

Three Categories for the diversity of procurement transactions:

- Goods (supplies or products): e.g. simple items such as office furniture or very complex items such as guided missiles.
- Works (construction): e.g. building of roads, bridges and government buildings.
- Services: this includes manual services such as maintenance of government buildings or cleaning of roads, as well as professional services such as those connected with construction (architectural and engineering services), legal services or consultancy services.

Objectives of PP-Systems:

- Value for money (efficiency) in the acquisition of required goods, works or services.
- Integrity – avoiding corruption and conflict of interest.
- Accountability.
- Equal opportunities and equal treatment for providers.
- Fair treatment of providers.
- Efficient implementation of industrial, social and environmental objectives ("horizontal policies") in procurement.
- Opening up public markets to international trade.
- Efficiency in the procurement process.

Key principles for implementing procurement objectives are Transparency, Competition and Equal treatment.

7.2. Public Procurement Fraud in general

The government is the single largest customer in developed countries, accounting for 10% to 20% of GDP (OECD). Citizens rely on government agents to procure a wide variety of goods and services from the private sector, ranging from routine supplies to large infrastructural projects, such as schools, hospitals, and airports. Citizens cannot perfectly observe how public officials make purchasing decisions on their behalf, giving rise to agency problems that potentially increase the cost of public procurement.

Vigorous competition among suppliers helps governments to obtain the best value for money for the goods and services they procure. Conversely, when competition is curtailed – for example when suppliers engage in bid rigging – taxpayers' money is wasted as governments pay more than a fair price.

Competition in public procurements is compromised when public officials choose to waive fair and equitable policies and processes and favour a particular bidder whether for pecuniary considerations or otherwise. Bid rigging occurs in all types of industries and circumstances, and in all parts of the world. When bid rigging impacts public procurement, it has the potential to cause great harm to taxpayers. One reason for this is that public procurement is often a large part of a nation's economy.

In order to ensure that contracts are awarded in a transparent manner and that competition is promoted, it is essential that data be published in a proper way, in other words - transparency in public procurement and electronic procurement are essential to ensure efficiency and accountability of public buying.

7.3. Prevention of irregularities and inefficiencies in public procurement

Following topics must be considered:

- **Institutional Framework** - As a first step it is worth devoting attention to the institutional framework for procurement, as institutional conditions determine to a great extent the quality

of a procurement process, especially if they are more complex than ordering printing paper. Often, what seems from the outside as corruption, is simple mismanagement arising from capacity issues, lack of knowledge, or simply poorly designed workflow processes.

- **Legal framework** - Assess whether the legal framework (such as procurement rules, codes of ethics, and conflict of interest regulations) of your institution applies to all the procurement processes that you undertake, whether it is in line with national and EU legislation, and whether it responds to institutional corruption risk assessments.
- **Administrative framework** - Assess whether your institution has the case management and documentation systems in place that are necessary to track the whole procurement process. Check also if data that needs to be linked during the process can be connected throughout your databases and regardless of formats.
- **Safeguard of transparency** - Assess if your institution is fit for transparency, meaning that it can easily release information stored in your internal documentation systems, and share it with the public, while ensuring the protection of personal data and any other information that should be protected (such as genuine business secrets). Procurement processes should be as traceable for the public as they are for those who administer them: Citizens should be able to connect the proposal of a purchase with the reasoning of a decision, assessment of needs and impact, the published procurement notice with the award justification and so on. All data should be published both on your, the buyers', webpage, and in central repositories of procurements and contracts if they exist.
- **Capacity/capability assessment** - Assess if your staff is capable of managing procurements, and evaluate in which areas they need training and development, or whether there are areas where the recruitment of personnel is needed. Decide if you can manage a procurement solely within your institution or if you need to involve external experts. In the latter case, make sure that the expert's contribution to the process becomes institutional knowledge. Make sure that all departments that work on a procurement have the same information available, and that their tasks and roles are clearly defined.
- **Assessment phase** - Good procurement takes time. Make sure that by assessing procurement needs in advance, you have time for preparation and are familiar with respective mar-

kets. It is common that purchasing bodies pretend to know what they need without a thorough needs assessment; many even think they know who would deliver it in the best possible way. Actually, you never know until you analyse the market, other procurers, and evaluate a wide range of bids, e. g. assessment of previous years' procurement, spending analysis, assessment of procurement practices of similar institutions, looking ahead, listen to citizens.

