**PGD003 - Post Graduate Diploma in Project Planning and Management**

**MODULE 7 – PROJECT LEADERSHIP AND DECISION MAKING; PROJECT FINANCE**

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1. **Explain the project life cycle process with suitable diagrams**

A project is temporary organization of people, activities or tasks, and resources to achieve certain objectives or goals. It has definite start and finish dates and operates within given parameters or scope to which any changes must go through an integrated change management process to keep the project within a certain timeline, and budget. Within the timeline, budget and scope are activities that must be organized in a certain logical way to achieve the desired outcome. For a project to succeed, therefore, there must be a logical flow of how a project unfolds from the start to completion and this is referred to as the project life cycle. Projects take on different forms: manufacturing projects deliver products such as fast-moving consumer goods, steel fabrication; infrastructure projects deliver products in form of roads, bridges, railways; health projects deliver vaccines, systems, drugs; agriculture projects deliver better seeds, fertilizers, vaccines, and improved value chains among others. Each of these follow different trajectories or plans to obtain the goals and objectives of the projects. However, despite the differences in products or procedures, project life cycles encompass 4 key steps to the delivery of a successful project: Conceptualization(initiation), planning, execution/implementation, and termination(closure) of a project.

Figure 1: Steps in a project life cycle (http://www.maxwideman.com/papers/life\_cycle/life\_cycle.pdf

**Conceptualization**: According to Pinto and Prescott (1988), this is the stage at which preliminary goals and alternative courses of action are established along with an exploration of the availability of means to accomplish the envisaged activities. Within the initiation phase, the problem or opportunity is identified, a solution is defined, a project is formed, and a project team is appointed. Some of the steps in conceptualization include those in the illustration below:



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**Planning**: at this stage, formalized plans to accomplish the initially developed goals are established. It is the point at which support from top management is enlisted to commit human and budgetary resources of the organization as required. Planning involves:

* Project plan outlining the activities, tasks, dependencies and timeframes;
* Resource plan listing the labor, equipment and materials required;
* Financial plan identifying the labor, equipment and materials costs;
* Quality plan providing quality targets, assurance and control measures;
* Risk plan highlighting potential risks and actions to be taken to mitigate those risks;
* Acceptance plan listing the criteria to be met for quality;
* Communications plan describing the information needed to inform stakeholders;
* Procurement plan identifying products to be sourced from external suppliers.

**Execution**: This is the point at which the actual work is undertaken. The execution stage takes the greater amount of time given it is the point at which resources are engaged, and materials are procured and transformed into the intended product. It is also when the tangible aspects of the project are rolled out; the product is in the production, the bridges, roads or airport terminals are being constructed, an aircraft’s parts are being manufactured and put together, and lab work for vaccines is being undertaken. This is the point where defects in conceptualization and planning are more evident and where the risks are more likely to be realized and to become issues that need solutions.

Figure 2: timeline through each life cycle stage (Pinto and Prescott, 1988)

**Termination/Closure**: this is the winding up of a project and resources, such as human and material, are released and transferred to other users and the product delivered to the client or beneficiaries. Westland (2006) identifies 5 key aspects of project closure:

* Determining whether all the project completion criteria have been met;
* Identifying any outstanding project activities, risks or issues;
* Handing over all project deliverables and documentation to the customer;
* Canceling supplier contracts and releasing project resources to the business;
* Communicating the closure of the project to all stakeholders and interested parties.

After determining that all processes and procedures, and documentation as pertains to closure have been met, a project manager then submits a project closure report to the project sponsor for approval after which a project can be formally closed.

1. **What are the roles of data collection and report in project completion**

To complete a project and close it, the project manager submits the project completion report to the sponsor or client that contains information on the project from conception to closure with the necessary data and explanatory notes. This data collection and reporting is important as the risk of knowledge loss at a project’s end is a serious problem for organizations, especially in knowledge-intensive industries, such as pharmaceuticals, financial engineering, or high-tech. Companies could save considerable costs, which result from redundant work and the repetition of mistakes. As Schindler and Eppler (2003) point out, numerical data contained in the report mainly answers ‘‘what’’, ‘‘where’’ and ‘‘how many’’ questions, but it goes further to include crucial ‘‘why’’ and ‘‘how’’ questions that are addressed by ‘‘stories’’ coming out of the project or practical examples that showcase either how a project would be run different or why it succeeded or failed as it did.

In recent times, the demand to perform a more detailed analysis at project end and to document the positive and negative experiences gained, is rising. It comprises of lessons learned that are useful for knowledge transfer for future projects. These reports should include conclusions and recommendations, summarizing what can be improved in future projects. Historical data and information is, therefore, important for knowledge management. Team members gain new knowledge and experience that can benefit future projects and each member’s own professional development. It makes project team members share and understand one another’s perspectives, integrates individual and team learning, and brings to the fore hidden conflicts. It documents good practice and problems and increases job satisfaction by giving people feedback about their work (Birk, Dingsøyr & Stålhane, 2002).

