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

**MODULE 6 – RISK MANAGEMENT IN PROJECTS & PROGRAMMES**

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1. **Discuss the methods available in budgeting for the project**

A budget is a plan for a given period of time in future expressed in financial or physical units and includes all the funds authorized to execute the project. It is a quantitative expression of a plan and varies in scope depending on the organization. There is usually a master budget, within which are subsidiary budgets such as the production budget, marketing, raw material, capital expenditure and labour. Budgets facilitate the comparison of actual results with the estimated costs by providing benchmarks against which performance can be measured. Dearden, Jones & Sartorius (2002) posit that the project budget, which is the final result of the planning cycle, must be reasonable, attainable, and based on contractually negotiated costs and the statement of work. The basis for the budget could either be historical cost, best estimates, or industrial engineering standards.

The initial project budgets must be derived from the cost estimates used when a tender or internal project proposal were prepared. These denote the authorized level of expenditure for all departments engaged on the project. Ideally the departmental managers, should have had prior opportunity to approve the estimates and accept commitment to them. The total project budget should be distributed over the project work breakdown structure so that there is a specified budget for each work package and, within those work packages, a budget for each task. Each of these budget elements must have a unique cost code against which human resource timesheet data, material costs and all other direct expenses can be collected and accumulated.

**Cost estimates**

A research report focusing on the failure of software projects highlighted in a survey where almost one third of sampled projects experienced cost overruns of 150–200%, with an average overrun of 189% of the original cost estimate. Over one third also experienced time overruns of 200–300%, with an average overrun of 222% of the original time estimate. Similarly, there is a strong consensus among construction industry professionals that the traditional cost estimation approach does not work (Doloi, 2010).

Cost estimates are necessary for all projects. They are essential for funding and budgeting, for establishing resource requirements and for cost control. Project cost estimates should be coded and tabulated to conform to the work breakdown structure. This is essential as part of the cost reporting and control functions and gives a basis of comparison between the estimates and the actual costs incurred, on an item by item basis. Over time, records of estimates and corresponding costs can be used in comparative estimating for future projects, if all estimating and cost data are held in files structured to a coding system. One estimating subset can be allocated to each main project work package or group of tasks then rolled up to give the estimated net total project cost. However, even when cost estimates are done correctly, the senior management may determine that the costs are too high resulting in cost reductions without a corresponding reduction of the project scope which may impact negatively on the project.

**Analogue and Parametric models** – At the initial or feasibility stages of a project, reliable cost estimation is required within a very limited time period when it is not possible to generate detailed design or budget of a project (Gunduz, Ugur & Ozturk, 2011). Since planning stages can be too time consuming, other fast and accurate methods are required to estimate the cost of various items and develop an overall budget for a project. Parametric cost estimating is an approach that is mainly used for contract bidding, input into a cost benefit analysis, or a pre-planning tool for project implementation. It includes historical data currently in use as well as new data specific to a new project. According to Kwak & Watson (2005), the use of parametric estimating in budgeting, scheduling, and control of projects enhances the ability of project management organizations to effectively and efficiently utilize valuable resources. The benefit of parametric budgeting is that it better determines potential resource requirements during the project pre-planning and conceptual phase. It may lack precision because all requirements and costs are not known to the exact detail but it plays a significant role in estimating the cost of a project while developing a budget. A parametric estimation is obtained by using Cost Estimating Relationships (CER) among the project characteristics and applying an algorithm to determine an approximation of the total project cost. It is a methodology associated with an organization’s strategic approach to project management and requires less information concerning labor and material than that of a detailed estimate (Kwak & Watson, 2005).

**Monte Carlo or stochastic budget simulation** – Projects are derived and undertaken in complex environments whether they are manufacturing, development, software or health projects. Every field has its own challenges and makes budgeting a very complex and arduous process. There are constantly moving parts at the earlier stages and even at the implementation stage of a project; assumptions are challenged, definitions change, the environment changes, all which can impact the cost of the project in either positive or negative ways. At the proposal stage the design of the project and the demands it will bring are still relatively unclear and costs are uncertain. The assessment of cost items and generic risks in the budget encompasses levels of uncertainty. Therefore, Elkjaer (2000) argues that Monte Carlo simulation is perhaps the most easily usable form of probability analysis at the proposal stage, as it considers uncertainties and uses probabilistic range estimation rather than single point estimation, therefore reflecting the fact that outcomes vary.

Given the uncertainties that exist at the proposal or feasibility stages, the Monte-Carlo method requires an explicit assessment of uncertainty to evaluate the total cost. This is an integral part of assessing each cost item and is based on a triple estimate, using intuitive and subjective judgement to quantify an uncertain value and estimate the range of each item in the budget. Using a triple estimate for uncertainty analysis provides planners with an opportunity to quantify the uncertainties involved for the different project items.