- **Preparatory phase** - Once a public body has been defined what is to be purchased, tactical details can be prepared. Depending on how far in advance the needs assessment was conducted and on how complex the procurement is, this preparatory period can range from less than a week to a couple of months. Based on the complexity and details of the process, following topics should be considered: project team, market analysis / suppliers, potential co-purchasing entities, stakeholder / expert involvement, citizen involvement, impact assessment, life-cycle assessment, risk assessment, involvement of external monitors, emergency procurement / quick procurements.
- **Tendering phase** - Tendering is the area which includes the biggest risks in the procurement process, as it is difficult and often very expensive to initiate any changes once an award has been made based on poorly conducted tender. Following steps are crucial: selection of procedure, safeguards of inclusion, specification of quantity, specification of object, eligibility criteria, contract duration, evaluation criteria, licences, copyright, source code, algorithms, subcontractors.
- **Awarding phase** - It is important to ensure full transparency of the award process and the integrity of the decision-making committee. You should also be prepared for non-winners challenging results. Following steps are important: decision making, examine tenders thoroughly, due diligence, unsuccessful procedures, publication of bids and results.
- **Contracting phase** - Some parts of your contract will be defined in advance when preparing the tender process, while other elements can only be included after the award when you have full information about the winning bidder. Following issues should be determined: model contracts, penalty payments, coherent project phases, financial instalments, responsible individuals, copyright, licence, ownership, maintenance, testing and warranty, liabilities of contractor, risk sharing, conditions of ending contracts, assessment of assets, its conditions, conflict resolution legal dispute.

- **Implementation/delivery phase** - The main task of the purchasing body in the implementation phase is monitoring and ensuring that goods, works and services are delivered according to the contract, e. g. monitoring by buyer, civic monitoring, testing and control of deliverable.
- **Evaluation phase** - Evaluation permits you to assess whether a procurement was done according to contract and whether it fulfilled the goals that were set when launching the project. It is, nevertheless, one of the poorest-implemented parts of procurement, which is regrettable as it can result in many lessons learned, which in turn can improve your procurement processes in the future, e.g. check against goals, KPIs, document outcomes, conduct surveys, interviews, plan for long-term evaluation, transparency, make the process publicly accessible with open and linked data, feedback to legislator, partners, and the public.

7.4. Red Flags

Red flags take a number of forms, such as:

- Behaviour that falls short of what the public would expect.
- Behaviour that is ethically or morally wrong.
- Mismanagement by error or mistake, negligence, or inadvertence.
- Intentional or wilful wrong-doing, and which may be considered criminal.

Corruption Red Flags in general are facts, events, or sets of circumstances, or other information that may indicate a potential legal compliance concern for illegal or unethical business conduct, particularly with regard to corrupt practices and non-compliance with anti-corruption laws.

One red flag doesn't mean a contract is corrupt or illegal, just a hint that a closer look may reveal irregularities.

7.5. Most common errors

- **Procedure** - e.g. absence of tendering or inappropriate procedure; cases not justifying the use of the negotiated procedure without prior publication of a contract notice; unlawful splitting of contracts; underestimated contract value.

