

ICT Project Management

Chapter 1: Introduction to Project Management

1.0. Project:

Definition

- Unique process, consisting of a set of coordinated and controlled activities with a start and finish dates, undertaken to achieve an objective conforming to specific requirements including the constraint of time, cost and resources
- *A temporary endeavour undertaken to create a unique product, service or result.*
- Any series of activities and tasks that:-
 - Have a specific objective to be completed with certain specifications
 - Have defined start and end dates
 - Have limited funds
 - Consume resources'
- Any series of activities and tasks that:-
 - Have a specific objective to be completed within certain specifications
 - Have defined start and end dates
 - Have funding limits (if applicable)
 - Consume resources (ie money, time, equipment)'

A project is a complex of interrelated and inter-dependent activities where resources are used in expectation of return and which lends it self to planning, financing and implementing a unit

1.2. Project Versus an Operation

The operations of an organization are continuing and repetitive activities that are executed to achieve its mission and sustain the business, but without a definable end to their performance and without a unique output—that is, it is not produced or provided only once.

1.3. A Project Versus a Program

A project differs from a program in that “a program is a group of related projects managed in a coordinated way to obtain benefits and control not available from managing them individually.

1.4. Examples of Information Communication Technology Projects – ICTD Projects

Projects can be large or small and involve one person or thousands of people. They can be done in one day or take years to complete. Information technology projects involve using hardware, software, and/or networks to create a product, service, or result.

ICT Projects that focus on the effective use of information and communication technology for development (ICTD) have emerged in the last three decades of the 20th century. ICTD projects are similar to conventional projects in that they are transitory undertakings that use resources, incur costs, and are expected to produce deliverables over a period of time. Projects are meant to solve problems and meet challenges. They may also serve as test cases and proof of concepts or take-off points for developing new solutions. In ICTD projects, ICT-based solutions are developed that meet needs or address a problem. These projects introduce processes and methodologies that are supported by ICT. They introduce technological changes in an organization that are intended to be beneficial to the organization and its target group. Some ICTD projects address and support larger development goals such as the Millennium Development Goals.

Given the constraints of funds, time and resources, policymakers need to understand the meaning and processes of managing projects, and more particularly ICTD projects, to raise its success rate, provide benefits for people and their organizations, and improve the quality of life of citizens. Studies have shown that ICTD projects have a high failure rate, in part because of poor project design and management.

Examples of information technology projects include the following:

- A help desk or technical worker replaces laptops for a small department
- A small software development team adds a new feature to an internal software application
- A college campus upgrades its technology infrastructure to provide wireless Internet access
- A cross-functional task force in a company decides what software to purchase and how it will be implemented
- A company develops a new system to increase sales force productivity
- A television network develops a system to allow viewers to vote for contestants and provide other feedback on programs
- The automobile industry develops a Web site to streamline procurement
- Project to develop standards for a new communications technology

1.5. Project Attributes

As you can see, projects come in all shapes and sizes. The following attributes help to define a project further:

1. **A project has a unique purpose.** Every project should have a well-defined objective. For example, many people hire firms to design and build a new house, but each house, like each person, is unique.
2. **A project is temporary.** A project has a definite beginning and a definite end. For a home construction project, owners usually have a date in mind when they'd like to move into their new homes.
3. **A project is developed using progressive elaboration or in an iterative fashion.** Projects are often defined broadly when they begin, and as time passes, the specific details of the project become more clear. Therefore, projects should be developed in increments. A project team should develop initial plans and then update them with more detail based on new information. For example, there are many decisions that must be made in planning and building a new house. It works best to draft preliminary plans for owners to approve before more detailed plans are developed.
4. **A project requires resources, often from various areas.** Resources include people, hardware, software, or other assets. Many projects cross departmental or other boundaries to achieve their unique purposes. Resources, however, are limited. They must be used effectively to meet project and other corporate goals.
5. **A project should have a primary customer or sponsor.** Most projects have many interested parties or stakeholders, but someone must take the primary role of sponsorship. The **project sponsor** usually provides the direction and funding for the project.
6. **A project involves uncertainty and Risk.** .. possesses significant elements of uncertainty and risk. Because every project is unique, it is sometimes difficult to define the project's objectives clearly, estimate exactly how long it will take to complete, or determine how much it will cost. External factors also cause uncertainty, such as a supplier going out of business or a project team member needing unplanned time off. This uncertainty is one of the main reasons project management is so challenging, especially on projects involving new technologies.
7. A project follows a planned, organized method to meet its objectives with specific goals of quality and performance