Data also helps to avoid the pitfalls of previous projects. Data collection and reporting can allow for comparators with past projects and give an indication of processes and procedures that are more efficient and on which project teams can leverage to ensure projects have a greater chance of success. The Boeing company presents a classic case of data gathering and reporting that influenced some of its practices to make the most successful and error free market launches in its history. To avoid making similar mistakes as in the development of its aircrafts 737 and 747 in later projects, a working group was formed, called ‘‘Project Homework-Team’’. The team had the order to compare project processes of the machines of the 737 and the 747 with those of the types 707 and 727 (two very successful development projects). Based on the data collected on the machines and aircrafts, the team prepared an experience report of the two first projects and presented a book with appropriate recommendations. Some members of the Homework-Team were then moved into the project teams of the 757- and 767-development (Schindler and Eppler, 2003). Without the data collection and the project completion reports, the comparisons of the machines and aircrafts, the processes and procedures followed, would have made it impossible to undertake the ‘project homework team’ successfully. Boeing used these tools as learning tools to re-organize their work and ensure future projects can be modelled around the successful projects to develop new projects and deliver superior aircrafts.

Project completion reports, and the data contained therein can also be used as risk management tools. They can help to answer 4 questions:

1. What was supposed to happen?
2. What actually happened?
3. Why were there differences?
4. What can you learn from this experience?

Project design and planning always projects the anticipated outcomes based on the goals and objectives of the project. At execution, some aspects may need revision or may be impossible to do given the environment and may encounter difficulties or challenges, foreseen and unforeseen, that impact the project. With data, it is possible to go back through the life cycle of the project to understand what issues arose that could be risks to future projects, whether currencies fluctuated and affected the cash flow of the project, whether the anticipated resources were available and what mitigation measures were undertaken. In a sense, an organization can use the report to plan for risks and uncertainties in its future projects.

1. **What is organizational design? Explain your answer with examples**

Organizations are formed whenever the pursuit of an objective requires the realization of a task that calls for the joint effort of two or more individuals. Organizations are structured differently and research into organizational design has been preoccupied with the need to discover what kinds of organizational designs and structures would be most effective in different situations. Organizational design can be defined as the integration of people with core business processes, technology and systems. A well-designed organization ensures that the form of the organization matches its purpose or strategy, meets the challenges posed by business realities and significantly increases the likelihood that the collective efforts of people will be successful (Allen, 2012). It is also defined as the structures of accountability and responsibility used to develop and implement strategies, and the human resource practices and information and business processes that activate those structures (Greenwood & Miller, 2010). Depending on the function of the organization and the environment or context in which it operates, the technologies available, and the interdependencies operating within an organization, the effectiveness of organizations may vary. The structure of an organization can also be defined simply as the sum total of the ways in which it divides its labor into distinct tasks and then achieves coordination among them (Mintzberg, 1979).Central research questions in design have, therefore, been geared towards identifying variables that would enable consistent and valid predictions of what kinds of organizational structures would be most effective in different situations (Tushman & Nadler, 1978).

According to (Levchuk, Levchuk, Luo, Pattipati, Kleinman, 2002), the optimal organizational design problem is one of finding both the optimal organizational structure (e.g., decision hierarchy, allocation of resources and functions to humans, communication structure, etc.) and strategy (allocation of tasks to decision-makers, scheduling task execution, detailing decision policies, etc.) that allow the organization to achieve superior performance, while conducting a specific mission. There are therefore different structures of organizational design and these are ways of directing key ideas and the differences in design have consequences for performance, power, decision-making, conflict, morale, and job satisfaction. Design drives the way strategies are formulated or formed and determines whether and how they can be implemented. It is the vehicle by which firms recognize the need for adaptation, determine its course, and put change into effect, and is the framework that enables and allows collective behavior to occur (Greenwood & Miller, 2010).

**Functional and Divisional** – This is structured around the tasks required and whose inputs are functions or specialties as marketing, finance, engineering, procurement, production, research and development, human resources. The divisional form is structured according to the outputs generated or products delivered such as services, programs and projects, markets, clients and geographical locations. The functional design is more centralized and the divisional more decentralized. Because of the specializations, the functional design pushes decision making to the top management where the inputs required for a final decision converge. For the divisional design, the division manager can resolve many decisions and avoid a fall back on top management for all decisions. Functional forms are found more in organizations that have single or dominant products while divisional forms are found in organizations with more diversified products but, they retain a central research and development function.

**Matrix** – A matrix design is structured around job functions where an employee or worker has two or more bosses. A matrix organization requires properly designed managerial support systems and a sensitization of the people on the matrix environment. The success of matrix organizations hinges on: adoption of a multidimensional reporting system; establishment of a reward structure; development of career paths based on multifunctional, multi-business and multi-country experiences and a top management that must balance the views emerging from different dimensions and act in a more participative manner, develop a judgement for priorities and be prepared to arbitrate conflicting situation (Hax and Majluf, 2001). Communication and knowledge management are key aspects of a matrix organization and creating an environment of trust and confidence among the people in the organization.