- **Publication** - e.g. non-compliance with publication requirements; non-compliance with time limits and/or extended time limits for receipt of tenders or requests to participate; insufficient time for potential tenderers/candidates to obtain tender documentation; failure to publish the selection and/or award criteria in the contract notice or in the specifications.
- **Technical specifications and criteria** - e.g. insufficient definition of the subject matter of the contract; restrictive technical specifications breaching equal treatment, non-discrimination and transparency requirements; unlawful, disproportionate and/or discriminatory selection and/or award criteria; mixing-up of selection and award criteria.
- **Selection, evaluation, award** - e.g. lack of transparency and/or equal treatment during evaluation; changing of selection/award criteria after opening of tenders, resulting in incorrect acceptance of tenderers; changing a tender during evaluation; negotiation during the award procedure; arithmetic errors when adding up scores and ranking tenders; use of average pricing; insufficient rejection of abnormally low tenders; conflict of interest; inappropriate contract terms.
- **Contract implementation** - e.g. award of additional works/services/supplies contracts without competition when no exceptional circumstances have been demonstrated; change in the scope and/or value of the contract.

7.6. ARACHNE

Charter for the Introduction and Application of the ARACHNE Risk Scoring Tool in the Management Verifications - <https://ec.europa.eu/social/main.jsp?catId=325&intPageId=3587&langId=en>

The ARACHNE Risk Scoring Tool represents the most state-of-the-art technology in terms of data mining and data enrichment. Applying this advanced technology will:

- contribute to help improving the efficiency and effectiveness of management verifications, thus contributing to optimizing the human resource capacity for the desk review and on-the-spot verifications;
- offer the managing authority to document increased effectiveness and efficiency of the management verification over time;
- prevent potential irregularities and therefore result in lowering error rates, a common aim both of the Commission and the managing authorities;

- put in place an effective and proportionate anti-fraud measure, in line with Article 125 (4)(c) of the CPR.

7.7. Public Procurement Cycle

- **The Need** - In this case, the need usually goes through a business case and is then tightly defined and specified.
- **Financial Authority** - This usually happens at a higher level and includes the management of the department that requires the goods.
- **RFP** - A Request for Proposal (RFP) is written, in which the need is highly specified.
- **Invite Tenders** - This is always done formally, usually by posting the request in trade magazines and appropriate web sites. Government projects are posted on government web sites.
- **PQQ** - A Pre-Qualification Questionnaire (PQQ) is sent out to likely suppliers in order to select a short list of appropriate potential suppliers.
- **Tenders** - The tenders are sent in from the qualified suppliers.
- **Qualifying** - A number of meetings are held to clarify any questions that suppliers may have.
- **Evaluation** - This is the most exciting part of the purchasing cycle and can take many weeks for a big tender. All the tenders are evaluated and the requirement awarded to the winning bidder.
- **Negotiation** - The fine print of the terms and conditions are negotiated with the chosen supplier. The price is fixed at the bid price.
- **Contract Award** - In a very short time, the contract is awarded to the chosen bidder.
- **Manage Contract** - This is the period in the purchasing cycle when the goods or services are delivered.

- **Approval And Payment** - If the contract is carried out completely then full payment is made. If there are problems, there may be a damage request.
- **Sign Off** - At the end of the contract work and deliveries, the contract is signed off and all relationships with the supplier are finished.

7.8. Public Procurement Fraud - Examples

Procurement fraud is the manipulation of a procurement process. In a typical scenario, a vendor is engaged for a contract above the market price in exchange for a kickback in the form of cash, material goods, or other benefits for the employee awarding the contract. Procurement fraud also includes the manipulation of the bidding process among vendors. And it can also include fraud that happens after the contract has been awarded, with a supplier delivering subpar materials for example.

Examples of procurement fraud schemes

Bad actors have many ways of carrying out procurement fraud. Some schemes involve collusion between an insider and a contractor; others involve illegal collusion among vendors. Some types of procurement fraud may occur simultaneously. Here are some common procurement fraud schemes.

Employee contractor collusion/bribery

In this scenario, an employee responsible for the procurement process favors one vendor over another or awards a contract above market price. They do this in exchange for kickback money, goods, or services.