1.6. Project Life Cycle

The **project** lifecycle describes the tasks that must be completed to produce a product or service. Different project lifecycles exist for specific products and services. The ICT - Project Life Cycle (PLC) is intended to provide a set of guidelines for the successful completion of application development projects. The PLC consists of six distinct phases as shown

Phase	Deliverable	Can this be outsourced	
		Consultant	Supplier
Planning	Quality Assurance[2]		
	Feasibility Study	Unlikely	No
	Tender Document	Yes	No
	Contract Document	No	No
Definition	Project Plan	Yes	Yes
Analysis	Requirements Specification	Unlikely	Yes
	System Analysis document	Unlikely	Yes
	Data Migration analysis	Yes	Yes

Phase	Deliverable	Can this be outsourced	
Design	Detailed System Design	Unlikely	Yes
	Data Migration design	Unlikely	Yes
Build	Complete System Architecture Definition	No	Yes
	Application forms and reports	No	Yes
	Tested application	No	Yes
	Data conversion	No	Yes
Implementation	Implementation plan	Unlikely	Yes
	Online help text	No	Yes
	User acceptance test	Yes	Unlikely
	User training planning	Yes	Yes
	User procedures	No	Yes
	Application delivery		

1.7. Project Management?

Project management is a method, a discipline, and a process.

Definition

- *“Project management is the process of the application of knowledge, skills, tools, and techniques to project activities to meet project requirements.”*
- *Project management is the discipline of planning, organizing, securing, and managing resources to achieve specific goals.*
- *Project management is also a discipline of planning, organizing, and managing resources to deliver all the work required to complete a project within defined scope, time, and cost constraints.*

That is, project management is an interrelated group of processes that enables the project team to achieve a successful project. These processes manage inputs to and produce outputs from specific activities; the progression from input to output is the nucleus of project management and requires integration and iteration.

Project management is a series of activities embodied in a process of getting things done on a project by working with project team members and other stakeholders to attain projects schedule, cost and technical performance objectives. The project management process is adapted from the general management process which involves Planning, Organization, Motivation, Directing and Control.