**Hybrid** – most organizations do not take on purely one or other organization design but a mix of them thus establishing a hybrid model of organization design. The challenge is to seek a balance between different models. Divisional organizations retain some centralized functions while functional organizations establish independent subsidiaries to add some autonomy to some segments of its business. Most of the new approaches to innovation involve ways of obtaining technology from outside the firm, as an alternative to internal R&D. In the U.S., the great majority of biotechnology alliances have linked small, technology-driven, emerging companies with large, well-established companies with extensive manufacturing and marketing capabilities. In Europe, because significant venture capital for startup companies is lacking, there is greater emphasis on, and government support for, industry-university collaborations and collective research efforts by teams of large companies (Powell, 1987). To adapt to the changing technologies, organizations take on hybrid models to develop the flexibility and creativity that is brought on by changing technology, as rigid organizational designs would make it more difficult to adapt to the environment. However, these models are highly negotiated as each organization has a high stake in the running of other organizations and due diligence becomes paramount in developing hybrid models.

1. **Discuss the goals of project management and explain the methods of project selection**

Project management is an efficient tool to handle novel or complex activities. According to Munns and Bjeirmi, (1996), it is more efficient than traditional methods of management, such as the practice of functional divisions in a formal hierarchical organization, for handling such situations. Project management has three key goals: to control time, cost and scope of a project. Utilising the existing organisational structures and resources, it seeks to manage the project by applying a collection of tools and techniques, without adversely disturbing the routine operation of the company. The function of project management includes defining the requirement of work, establishing the extent of it, allocating the resources required, planning the execution of the project, monitoring progress and adjusting deviations from the plan.

**The analytic network process (ANP)** - R&D projects are multidimensional in nature and have risky outcomes. R&D projects are often committed to long term activities, result in uncertain outcomes, are cost intensive, and in many cases, demand special project management. the success of many projects depends on the buy-in and cooperation of these functions. Omitting them from the decision process can have detrimental organizational effects. Including them, however, increases the complexity and difficulty, as sometimes conflicting agendas and objectives must somehow be resolved. Other factors complicate the decision process. Often, especially in portfolio selection situations, different projects with different impacts must be compared. There may also be overlaps, synergies, and other interactions of the projects that must be considered. R&D projects are often initiated and championed in a bottom-up manner, where engineers or scientists may advocate projects that have great technical merit. However, financial or strategic benefits of the technology may be left out of considered (Meade and Presley, 2002).

**Scoring** - Scoring is appropriate when there is a low degree of interdependence between projects, that is, when the activities and results of one project do not depend on the activities and results of a different project. The most common approach is to rate potential projects against a set of criteria and then to obtain a figure of merit for each proposal by combining the results of the ratings using some type of algorithm. The criteria can be weighted to emphasize the importance of some criteria over others. The alternatives are then ranked using the results of the algorithm to facilitate decisions regarding resources. It is quantitative enough to possess a certain degree of rigor, yet not so complex as to mystify and hence discourage potential users. Scoring can accommodate nonquantitative criteria into the selection process by relating question responses to a constructed, ordinal scale. Scoring can incorporate peer review into the selection process if the evaluators chosen are peers of the proposing researchers. Scoring does not require detailed economic data, some of which may not readily be available. Furthermore, scoring tools can be customized by an organization to articulate the characteristics it wishes to emphasize (Henriksen and Traynor, 1999).

The Agriculture and Food Security program at IDRC runs competitive calls to select projects. To do so, it employs an evaluation grid as the below example that is adjusted for criteria from time to time depending on the context.



The projects go through a selection process by different teams and experts based on an evaluation grid that lays out the criteria and scores and the weighted scores and the comments from reviewers that guide the selection of projects. Although often times, the highest scoring projects get a pass through to funding, it is not necessarily that the highest scoring project gets funded; the projects must also align to the strategic objectives of the organization and present some innovative technologies, methodologies or systems that can be applied in the agricultural sector, rather than the same tested and tried methods that have been in place in the same area over time. The scoring lends rigour and consistency to the process and is used as a basis of comparison to reach a consensus on which projects should be funded.

**Cost benefit analysis**: Net Present Value (NPV), Internal Rate of Return (IRR), Return on Investment (ROI) - utilize the concept of the expected present value (PV) of future profits attributable to projects as a basis for making such decisions. common assumption of such models is that the total PV of a group, or portfolio, of projects can be obtained by summing the PVs of projects in the portfolio. In this case, the projects may be said to have independent PVs and the resulting model may be referred to as an "additive" model. Many aid agencies conduct an economic analysis and calculate the internal economic rate of return (IRR) to determine whether the proposed project can be expected to achieve some minimum acceptable IRR on the resources invested.

**Risk and sensitivity analysis** - This is the calculating procedure used for prediction of effect of changes of input data on output results. This procedure is often used with project evaluation under conditions of uncertainty. The basic purpose is not only to get an insight into the impact of changes of different parameters on changes of certain criteria values, but to understand the impact of such changes on the total evaluation of a certain project (Jovanovic, 1999). Another goal is to define steps and actions of purposeful influence to be exerted on certain factors to avoid possible unwanted changes of some input values and of investment project evaluation. It therefore looks at the possible risks and finds mitigation points to avoid changes that would arise from the occurrence of those risks that would negatively impact the project.