Conflict of interest

Conflict of interest in a procurement process is when a vendor is selected based on a personal relationship: the procurement manager awards a contract to a friend or family member based on that relationship rather than on specific objective criteria. They may do this as a personal favour or in exchange for some kind of material reward.

Bid rigging

Bid rigging involves collusion between vendors who manipulate the bids the business or government agency receives. Contractors may collude to offer identical prices, raise prices, remove competition, etc. In all of these cases, it's the business or government agency that loses out.

Product substitution

This scheme occurs after a contract is won. The contractor swaps out the promised goods or products for other, cheaper ones and pockets the difference. Substitute goods may be sub-standard, faulty, not certified, falsely certified, not meet specifications, etc. This kind of scheme can end up being extra costly if the business or government agency in question needs to replace the faulty products or repair damage done by them. In extreme cases product substitution can also have a dire human cost (think of faulty medical devices or subpar construction materials).

Price fixing

Price fixing, closely related to bid rigging, is a collusive scheme in procurement fraud where vendors agree to manipulate bid prices, often to artificially inflate costs. Competing suppliers coordinate their bids, deciding in advance who will win the contract and at what price, thereby eliminating genuine competition.

Following examples of the presentation are self-explaining and there is no need for further clarifications.

8. Cost Benefit Analysis (CBA)

8.1. CBA – Definition and purpose

CBA is a method of evaluation that attempts to estimate and compare the total benefits and costs of a particular policy proposal.

In principle, CBA measures the efficiency or resource allocation effects of a change. It calculates the Euro value of the gains and losses for all people affected. If the sum is positive, the benefits exceed the costs and the proposal would increase efficiency.

CBA is useful because it:

- provides decision makers with quantitative and qualitative information about the likely effects of a regulation.
- encourages decision makers to take account of all the positive and negative effects of the proposed regulation, and discourages them from making decisions based only on the impacts on a single group within the community.
- assesses the impact of proposals in a standard manner, which promotes comparability, assists in the assessment of relative priorities and encourages consistent decision making.
- captures the various linkages between the proposal and other sectors of the economy (for example, increased safety may reduce health care costs), helping decision-makers maximise net benefits to society.
- helps identify cost-effective solutions to problems by identifying and measuring all costs.

Even when it is difficult to estimate some costs or benefits with precision, CBA makes clear and transparent the assumptions and judgements that have been made. Attempting to quantify costs and benefits also encourages analysts to examine these factors more closely.

CBA is explicitly required, among other elements, as a basis for decision making on the co-financing of projects included in operational programmes (OPs) of the European Regional Development Fund (ERDF) and the Cohesion Fund.

CBA is an analytical tool to be used to appraise an investment decision in order to assess the welfare change attributable to it and, in so doing, the contribution to EU cohesion policy objectives. The purpose of CBA is to facilitate a more efficient allocation of resources, demonstrating the convenience for society of a particular intervention rather than possible alternatives.

8.2. CBA - Steps

Specify the set of options

Identify a range of genuine, viable, alternative policy options to be analysed. You must consider at least three options, one of which must be non-regulatory. Your agency is responsible for the choice of options. A 'do nothing' or 'business as usual' option will usually provide the base case against which the incremental costs and benefits of each alternative are determined. In some cases, doing nothing may be the best option available. Only costs and benefits that would not have occurred in the base case should be included in the CBA.

Decide whose costs and benefits count

For most proposals, measuring the national costs and benefits is appropriate, rather than measuring any international impacts. That is, as far as is practical, you should count the costs and benefits to all people residing in your area.

Identify the impacts and select measurement indicators

Identify the full range of impacts of each of the options. It is important to identify the incremental costs and benefits for each option, relative to the base case (which will normally be 'what would happen if the current arrangements were to continue?').