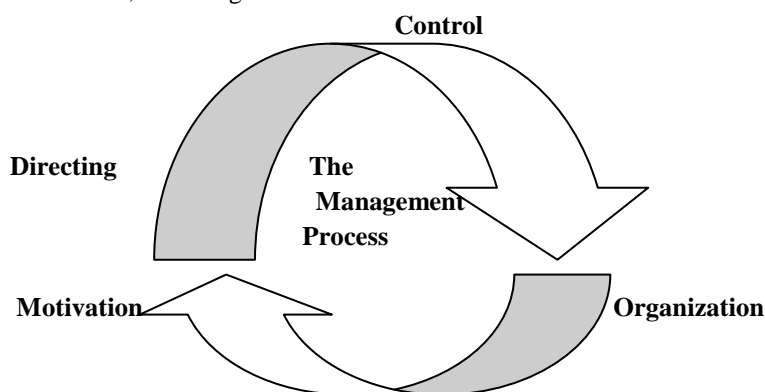


Fig. 1. The Management Process

Source: Project Management : Strategic Design and Implementation, 2002

1.7.1. Vital Factors of Project Management

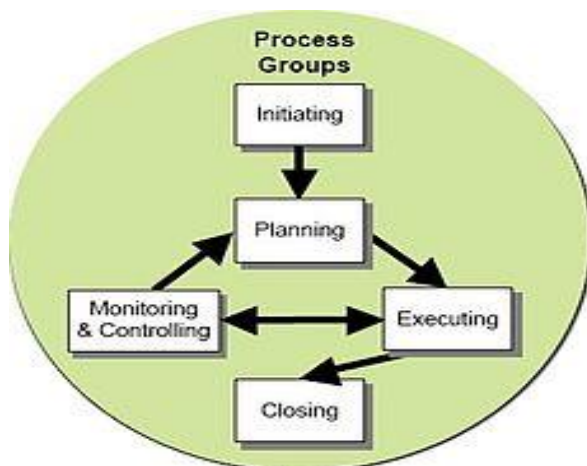
The vital factors of project management are elements or variables that impact on the quality and speed of a project. These are people, process and technology. They are influential factors to project performance in achieving the project's goals or objectives. Defining, balancing and integrating the relationships among these elements can result in the project's optimum performance.

- 1) **People:** Projects are developed, managed and implemented by people. These entail component processes and activities that require the services of competent professionals to work together as a team. Project managers have to understand the roles and participation of people in the project, including stakeholders and beneficiaries. They need to manage the expectations of the people involved in the project. Stakeholders' analysis will be useful to conduct during project initiation to ensure the magnitude of participation of people in the project. Ownership of the project by beneficiaries must be emphasized because ultimately, they will be the ones using, integrating and sustaining the products or systems developed by the project.
- 2) **Process:** A process that runs well relies on good procedural design by management and adherence to the process by the project implementers or staff. A well-designed and precise process can lead to the discovery of potentialities, and enhance the capabilities or competencies of project staff members resulting in self-propelling staff, which is vital to the success of internal project management. In most ICT projects, one of the work components is process re-engineering, which means that the activities and documentation are reviewed to remove redundancies or unnecessary processes. If this review is not done, the old process will produce the same inefficient or ineffective results.
- 3) **Technology:** This refers to the machines and/or software that are available in the market that are used to support the needs and processes of the organization. Technology should not dictate or take the lead in addressing organizational or project needs. Instead, it should be used in support of the needs of the people in the organization. In ICT-enabled community projects, technology should take the back seat until the needs of people and processes are defined. Projects that put technology before the users' needs and process requirements often fail, resulting in a waste of resources and cost). When it is selected well, appropriately used, and built on a stable platform, technology can make project processes efficient and accelerate the project workflow

1.8. Project Management Phases & Project management knowledge areas

Project Management is accomplished through the application and integration of the project management processes which are organised in five distinct phases (also called process groups):

1. Initiating
2. Planning
3. Executing
4. Monitoring and Controlling, and
5. Closing.



1. **Initiation:** During this phase a business problem or opportunity is identified and a business case providing various solution options is defined. Next, a feasibility study is conducted to investigate whether each option addresses the business problem and a final recommended solution is then put forward.
2. **Project planning:** includes devising and maintaining a workable scheme to ensure the project addresses the organization's needs. It involves outlining the activities, tasks, dependencies and timeframes; resource plan; financial plan; quality plan; acceptance plan; and procurement plan.
3. **Project execution:** This phase involves implementing the plans created during the project planning phase to produce the products, services or results. This phase involves coordinating people and resources, as well as integrating and performing the activities of the project in accordance with the plan.

4. Monitoring and controlling consists of those processes performed to regularly measure and monitor project execution progress to ensure that the project team meets the project objectives. Potential problems can thus be identified in a timely manner and corrective action can be taken, when necessary, to control the execution of the project. This phase includes, for example:
 - Monitoring the ongoing project activities against planning and project performance indicators;
 - Influencing the factors that could circumvent integrated change control so that only approved changes are implemented.
5. Project closure: Project closure involves releasing the final deliverables to the customer, handing over project documentation to the business, terminating supplier contracts, releasing project resources and communicating the closure of the project to all stakeholders.

Each project management process has clear and well-defined inputs (possibly being outputs of other processes) and outputs (which in turn may become input to other processes). Furthermore, each project management process belongs to one of nine specific knowledge areas pertaining to project management.

1.8.1. Project Management Knowledge Areas

Project management knowledge areas describe the key competencies that project managers must develop.