1. **Using examples explain the following**

**Project evaluation** - Every project has goals and objectives, outputs and outcomes that are set out at the conceptualization and planning and design phases of the project. There are targets set against benchmarks and baselines, quality that has been defined and budgets and scope against a certain timeline. To ascertain whether a project is meeting its targets, is on course, on schedule, on budget, whether risks have been considered, whether the outcomes set will be met or have been met, there needs to be built into the project an evaluation. An evaluation is an assessment, at certain defined times of the project and at the end of the project. More emphasis is being placed on monitoring and evaluation (M/E) and the extent to which development projects are cost-effective and achieve their intended objectives, and can be conducted at project, sectoral, or national levels. According to Westat (2002), evaluations should be conducted for action-related reasons, and the information provided should facilitate deciding a course of action. Evaluation systems should provide the information that project planners, implementers, and managers need at each of these stages and should help determine whether a project has been implemented as planned, what problems need to be resolved, what expected or unexpected impacts have occurred, and what lessons can be learned for the selection and design of future projects. An evaluation process therefore provides information to help improve a project and improve the design and implementation of future projects.

The Cultivate Africa’s Future program phase 1 was a 4-year program funded by the Australian Centre for International Agricultural Research and Canada’s International Development Research Centre. It was a $15 million-dollar fund to fund agricultural programs in 10 Eastern and Southern Africa countries. While program officers monitor the projects through site visits and reporting mechanisms throughout the life of the projects, built into the fund was an external evaluation at the 2.5-year mark that would determine whether the fund was meeting its objectives of developing innovations, methodologies and technologies in the areas of post-harvest loss, water management, nutrition and access to markets. This evaluation would also determine whether the fund would go into a second phase given the outcome and findings of the evaluators. The external evaluators went through the knowledge management system to find all the documentation pertaining to the fund from the call for concept notes, proposals, scoring grids, evaluation by the scientific advisory committee, funding agreements, technical reports, project updates and meeting minutes to understand the rationale of the fund, the objectives and the goals that would enable them to make an assessment of the fund.

Out of the evaluation, it was noted that the fund had made good progress in meeting its objectives, given the competitive nature of the call, it had 5 of the 10 countries that had been targeted, had gender and communication well integrated, trained the project teams well and kept to the reporting guidelines. However, it was found that 30 months were insufficient for agricultural projects to meet all their objectives and all projects would need an extension, some of the high performing projects could be rolled over into phase 2 for them to have a greater reach, the environmental impact assessment should have had more attention. Following from this, it was deemed to have been a positive evaluation and the fund went into a phase 2 with critical lessons to take from phase 1 such as having a longer funding period for projects to 42 months rather than 30 and building a more intensive and rigorous environmental impact assessment.

**Auditing**

Audits stimulate the exchange of experiences in strategic learning without disregarding the specific role of other players (Hobday 2000) who bring the acquired knowledge to others after reaching maturity, thereby possibly minimizing the costs and risks involved in similar situations. Audit gets its importance because it is directed towards the performance, efficiency, thrift and productivity of public administration organs, and it covers not only specific aspects of administration, but also managerial activity, which includes organizational and managerial systems (Hossain, 2010). For instance, many construction projects, both publicly and privately funded, require that a project audit be performed by an independent party. The audit, according to Nalewaik (2007), not only tests the accuracy of invoices and other charges incurred against a project but may include a review of processes used in project management and project cost/schedule controls, and a comparison of those processes to industry best practices. Thus, the audit function is an essential project controls tool. Performance audits may include functional audits for economy and efficiency, evaluating the planning process, space use, staffing, and established procedures, while a financial audit is an examination of financial statements and records, to provide reasonable assurance that the data is accurate and complete. Audits can be undertaken by an inhouse auditor or an external auditor as the case may call for.

The International Development Research Centre has an internal audit office that covers risk and audit functions. The audits are carried out on a rolling basis covering different programs at different times. The auditors also visit the regional offices to ensure the information they are getting is accurate. They comb through the projects to ensure the processes and procedures laid out in terms of how projects should be funded, how grant agreements are drafted, how payments are made, the documentation available for procurement, the types of products procured, the capture of financial and project information in the different systems, and the approval processes followed are as per the policies laid out for the organization. They also identify the gaps and the risks that accrue from certain processes and procedures to find ways to simplify procedures and mitigate risks.

**Termination** – Every project has a defined start and finish date; termination is, therefore, inevitable and is the fourth process in the project life cycle. How a project is terminated and when may have a bigger impact on future projects and project teams. Organizations have the options of developing projects that align with their short-term or longer-term strategy. They could opt for higher risk projects that may yield a greater reward from the impact achieved. However, those high-risk projects may turn out to be unsuccessful given the degree of risk or indeed turn out to be successful. Lower risk projects can also turn out to be unsuccessful and be terminated before their end date because perhaps the project manager selected was not appropriate, the team could not work well together, extenuating circumstances intervened to make the project impossible, the technology moved ahead and there was no further need to develop a particular software, or a project came to the full conclusion and entered the termination phase. Thus, termination can be for several reasons and each reason is an opportunity to learn and influence the design and planning of subsequent projects. Hormozi, McMinn and Nzeogwu, (2000) posit that organizing a project’s termination process is especially important when it has failed, because of the lasting impact on future projects as well as the organization’s image.