Where relevant, the base case should be forward-looking, recognising that the world in which the policy will be implemented may differ from the current situation (key variables may change in the future, meaning that current or historical parameters may not be the most relevant benchmark). That is, the base case should not simply assume that nothing will change over time - changes that can be reasonably expected should be recognised when identifying impacts of each option.

All the effects of a proposal that are considered desirable by those affected are benefits; all undesirable effects are costs. CBA requires you to identify explicitly the ways in which the proposal makes individuals better or worse off.

The choice of indicators to measure the impacts depends on data availability and ease of monetisation. For example, a proposal may reduce risks of a hazard. Its positive impact could be measured in terms of a reduced number of accidents. The benefit from accidents avoided could be valued in Euros (see Step 5).

Predict the impacts over the life of the proposed regulation

The impacts should be quantified for each time period over the life of the proposed regulation. The total period needs to be long enough to capture all the potential costs and benefits. Because of the uncertainty involved in forecasting costs and benefits over long periods, exercise caution when adopting an evaluation period longer than, say, 20 years (although some environmental policy may merit the use of a longer time horizon).

Predicting future impacts is difficult. There will always be some uncertainty about the outcome of a proposal. Conducting an assessment of uncertainties should be a standard component of the evaluation of any major proposal. This means that you assess expected values and variability of cost and benefit flows, as well as taking downside risks into account.

A CBA should present the best estimates of expected costs and benefits, along with a description of the major uncertainties and how they were taken into account. You need to set out how costs and benefits are likely to vary with general economic conditions and other influences. For example, would large relative price changes (such as a rise in energy prices or real wages) significantly change the net benefits from the proposal? If so, what price path might be expected? In general, your CBA should not just assume that the net benefits for one year will be repeated every year.

Although it is difficult to predict what the effects of a proposed policy might be in 10 or 20 years - or in some cases, even to attach objective probabilities to various scenarios - decisions require some assumptions to be made. A CBA should make those assumptions transparent. When you explicitly consider and justify the assumptions underlying the forecasts, it improves implementation planning and identifies where more effort should be made to improve the analysis. It is a first step towards dealing with the uncertainties that the proposal may create.

Monetise (place € values on) impacts

Assigning a net Euro value of the gains and losses of an initiative for all people affected is one useful way to measure the effects of a proposed change. Measurement of costs and benefits in this way is sometimes referred to as monetising costs and benefits.

The amount an individual would pay to obtain (or avoid) a change (if that were necessary or possible) is one measure of the value of that change to them. The value could be positive or negative depending on whether the change makes them better or worse off. Summing these values across all affected people gives the community's total willingness to pay for the change. If the sum is

positive, the change increases efficiency. The costs and benefits to all people are added without regard to the individuals to whom they accrue: a € 1 gain to one person cancels a € 1 loss to another.

This “a Euro is a Euro” assumption enables resource allocation to be separated from distribution effects - or efficiency from equity effects. That does not mean that distributional considerations are unimportant or should be neglected. It means that they should be brought into account as a separate part of the overall analysis of the proposal in question - which may be more important than the resource allocation assessment, but should be distinct from it.

Euro values can be estimated from observed behaviour. You can measure the value people place on something by observing how much they actually pay for certain goods or services, and the quantities of those goods and services that are consumed. Market behaviour reveals people’s valuations (or is at least a guide to them). For example, if a consumer pays € 3 for a cup of coffee, the value they place on the coffee is at least € 3 (it will likely be higher).

That said, monetisation, or more general quantification, can be difficult because impacts are sometimes uncertain, some are difficult to value in Euro terms, and some are both uncertain and difficult to value. Environmental goods or safety provisions are typical examples of goods that are difficult to place Euro values on, as they are typically not traded in markets.

The fact that some impacts may be very difficult to quantify in Euro terms does not invalidate the CBA approach. In such cases, a detailed qualitative analysis will often be most appropriate in place of Euro values. Your qualitative analysis should be supported by as much evidence and data as possible to increase the transparency of the report and to assist the decision maker in choosing between alternative options.