1. **Integration Management**, which includes the processes and activities that integrate the various elements of project management, which are identified, defined, combined, unified and coordinated within the project management phases.
 - Develop Project Charter
 - Develop Preliminary Scope Statement
 - Develop Project Management Plan
 - Direct and Manage Project Execution
 - Monitor and Control Project Work
 - Integrated Change Control
 - Close Project
2. **Scope Management**, which includes the processes involved with working with all appropriate stakeholders to define and ascertaining that the project includes all the work required, and only the work required, to complete the project successfully.
 - Scope Planning
 - Scope Definition
 - Create WBS
 - Scope Verification
 - Scope Control
3. **Time Management**, which includes the processes concerning the timely completion of the project. It includes estimating how long it will take to complete the work, developing an acceptable project schedule given cost effective use of available resources and ensuring timely completion of the project.
 - Activity Definition
 - Activity Sequencing
 - Activity Resource Estimating
 - Activity Duration Estimating
 - Schedule Development
 - Schedule Control
4. **Cost Management**, which includes the processes involved in planning, estimating, budgeting and controlling costs so that the project is completed within the approved budget.
 - Cost Estimating
 - Cost Budgeting
 - Cost Control

5. **Quality Management**, which includes the processes involved in assuring that the project will satisfy the objectives for which it was undertaken.
 - Quality Planning
 - Perform Quality Assurance
 - Perform Quality Control
6. **Risk Management**, which includes the processes concerned with conducting risk management on a project.
 - Risk Management Planning
 - Risk Identification
 - Qualitative Risk Analysis
 - Quantitative Risk Analysis
 - Risk Response Planning
 - Risk Monitoring and Control
7. **Human Resource Management**, which includes the processes that organise and manage the project team.
 - Human Resource Planning
 - Acquire Project Team
 - Develop Project Team
 - Manage Project Team
8. **Communications Management**, which includes the processes concerning the timely and appropriate generation, collection, dissemination, storage and ultimate disposition of project information.
 - Communications Planning
 - Information Distribution
 - Performance Reporting
 - Manage Stakeholders
9. **Procurement Management**, which include the processes that purchases, or acquires or procures products, services or results from outside the performing organization, as well as contract management processes.
 - Plan Purchase and Acquisitions
 - Plan Contracting
 - Request Seller Responses
 - Select Sellers
 - Contract Administration
 - Contract Closure

Core Knowledge Area

The four core knowledge areas of project management include; project scope, time, cost, and quality management. These are core knowledge areas because they lead to specific project objectives.

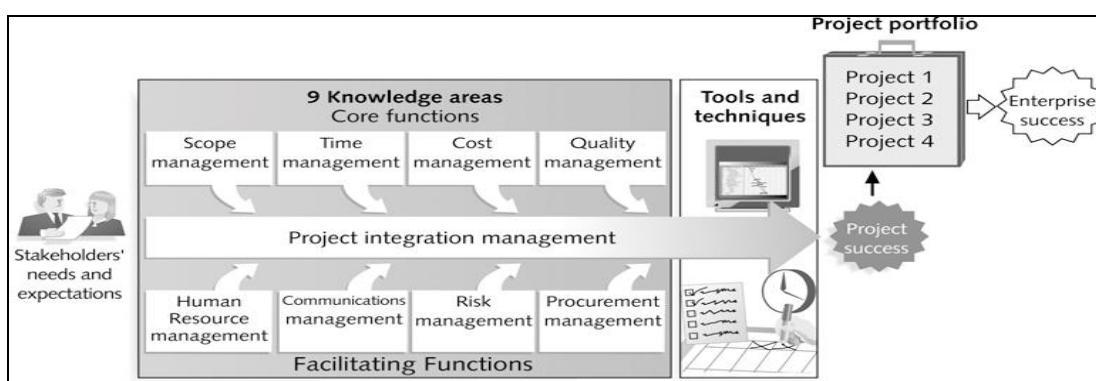


Figure 1-3. Project management framework (Schwalbe, Information Technology Project Management, Sixth Edition, 2010)

Project Stakeholders

Stakeholders are the people involved in or affected by project activities and include the project sponsor, project manager, project team, support staff, customers, users, suppliers, and even opponents to the project. These stakeholders often have very different needs and expectations.