Termination, in a case where a project or program fails can be costly, not just in terms of finance but also reputation. The Airbus A380 aircraft was a competitive response to Boeing 747 aircraft. Airbus announced a shutdown of the A380 program due to weak sales, eliminating a model at the heart of a record trade dispute between the European Union and United States over government support for Airbus and its U.S. rival Boeing. The world's largest airliner, had two decks of spacious cabins, and room for 544 people in standard layout, was designed to challenge the 747. This failed to take hold as airlines backed a new generation of smaller, more nimble jets. More importantly, however according to Reuters (2019), was that Emirates - the largest A380 customer - reduced its orders for the A380 after an engine dispute and a broader fleet review, opting instead to order the smaller A350 and A330neo instead. Without the anticipated level of demand, Airbus assembly lines would have dried up. The Airbus Chief Executive Officer, Tom Enders, argued that Airbus could no longer run after illusions and the aircraft maker had to take the only sensible decision and stop this program. This termination rolls back years of innovation, resources spent, both human and financial. More importantly, it calls into question the Airbus model in terms of how it conducted its research on the aircraft industry, collected the requirements and understood what its clients in the airline industry wanted in terms of types of aircrafts, and its projections of sales and identification of risks or reliance on a singular client to drive the sales of the aircraft. The manufacturer got caught in a changing tide of airline travel where most airlines were also retiring the B747s and replacing them with the new, smaller, light weight, fuel efficient and long-range aircrafts. The failure to recognize these changes put A380 at a disadvantage and termination could be the only way to save the company from accumulating needless costs to keep the aircraft in the skies.

1. **What is expected of a project leader?**

A project is a temporary endeavor that has a definite start and end date. Within this period, there is a team, and objectives and goals to be met. To achieve these, every project needs a ‘driver’ who brings the team together and can plan effectively to meet the desired end. This role is played by a project leader. Leadership style and competence are key success factors and different project leadership styles can be applied at different stages of the project life cycle. The project manager has a leadership role in creating an effective working environment for the project team. A project is usually led by a project manager who oversees the various parts that form a project. Although there are other players in projects, the project manager is the principal leader of the project. The leadership role is crucial to facilitating various project success factors that contribute to project performance. A good project leader is required to assign appropriate importance to relationships, communicate their values, and at the same time pay suitable importance to processes (Anantatmula, 2010). A project leader is also expected to provide vision and have an ability to cope with change. Providing clarity in project mission is another key expectation of the project manager as the leader of a project to promote teamwork and collaborative effort. Trust, creating transparency of decision making, creating consistent processes, ensuring understanding of expectations, and delivering results are key success factors of a project and a good project leader should foster these attributes and be able to manage conflicts and problems in projects.

1. **Discuss in detail the attributes of a project leader**

**Effective communicator** - Defining project goals and likely project outcomes clearly and early in the project is critical. A project leader should have the capacity to define project outcomes and establish what is expected from all the stakeholders to eliminate perceived and actual incidences of not delivering expected results. This is specifically true with stakeholders within and outside the project who are not routinely involved with projects. Similarly, a project leader should be able to communicate the outcomes and goals of a project to the project team and provide clarity in the project mission to promote teamwork and collaborative effort.

**Good planner** - At the outset, a good leader must be able to define roles and responsibilities of project team members without ambiguity to improve performance and manage conflicts. This practice would lead to effective use of the project team members and help functional departments extend their support.

**Charismatic** – A good leader must be able to establish trust. An environment of trust is influenced by the organizational culture which promotes transparency and openness in their communications. Trust among the project team members to work cohesively would lead to knowledge sharing and collaboration. The leader must also be able to facilitate support of top management which would translate into willingness of everyone in the organization to support the project regardless of the challenge of obtaining support in traditional organizations where functional managers control resources.

**Engaging** - A project leader must adopt a leadership style based on empowerment and involvement in highly transformational context, that is focused on producing radical change through engagement and commitment. One should also be involving where organizations face significant, but not necessarily radical change in their way of work.

**Goal oriented** – Being goal oriented gets the job done. It keeps the leader focused on the delivery of clearly understood results in a relatively stable context. A project leader must anticipate changes and find fixes to challenges to meet the goals set out for the project, all the while keeping the project team and other stakeholders appraised of the situation and on board with the project despite setbacks from time to time.