Discount future costs and benefits to obtain present values

Why discount?

The need to discount future cash flows can be viewed from two main perspectives, both of which focus on the opportunity cost of the cash flows implied by the policy. The first perspective is the general observation that individuals prefer a Euro today to a Euro in the future. This is most obvious in the fact that banks need to pay interest on deposits to entice individuals to waive current spending. This general preference for current consumption is known as the ‘rate of time preference’ and relates to all economic benefits (and costs), not just those that are financial in nature.

Since individuals are not indifferent between cash flows from different periods, those flows cannot be directly compared. For monetised flows to be directly comparable in a CBA, those costs or benefits incurred in the future need to be discounted back to current Euro terms. This reflects society's preferences, which place greater weight on consumption occurring closer to the present.

The second perspective is that flows of costs and benefits resulting from a regulation also have an opportunity cost for investment. When regulations impose costs on individuals or businesses, those costs will need to be funded in some way. This funding imposes costs on the affected party, either through the interest paid for borrowing the money, or the returns forgone when the funds are not used for other purposes.

The regulation will therefore only be beneficial when it provides a return in excess of the cost to society of deferring consumption, or of the return that could have been earned on the best alternative use of the funds. By applying a discount rate to future cash flows, the required rate of return is explicitly taken into account in the net present value calculation.

Either approach demonstrates that the need to discount future cash flows can be viewed in terms of the opportunity cost of the cash flows, whether this is the cost of delaying consumption or the alternative investment opportunities forgone. Since most of the costs and benefits of proposals are spread out over time, and their value depends on when they are received, discounting is crucial to CBA.

Accounting for inflation

Inflation is another reason that a Euro in the future is worth less than a Euro now. A general rise in the price level means that a Euro in the future buys fewer goods. Analysts conducting a CBA have the choice of whether to include future cash flows in terms of their actual monetary value at the future date (the 'nominal' value) or in terms of their current Euro value (the 'real' value). However, since all cash flows need to be converted to current Euro terms to be comparable in a CBA, it is usually simplest to adopt the latter approach.

CBA measures the value people place on various outcomes, preferably using their willingness to pay as revealed by their market behaviour. Consequently, the preferred approach is to base the discount rate on market-based interest rates, which indicate the value to the current population of future net benefits. Market interest rates determine the opportunity cost of any capital used by the Government's proposal - that is, what it would have produced in its alternative use.

TSI ref.23SI05

In private economy there is uncertainty about the appropriate discount rate to use for proposals. It is uncertain what the alternative uses for capital used by a proposal would have been, and what the capital would have produced in those uses.

According to Annex III to the Implementing Regulation on application form and CBA [cost-benefit analysis] methodology, for the programming period 2014–2020 the European Commission recommended that for the social discount rate 5% is used for major projects in Cohesion countries and 3% for the other Member States.

TSI ref.23SI05

Costs – Examples:

The main source of **financing costs** of projects is

Money

- Opportunity cost of using cash on hand or cash reserve
- Interest or investment potential
- Funds not available for other projects

If needed money is not available, the project has to be financed by e. g.:

- Local loans, state loans, bond issue, Interest rates, Availability of money to borrow, Statutory limits, administrative costs, Funding through donations (EU, IMF, WB)

Tools/Consideration

- Net Present Value determination
- Bond Rating
- Financial Trend Analysis

Opportunities to be considered

- What could you do with money if didn't spend it on this project
- What other public need will not be fulfilled if this project is undertaken

Other costs

Time

- What is the cost in time?
- Staff time
- Elected official's time
- Information technology time
- Other equipment time
- Other projects postponed time

Other costs

Personnel/Equipment - In addition to time cost:

- Will you need to hire additional personnel?
- How much wear & tear on equipment?
- What new equipment will be needed?
- Insurance costs
- Fuel costs

Other costs

Maintenance costs

- Direct and indirect expenses of upkeep, repairs, replacement, and all maintenance activities.