1.9. Project Management Tools and Techniques

Project management tools and techniques assist project managers and their teams in carrying out work in all nine knowledge areas. For example, some popular time-management tools and techniques include Gantt charts, project network diagrams, and critical path analysis.

Figure 1-4 lists some commonly used tools and techniques by knowledge area.

Knowledge Area/Category	Tools and Techniques
Integration management	Project selection methods, project management methodologies, stakeholder analyses, project charters, project management plans, project management software , change requests , change control boards, project review meetings, lessons-learned reports
Scope management	Scope statements, work breakdown structures, mind maps, statements of work, requirements analyses , scope management plans, scope verification techniques, and scope change controls
Time management	Gantt charts , project network diagrams, critical-path analyses, crashing, fast tracking, schedule performance measurements
Cost management	Net present value, return on investment, payback analyses, earned value management, project portfolio management, cost estimates, cost management plans, cost baselines
Quality management	Quality metrics, checklists, quality control charts, Pareto diagrams, fishbone diagrams, maturity models, statistical methods
Human resource management	Motivation techniques, empathic listening, responsibility assignment matrices, project organizational charts, resource histograms, team building exercises
Communications management	Communications management plans, kickoff meetings , conflict management, communications media selection, status and progress reports , virtual communications, templates, project Web sites
Risk management	Risk management plans, risk registers, probability/impact matrices, risk rankings
Procurement management	Make-or-buy analyses, contracts, requests for proposals or quotes, source selections, supplier evaluation matrices

Figure 1-4. Common project management tools and techniques by knowledge area (Schwalbe, Information Technology Project Management, Sixth Edition, 2010)

1.10. Program and Project Portfolio Management

Programs

A **program** is “a group of related projects managed in a coordinated way to obtain benefits and control not available from managing them individually.”

Project Portfolio Management

In many organizations, project managers also support an emerging business strategy of **project portfolio management** (also called just **portfolio management** in this text), in which organizations group and manage projects and programs as a portfolio of investments that contribute to the entire enterprise’s success.

Definition: “the continuous process of selecting and managing the optimum set of project initiatives that deliver maximum business value.” (Pacific Edge Software’s product manager, Eric Burke)

1.11. Project & Project Management Constraints

Every project is constrained in different ways. Some project managers focus on scope, time, and cost constraints. These limitations are sometimes referred to in project management as the **triple constraint**. To create a successful project, a

project manager must consider scope, time, and cost and balance these three often-competing goals. He or she must consider the following constraints;

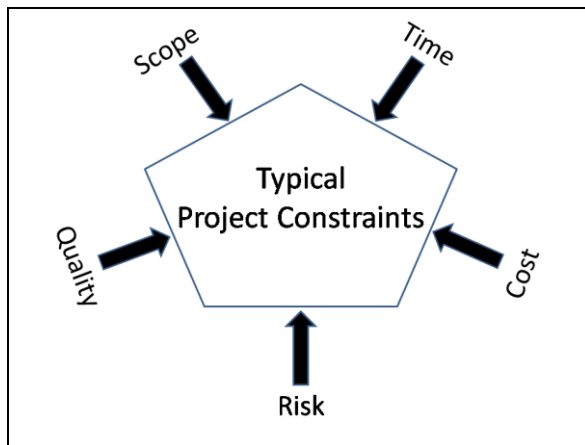


Fig 1.1. Typical project constraints

- 1) **Scope** is what the project is trying to achieve, it entails all the work involved in delivering the project outcomes and the processes used to produce them; it is the reason and the purpose of the project. Scope is the boundary of a project, it is what the beneficiaries, and the donors expect from the project, nothing more, and nothing less.
- 2) **Budget** or the costs approved for the project including all required expenses needed in order to deliver the project. In development projects managers have to balance between not running out of money and not under spending, because many projects receive funds or grants that have contract clauses with a 'use it or lose it' approach to project funds. Poorly executed budget plans can result in a last minute rush to spend the allocated funds.
- 3) **Schedule** is defined as the time required to complete the project. The project schedule is often the most frequent project oversight in developing projects. This is reflected in missed deadlines, incomplete activities, and late donor reports. Proper control of the schedule requires the careful identification of tasks to be performed, an accurate estimation of their durations, the sequence in which they are going to be done, and how people and resources are allocated.
- 4) **Quality** is defined as delivering the project outcomes according to the stated or implied needs and expectations of the project beneficiaries and donor agency, in order to meet stakeholder satisfaction. It also means complying with quality standards that are either mandated by the donor, local government (such as laws and regulations), or by professional standards (such as health).
- 5) **Risk:** How much uncertainty are we willing to accept on the project?