1. **With the help of the risks and mitigants pyramid explain project financing**

Project financing, can be defined as a special form of financing projects in which the assets and liabilities of investors, not related to the project, are legally separated from the project, while the return on capital is assured, not with assets of the borrower, but by the project future cash flows (Ganbat, Popova, & Potravnyy, 2016). Financing a project carries with it certain risks, whether an organization finances a project from its own reserves or borrows or enters into an agreement with other funders. This cuts across infrastructure, aircraft manufacturing, software, pharmaceuticals, agriculture, banking, telecommunications or any other field. A project dealing across geographical regions, dealing with various suppliers, products, political environment, different currencies, type of industry, rules and regulations, takes on risks just by the nature of the projects and the realities prevailing. Some projects are too large to be funded by one financier who would take up all the risks. For instance, governments cannot fund infrastructure projects, power and energy projects in their entirety and neither can private sector. For these large projects, there must be, built into them a way to minimise and apportion risk among different entities. It is estimated that total project-financed investment grew at a compound annual rate of almost 20% through most of the 1990s and peaked at $217 billion in 2001. In the USA, approximately 10–15% of total capital investment is financed on a project basis, and over half of the capital assets costing more than $500 million are financed on a project basis. The most common applications for financing have been in the natural resource (mines, pipelines, and oil fields) and infrastructure (toll roads, bridges, telecommunications systems, and power plants) sectors (Esty, 2004).

Project finance is essentially the establishment of a legally independent project company financed with equity from one or more sponsoring firms and non-recourse debt for investing in a capital asset. Nonrecourse debt is where lenders are repaid only from the cash flow generated by the project, or, from the value of the project’s assets in case of failure. Project financing has therefore evolved into primarily a vehicle for assembling a consortium of investors, lenders and other participants to undertake projects that would be too large for individual investors to underwrite. By segregating risky assets in a project company, managers can prevent a failing project from dragging the parent firm into default. The pyramid below is a checklist of risks that could confound project finance, the severity of which is dependent on the project.

Figure : risks and mitigants pyramid. Module 7 notes. Princeton Pacific Group

The risks are also not independent of each other or occur in isolation but have interdependencies that could exist across categories of risk. For instance, for competition risk, it could encompass a country risk if competition laws are not in place, market risk if there is no regulation of the market, industry risk should there be no structures governing the industry, instability in the country that could cause currency fluctuation thereby raising the cost of the project and impact the supply of materials needed for the project, or environmental occurrences that could cause floods and droughts that in turn cause stresses on a country’s economy and shift of priorities. One risk could have a boomerang effect on a myriad of other factors that could complicate the project. Similarly, mitigation factors could arise from several factors; country stability and functional systems; regulations and laws that govern industries; possibility of insurance to cover liabilities; competition and markets that are not distorted by counterfeits, prices of inputs, and quality of products; stable currency; and availability of technology and human resource capacity. Esty (2004) argues that project finance allows the firm to isolate asset risk in a separate entity where it has limited ability to inflict collateral damage on the sponsoring firm so despite the occurrence of risk, the parent firm has a hedge around its assets.

1. **What are the sources for finance for a project, discuss each in detail**

**Project sponsors or owners** – projects are initiated by someone or an organization, to meet a certain objective or strategic direction. The initiators of the project become the sponsors of a project as they have the strategic direction and objectives that the project needs to meet. The sponsors are, generally, the project owners with an equity stake in the project. Comer (2001) asserts that it is possible for a single company or for a consortium to sponsor a project and the ultimate accountability for the realization of benefits lies with the Project Sponsor. Project sponsorship is a senior management role with responsibility for identifying the business need, problem or opportunity with a focus on ensuring that the project remains a viable proposition and that the benefits of a project are realized (Denise, 2017).

Typical sponsors include foreign multinationals, local companies, contractors, operators, suppliers or other participants. The World Bank estimates that the equity stake of sponsors is typically about 30 percent of project costs. More than just finance, the project sponsors also have a role in the governance and accountability structures for the project and require consistent updates as major stakeholders on, not just the cost implications of the project, but on the changes, the progress, the schedules, and activities that have an impact on the attainment of the objectives. However, sponsors are not involved in the day to day running of projects like front-line employees and are not as well positioned as mid-level managers to manage change efforts. They are however key stakeholders who hold the purse strings and need communication and feedback channels open and available to them on the status of the project.

**Commercial banks** - Banks are a primary source of project finance. Research shows that in 2001, the number of projects financed with bank debt were 314, with an average loan size of $345 million; 79 projects were financed with bonds with an average issue size of $316 million. Projects remained concentrated in power (44%), telecoms 22% and infrastructure 10% representing more than three-quarter of the total market in 2001 (Esty & Christov, 2002). Banks often form syndicates to sell-down their interests. Syndicated loans are common for the debt-financing of larger projects, as they allow the diversification of the large risks of a single project across a group of banks. They also have expertise in loan monitoring on a month-to-month basis, and flexibility to renegotiate loans. Bank loans, principally in the form of floating rate loans, are priced off a particular benchmark, such as the US treasuries or LIBOR, and account for the bulk of debt financing (Dailami & Leipziger, 1998). Project financing for banks is long-term lending to finance investment projects and the main source of repayment of loan principal is the cash flow that is generated by the project in the future, after the successful completion of project investment phase or after the successful market entry (Ganbat, Popova & Potravnyy, 2016).