TSI ref.23SI05

Operating costs

- Expenses which are related to the operation of a business, or to the operation of a device, component, piece of equipment or facility.
- Costs of resources used by an organization just to maintain its existence.

Benefits – Examples:

Monetary profits

- Income over the economic life of the investment
- Park and ride facility – Parking Fees
- Museum – Entrance Fees
- Economic Park – Rental Income, Taxes, etc.

Other (partly non-monetary) benefits

- Increase in public safety or accessibility
- Increased capacity
- Increased recreational opportunities
- Increased economic development opportunities
- Improved quality of life
- More efficient operations
- Lower/Higher taxes

Funding and/or Financing Gap

The simple formula is the disparity between what you have (or can access) and what you need or you have to subtract your available resources from your total requirements.

Compute the net present value of each option

The net present value (NPV) of an option equals the present value of benefits minus the present value of costs.

If the NPV is positive, the proposal improves efficiency. If the NPV is negative, the proposal is inefficient. If all costs and benefits cannot be valued in Euros, you should outline why the non-monetised costs and benefits are large or small relative to the monetised impacts.

Perform sensitivity analysis

There may be considerable uncertainty about predicted impacts and their appropriate monetary valuation. Sensitivity analysis provides information about how changes in different variables will

affect the overall costs and benefits of the proposed regulation. It shows how sensitive predicted net benefits are to different values of uncertain variables and to changes in assumptions. It tests whether the uncertainty over the value of certain variables matters, and identifies critical assumptions.

If sensitivity analysis is to be useful to decision makers, it needs to be done systematically and presented clearly. Common approaches to sensitivity analysis include the following:

Worst/best case analysis:

The base case assigns the most plausible values to the variables to produce an estimate of net benefits that is thought to be most representative. The worst, or pessimistic, scenario assigns the least favourable of the plausible range of values to the variables. The best, or optimistic, scenario assigns the most favourable of the plausible range of values to the variables. If the pessimistic scenario gives an NPV below zero, you will need to investigate the critical elements driving the value of the proposal, using the following two techniques.

Partial sensitivity analysis:

Examines how net benefits change as one variable varies over a plausible range (holding other variables constant). It should be used for the most important or uncertain variables, such as estimates of compliance costs, forecasts of benefits and the discount rate. It may be important to vary the values assigned to “intangibles”, especially when the assumed values are controversial. Partial sensitivity analysis clarifies for decision makers how the CBA results are affected by uncertainty about the level or value of a variable. If you find that varying a parameter has large effects on the net benefits from the proposed regulation, uncertainty about its value becomes important.

Monte Carlo:

Sensitivity analysis creates a distribution of net benefits by drawing key assumptions or parameter values from a probability distribution. While this is a more statistically robust approach to sensitivity analysis, care needs to be taken in adopting reasonable and justified assumptions about the probability distributions that have been assumed.

If the net present value does not change from a net benefit to a net cost (or vice versa) after considering the range of scenarios, there can be confidence in the efficiency effects of the proposal.

Reach a conclusion

You should summarise the results of the CBA. The option with the highest net benefit should be your recommended option. Given that NPVs are predicted (average) values, the sensitivity analysis might suggest that the alternative with the largest NPV is not necessarily the best alternative under all circumstances. For example, you might be more confident in recommending the option with a lower expected value of net benefits, but with a smaller chance of imposing a significant net cost on the community (lower “downside risks”).

Your conclusion should include the time profiles of costs, benefits and net benefits, their NPVs, the discount rate used, information on the sensitivity of estimated impacts to alternative assumptions, a list of assumptions made, and how costs and benefits were estimated.

8.3. CBA - Costs and benefits that are difficult to value

When a proposal uses and produces goods sold in markets, estimating costs and benefits is in most cases conceptually more straightforward.