Managing these constraints is the main responsibility of the project manager. Each constrain has a specific goal and a project is deemed successful when it achieves all four, failure in any of them has an impact in the others, a delay in a project has an impact on its cost, and an increase in scope has an impact in both time and budget.

1.12. Benefits of Project Management

Many organizations claim that using project management provides advantages, such as:

- Better control of financial, physical, and human resources
- Improved customer relations
- Shorter development times
- Lower costs
- Higher quality and increased reliability
- Higher profit margins
- Improved productivity

- Better internal coordination
- Higher worker morale

1.13. Project Manager

Project manager is the person who has the overall control of project and shoulders responsibilities for its execution and performance. A project manager is either a specialist or a person having predominantly technical background with sufficient experience, exposure, expertise on multifaceted, multidimensional and multidisciplinary projects. The project manager is responsible for the overall project direction according to established business objectives and contractual requirements regarding technical specifications, schedules and budgets

Responsibilities

- Establishing and maintaining the project plan
- Update and maintain the project plan during the project life cycle, including the issuance of work authorizations and budgets for each work package in accordance with the master plan
- effective managing and control the project according to established customer requirements and business objectives
- Building and maintaining the necessary communication channels among the project team members, to the project customers or the organization management
- Determines the type and extent of management tools to be employed to facilitate communication among the project stakeholders

Suggested Skills for Project, Program, and Portfolio Managers

A project manager must have a range of skills including:

1. Leadership;
2. People management (customers, suppliers, functional managers and project team);
3. Effective communication (verbal and written);
4. Influencing;
5. Negotiation;
6. Conflict management;
7. Planning;
8. Contract management;
9. Estimating;
10. Problem solving;
11. Creative thinking; and
12. Time management.

Others include;

1. All nine project management knowledge areas: A project manager leading a large software development project must know a lot about that application area.
2. The application area (domain, industry, market, etc.):
3. The project environment (politics, culture, change management, etc.) The project environment differs from organization to organization and project to project, but there are some skills that will help in most project environments. These skills include understanding change, and understanding how organizations work within their social, political, and physical environments.
4. General management (financial management, strategic planning, etc.): Project managers should also possess general management knowledge and skills. They should understand important topics related to financial management, accounting, procurement, sales, marketing, contracts, manufacturing, distribution, logistics, the supply chain, strategic planning, tactical planning, operations management, organizational structures and behavior, personnel administration, compensation, benefits, career paths, and health and safety practices.
5. Human relations (leadership, motivation, negotiations, etc.): Achieving high performance on projects requires human relations or soft skills. Some of these soft skills include effective communication, influencing the organization to get things done, leadership, motivation, negotiation, conflict management, and problem solving. Project managers must lead their project teams by providing vision, delegating work, creating an energetic and positive environment, and setting an example of appropriate and effective behavior.
6. Team leadership skills and be able to work as team player as projects management process is a team work process.

1.13.1. Project Management Plan (PMP)?

A project management plan is a fundamental tool for the project manager to deliver the project successfully. This document is a strategic and formalized roadmap to accomplish the project's objectives by describing how the project is to be executed, monitored and controlled, which includes creating a project work breakdown structure, identifying and planning to mitigate risk, identifying manners in which to effectively communicate with stakeholders and other project team members, and developing a plan to manage changes.

It is essentially a guide for executing the project, and a manner in which to gain buy-in and approval from stakeholders and sponsors prior to commencement. This plan is a living document that is updated and revised throughout the project at strategic milestones or significant events to accommodate the progressive, elaborative nature of the project. The project management plan will vary based on size, complexity, risk, and/or sensitivity of the project. Implementing the project management plan requires competency in all of the project management knowledge areas and is critical to the success of the project.