**Capital markets** - In a market economy, one of the functions of capital markets is to be a source of financing investment. Recent developments in banking and finance regulations, along with a decline in banks’ economic determinants in the wake of the financial crises, have made capital markets an increasingly important source of funding in project finance, as banks have had to reduce their overall level of lending, especially for long term and illiquid investments. Major investment banks have recently completed several capital market issues for international infrastructure projects. The capital market route can be cheaper and quicker than arranging a bank loan. In addition, the credit agreement under a capital market is often less restrictive than that of a bank loan. Furthermore, these financings might be for longer periods than commercial bank lending; might offer fixed interest rates; and can access wider pool of available capital and investors such as pension funds (Comer, 2001).

Given the underdeveloped state of local bond markets in emerging market economies, infrastructure projects especially have had to tap international financial markets for long-term finance. Compared to the size and depth of local equity markets, debt markets are much smaller, less liquid, and have a narrower investor base. Typically, the bulk of transactions are centered on government papers, and corporate issues tend to be of short maturity, perhaps five to seven years. Estimates put the total size of Asian local markets at about US$477 billion compared to US$7429 billion in the United States and US$366 billion in the United Kingdom (Dailami & Leipziger, 1998). This financing is provided by numerous investors, and coordination difficulties are assumed to make it impossible to renegotiate any debt contracts.

**Multilateral agencies and Development Banks** - Multilateral Development Banks have a special role in assisting private enterprises undertake financially viable projects with significant economic and social merit, and therefore achieve positive development impact (Griffith-Jones & Fuzzo de Lima, 2004). Multilaterals are in a unique position to assist in mobilizing international private capital in emerging markets, but in many cases also in advanced economies, the role of development banks in facilitating infrastructure deals, especially, is crucial. Several new facilities are being established, such as the Africa50 Infrastructure Fund with support from the African Development Bank, the ASEAN infrastructure fund with support from the Asian Development Bank, or the Asian Infrastructure Investment Bank at the initiative of China. As development banks bring vast expertise and in many cases insurance against political risks to the table, their loan commitments are in some cases a pre-condition for private lenders to make their funding available. In some emerging markets, development banks also serve a key role as the credible auditor of projects. Recent policy initiatives by the G20 aim to increase the efficiency and size of project preparation funds to improve the capacity of multilateral development banks to develop bankable Public Private Partnerships’ projects, but also to increase the attractiveness to alternative sources of capital, particularly from private investors (Ehlers, 2014). In the 1990s, multilateral banks accounted for roughly 17 percent of developing country debt while Export Credit Agencies accounted for 31 percent (Esty, 2004).

It is now common practice that multilaterals directly support private enterprises, private equity funds, and financial institutions. Their traditional modes of financing are equity investments and hard currency loans. There are several credit enhancement products to facilitate co-financing. The projects may involve various forms of risk-sharing and ownership arrangements including build-own-operate (BOO) and build-operate-transfer (BOT) structures. For example, Asian Development Bank (ADB) executed a bond issue in the Indian domestic capital market and raised Indian Rupees 5,000 million (10 years fixed rate) for ADB’s private sector infrastructure investments in India. An example of cooperation among multilaterals in terms of providing more comprehensive and effective financial structures to finance infrastructure is the Public-Private Infrastructure Advisory Facility (PPIAF), a multi-donor facility, which assists Governments to promote private sector involvement in infrastructure (Griffith-Jones & Fuzzo de Lima, 2004).

**International Financial Institutions** – Development Finance Institutions (DFI) try to spur economic development while Export Credit Agencies (ECA) help domestic firms export their goods and services to international markets. According to data from the International Finance Corporation (IFC), the two types of institutions invested $24.7 billion in private sector projects around the world in 1998. Of this amount, medium to long-term loans and equity accounted for an estimated $19 billion while guarantees and insurance products accounted for the remaining $6 billion. ECA finance and cover is becoming more attractive to sponsors looking at diversifying their reliance on conventional debt finance. It had previously been considered as an expensive option that was not needed because of the liquidity in the conventional bank debt market. The position has now changed. The primary reason for this is that the conventional bank debt market is now not always able to respond to the total debt financing requirements for some projects, or if they are, they can do so only at pricing that makes the inclusion of ECA facilities within a financing package a better financing solution for the sponsors.

In Emerging Asia, ECAs tend to have become more involved in large infrastructure projects. For instance, the Japan Bank for International Cooperation and the Korea Export-Import Bank are large players. In Africa, the China Development Bank (CDB) has become a major player in the infrastructure market. ECAs usually demand that materials, machines and sometimes even labour for infrastructure projects are bought from their home jurisdictions. While this can potentially raise costs, ECAs often allow repayment of debt in local currency, at least in part. ECAs are also seen as a potential insurer against political risks and hence help to reassure other lenders (Ehlers, 2014).

1. **What is the importance of looking at the sources of finance for a project**

Project finance can raise larger amounts of long-term, foreign equity and debt capital for a project and protects the project sponsor’s balance sheet but is a costly process. Through proper risk allocation, a sponsor can undertake a project with more risk than they are willing to underwrite independently. It applies strong discipline to the contracting process and operations through proper risk allocation and private sector participation. The process also applies tough scrutiny on capital investment decisions. By involving numerous international players including the multilateral institutions, it can provide a kind of political insurance. It is the role of the project finance advisor, the project sponsor and other participants to structure the financing in such a manner that mitigates these risks. Lenders and investors are always initially concerned about financing immobile assets in distant, politically-risky areas of the world. The project finance advisor’s role is to carve out the risks, assigning them to the party who is best suited to be responsible for controlling them. Every source of finance has its advantages and disadvantages and depending on the project at hand, not all sources are suitable for all types of projects. Infrastructure is different from health, agriculture, education, or software and therefore lumping them together under the same project finance model that has a fixed tenor can be detrimental to the project. There has to be a right fit for the project at hand.