However, it is often difficult to identify and measure the effects of a proposal, especially when there are impacts on goods not traded in markets, such as pollution levels and access to scenic views.

Costs and benefits can be difficult to value in Euro because their magnitude may be unknown or uncertain, or because they are difficult to express in money terms even if their impact is known. Examples include environmental, social and cultural considerations, regional impacts, health and safety, publicity, and national defence.

It is important that you identify and describe all costs and benefits. You should then quantify them as much as possible. When valuations are uncertain, sensitivity analysis should be used to test how varying the value assigned affects the overall viability of the proposal. If the impacts cannot be valued, they should still be quantified in non-monetary terms. For example, a policy to reduce pollution could quantify the expected reduction in emissions. The quantification should aim to identify matters such as the assumptions applied to determine the effects, the impact on the community (such as how many people are affected and how) and the likelihood of the full impact being realised.

Where impacts cannot be valued, the reasons why that is the case should be set out clearly.

The process of trying to describe and measure costs and benefits is valuable in itself. By examining what determines the costs and benefits and how they are likely to vary, you should consider different approaches and determine the best way to achieve the intangible objectives. Is the policy the best way of producing them, or could a better outcome be produced by some alternative? Even qualitative descriptions of the pros and cons associated with a contemplated action can be helpful.

A wide range of tools have been developed to help you to estimate the value of costs and benefits when direct market information is not available, including revealed preference techniques and stated preference techniques.

Some costs and benefits resist the assignment of Euro values. A CBA should nevertheless include all relevant information that can affect a decision in such cases. It should make explicit allowance for costs and benefits that cannot be valued. You should report cost and benefit estimates within three categories:

- Monetised;
- quantified, but not monetised;
- qualitative, but not quantified or monetised.

The challenge is to consider non-monetised impacts adequately.

For example, if a proposal is advocated despite monetised benefits falling significantly short of monetised costs, Impact Analysis should explain clearly why non-monetised benefits would tip the balance and the nature of the inherent uncertainties in the size of the benefits.

CBA can encourage decision makers to reveal the limits they place on non-monetised benefits. For example, the monetised costs of a proposal may exceed monetised benefits by € 100.000,-, which equates to a net cost of € 1,50 per resident of the city, over the life of the non-monetised benefit valuable enough to outweigh the net monetised costs? It may be considered reasonable to assume that the residents value the proposal's non-monetised benefits at more than € 1,50 each. But if the cost were, say, €100 per head, it may not be plausible to assume such a high willingness to pay for the non-monetised benefits, depending on the benefits in question.

If quantification is not possible, your analysis should at least describe such intangibles in a qualitative manner and evaluate the strengths and limitations of the relevant arguments for taking those impacts into account. Where possible, include relevant data to support the qualitative analysis. For example, information on the number of people affected by the regulation or the value added of the affected industry may be useful to the final decision maker.

8.4. CBA - Cost-effectiveness analysis

Cost-effectiveness analysis is a widely used alternative to CBA in circumstances where the most important impact cannot be monetised. It compares alternatives on the basis of the ratio of their costs and a single quantified, but not monetised, effectiveness measure, such as lives saved. It may be reasonable to use cost-effectiveness analysis if the effectiveness measure captures most of the policy's benefits.

Cost-utility analysis is a form of cost-effectiveness analysis that employs a more complex effectiveness measure, reflecting both quantity and quality. It is generally used in the area of health care. For example, the benefit measure may be quality-adjusted life-years, which combines the number of additional years of life and the quality of life during those years (usually measured on a scale in which a value of one is assigned to perfect health and zero to death). In cost-utility analysis, the incremental costs of a number of options are compared to the health changes measured in quality-adjusted life-years that they produce.

Examples of the presentation related to

- **The establishment of an industrial park**
- **Parking house P + R Ssun – Koper**
- **New public park versus a community centre**

are self-explaining and there is no need for further clarifications.