1.14. Characteristics of Successful Projects

In the funding application process, you clearly defined the objectives of your project, sought partnerships with organizations with similar objectives and developed a detailed action plan for your project. In doing so, you laid the foundations for success. Consider the following traits that characterise successful projects:

1. **Clear objectives**- The most successful projects have clearly defined objectives from the outset.
2. **A good project plan** - A carefully thought-out plan serves two purposes. First, it allows everyone involved to understand and perform their part in the project. It shows who is responsible for what and estimates how much money, people, equipment and time will be required to complete the project. Second, it serves as a monitoring tool, allowing you to take early action if things go wrong.
3. **Communication, communication, communication** - Your project is a collaborative effort between all of the individuals and organizations involved. You all need to work together to maintain effective and continual communication between the parties.
4. **A controlled scope** - Numerous issues will come up throughout your project, and not all of them will contribute to your overall objectives. It is important to stay focused on your priorities, with little wasted time or attention.
5. **Stakeholder support**- Projects typically involve several stakeholders, who invest time and resources in the project. It is important to maintain stakeholder support throughout the project, so the project team can meet its objectives.
6. **Participation** – People who are part of the project should be involved at every stage, from the initial needs assessment through to monitoring. A participatory and demand-driven approach increases the impact of ICTD activities.
7. **Local ownership and capacity development** – For projects to be sustainable, they must be locally owned and accompanied by human and organizational capacity development. Physical access is just one element of effective ICT access and use. Local ownership and capacity development will ensure that individuals, communities and organizations can use and maintain ICT systems and gain the full benefits from their use.
8. **Mix of technology** – The choice of technology will depend largely on the context of use. The relationship between the user or audience and the specific media type also needs further exploration. The potential pro-poor impact of any ICT is determined by appropriate choice of technology.
9. **Multi-stakeholder partnerships** – ICT use will have spill over effects beyond individual sectors and programmes and can considerably improve outreach and resource allocation. Multi-stakeholder partnerships are an appropriate response to the complexity of this task in view of the need for increased resources and the fact that development is the responsibility of all sectors of society with multi-level linkages.
10. **Alignment** – The potential benefits for the poor are more likely to be realized when ICTD activities are aligned with the larger demand-driven development efforts of partners, particularly those related to poverty reduction.
11. **Institutional ownership and leadership** – A sense of ownership by and leadership of partner institutions are important. Although successful ICT pilot programmes are often driven by individuals, there must also be an institutional base to extend the project's reach and increase the number of people involved.

12. Competitive enabling environment – An enabling ICT policy environment includes respect for freedom of expression, diversity and the free flow of information, completion of ICT infrastructure provisions, including in the last mile, and investment in service development, including local content and the adoption of open source solutions.
13. Financial and social sustainability – In order for projects to be financially sustainable, all potential costs and revenue generation should be included in the planning process from the start. The issue of social sustainability is of equal importance and is secured through local ownership and capacity building. It is essential for both social and financial sustainability to be considered.
14. Risk considerations – Possible and unforeseeable negative impacts need to be taken into account and carefully monitored, including watching out for how the benefits of ICT-supported interventions may be unequally distributed or even have the opposite of their desired effect – i.e. deepening economic, social and cultural divides rather than reducing poverty.

1.14. Barrier / Risks

Many things can go wrong in project management. These things are often called barriers. Here are some possible barriers:

1. Poor communication;
2. Disagreement;
3. Misunderstandings;
4. Union strikes;
5. Personality conflicts;
6. Poor management; and
7. Poorly defined goals and objectives.

A good project management discipline will not eliminate all risks, issues and surprises, but will provide standard processes and procedures to deal with them and help prevent the following:

1. Projects finishing late, exceeding budget or not meeting customer expectations.
2. Inconsistency between the processes and procedures used by projects managers, leading to some being favoured more than others.
3. Successful projects, despite a lack of planning, achieved through high stress levels, goodwill and significant amounts of overtime.
4. Project management seen as not adding value and as a waste of time and money.
5. Unforeseen internal and/or external events impacting the project.

Project management is about creating an environment and conditions in which a defined goal or objective can be achieved in a controlled manner by a team of people.