1. **With the aid of the project finance structure discuss the various participants and their relevance**

Projects comprise a diverse range of players, especially mega projects like infrastructure. They bring together a conglomeration of different actors who play different roles in the project and where the absence of one player could lead to failure of a project. Whereas the objectives and goals of each project may be different, the structure of financing of large projects follow, basically, similar structures that Thomas H. Pyle, Managing Director of the Princeton Pacific Group refers to as “the project finance angel” - the halo of the angel is the government; the project sponsor is the head; the contractor and operator serve as wings; the project company is the body; the supplier and customer represent the arms; and, the banks are the angel’s feet. Each is critical to the success of a project.

**The halo - Government** – Government is a critical cog in project finance, whether it is providing any financing or not, and plays a role mainly as a facilitator. Project teams need and use information about governments' policies, strategies, and political stability, that have an impact on project parameters and benchmarks such as tariff rates, prices, and cost of capital. Guarantees are the most important form of government support to private infrastructure projects. They are intended to mitigate risks faced by creditors and project promoters, ranging from the commercial risk of non-payment of government entities, to policy and regulatory risks. Guarantees have been particularly prominent in power projects in developing countries. Governments have relied on a range of explicit guarantees, comfort letters, and other forms of insurance, encompassing a broad range of characteristics in the extent of coverage provided, types of events guaranteed, the nature of the underlying risk, and whether such guarantees are explicitly incorporated in contractual arrangements or are implicit, with no contractual basis defining the government's liability.

**Project Sponsor** - Despite the general acceptance of a project sponsor role in the management of projects, the actual role and responsibilities of the project sponsor are often unclear and in fact differ considerably across organisations (Crawford & Brett, 2001). the individual or group within the performing organisation who provides the financial resources, in cash or in kind, for the project and one responsible for ensuring that the project is successful at the business or institutional level. The sponsor has an equity stake in the project thereby being a key stakeholder in the governance structure of the project.

**Contractor and Operator** – Building a bridge, a road or a railway requires someone to dredge, lay tracks, put switches and essentially construct the infrastructure. According to Comer (2011), the contractor is the person or company that constructs the project to the technical specifications outlined in the contract with the project company without which there is no project. A contractor can sub-contract out a section of the work to be done to another company that has the expertise required. The operator, on the other hand, is responsible for maintaining the quality of the project’s assets and operating the power plant, pipeline, etc. at maximum efficiency. For Instance, for the Standard Gauge Railway in Kenya, the contractor building the railway is China Roads and Bridges, while the operator, responsible for maintaining the system is Kenya Railways although with an understanding that CRBS would ensure that the railway operates as it should for a period before a complete handover to Kenya Railways.

**Project Company** – Project finance involves a corporate sponsor investing in and owning a single purpose, industrial asset through a legally-independent entity financed with non-recourse debt (Esty & Christov, 2001). These legally independent entities are project companies or Special Purpose Vehicles (SPV) that protect the parent company’s assets while undertaking large projects like infrastructure projects that require nonrecourse or limited recourse finance. Controlled by project sponsors, a project company is the center of the project through its contractual arrangements with operators, contractors, suppliers and customers (Comer, 2011).

**Supplier and Customer** – Every project needs inputs. For instance, an aircraft needs engines, wings, fuselage, rivets, sanitation facilities, stabilizers, landing gear – all need to come from companies that manufacture these different parts if an airline company itself does not have the capacity to manufacture those parts on itself. Thus, the suppliers provide the inputs needed to bring the project together and without whom, there is no product. The customer, is the consumer of the products of the projects be it a company like Kenya Airways (KQ) that requires aircrafts with certain specifications for certain routes of classes within the aircraft. Every product manufactured has a customer base in mind or there would be no point in manufacturing a product, building infrastructure or aircrafts if there is no customer base.

**Banks** – these are primary sources of credit, capital, finance for projects. Comer (2011) posits that though commercial banks are not generally very comfortable with taking long term project finance risk in emerging markets, they are very comfortable with financing projects through the construction period. A project might be better served by having commercial banks finance the construction phase because banks have expertise in loan monitoring on a month-to-month basis, and because the bank group has the flexibility to renegotiate the construction loan. The most active sectors for bank lending between 1995 and 2000 were: power in the Americas ($496.8 billion), telecom in Europe/Middle East/Africa ($69.7 billion), telecom in the Americas ($431.5 billion), power in Asia Pacific ($23 billion), oil and gas in the Americas ($18.6 billion), and oil and gas in Europe/Middle East/Africa ($16.7 billion) accounting for 78% of all bank lending (Esty & Christov, 2001).

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