1. **What are the roles of the multi-disciplinary teams in planning and budgeting for a project?**

The mechanisms by which projects are funded can act as a catalyst or barrier to action. A project involves various disciplines: finance, IT, human resources, technical teams, and various departments. To successfully plan a project, a project manager has to consider all these various components and the expertise that needs to be pulled for various projects in order to make them successful. Therefore, it would be prudent that a planning and budgeting process include a cross section of the various disciplines found in an organization. The respective budget required for each resource may differ depending on the expertise, the availability of the resources (human, financial and technical), and the other projects being undertaken by the same resources may impact on the timelines of a project. A multi-disciplinary team therefore has a number of different professional groups to bring different perspectives in the planning and budget process of a project.

A project manager’s role is to pull information together and strategically chart a way forward and this cannot happen without drawing on different groups of people in the organization or a project. If for instance an organization wants to launch a vaccine project, it would need to consider a team made up of a cross section of disciplines; epidemiology, economics, anthropology, finance, and other groups. Each of these would bring their own expertise into the project planning and budgeting process to give it a holistic approach. Ratcheva (2008) argues that multidisciplinary teams bring rise to a new way of working that cannot be simply imported in the team, but can only emerge and develop through intense interactions. For instance, Companies are increasingly using forms of multi-disciplinary team working (concurrent engineering, simultaneous development, innovation cells etc). These techniques have been shown to produce a better range of ideas, reduce development time and so costs, and speed the process of bringing better products to the market (Denton, 1997).

Multi-disciplinary teams have a range of perspectives which may assist in error cancellation and the development of the type of active discussion which can promote innovative ideas (Denton, 1997). The selection of teams with a mixed background can promote a wider range of perspectives and active discussion but the team tends to go more slowly through the forming, storming and norming stages. Experience of forming groups appears to help individuals go through the initial forming stages more quickly and become productive sooner. There is more critical thinking via the clarification of ideas and the evaluation of other member's ideas. A multidisciplinary team can enable individuals with a range of knowledge and skills to work together and solve problems or realize opportunities that an individual specialist could not. The project can have a more realistic time, budget and scope as the team deals with realistic scales of projects. Multi-disciplinary teams can simulate the project design more effectively, and give the project manager a better idea of project and how it should be managed.

Brainstorming is a role that multi-disciplinary teams play well. It helps to not only structure the project but work through more realistic budgets. For instance, gender has become an integral component of most donor funded projects. However, more often, the word is placed in the documents but nowhere in the budget is there provision for gender expertise to ensure that project embed gender throughout the activities. Similarly, there is usually no budget line item for communication if a project wants to scale up its operations and needs to engage various audiences through various media channels. A multi-disciplinary team can pick these anomalies out and ensure that the budget is aligned with the goals and intentions of the project right from the planning stage and this mitigates against the risk that certain components may not be carried out because the budget was wanting from the beginning, or prevent the case where the budget has to be realigned when the project has already been rolled out.

1. **Why is risk tracking important?**

Risk tracking is the systematic monitoring of risk performance throughout the life cycle of the project. At the start of every project, there are elements that are known and others that are unknown that can have either a negative or a positive consequence to a project. Of particular concern are those risks that give rise to negative outcomes, increase the budget, cause changes to timelines and schedules and affect the scope of the project. There are those issues where the sponsors or project manager are uncertain about; these could be fluctuations in currency, recessions, droughts and floods, election cycles and resource availability. These constitute what is referred to as risk and can vary in severity. Risk is, therefore, a ‘measure of future uncertainties in achieving program performance goals and objectives within defined cost, schedule and performance constraints.

Risk causes variances to the project and can come at some cost to the project resources, timelines, scope and quality anticipated. Risk does not have to happen but if it does, it can be corrected if it was factored into the project at the planning stage and if the project manager or stakeholders systematically analyze project progress and identify the risks that could affect the project. Wand (2004) posits that there are various ways for categorizing risk for different purposes for example, some categorize risks in construction projects broadly into external risks and internal risks while others classify risk in more detailed categories of political risk, financial risk, market risk, intellectual property risk, social risk, safety risk, etc. In order for risk not to derail a project, it is important to track the type of risk and map out where it may most likely happen in order to find mitigation measures. According to Boehm (1991), it follows then that a good project manager must also be a good risk manager and can use the general concept of risk exposure (potential loss times and the probability of loss) to guide their priorities and actions.

According to Dorofee (1996) tracking is a process in which risk data are acquired, compiled, and reported by those responsible for tracking and mitigating risks and are defined by project personnel during the planning stage. Data are collected and the results compiled and presented in reports that feeds into the Control function of a project. Risk tracking ensures there is a closed loop process by monitoring risk-reduction progress and applying the corrective action needed to keep the risk resolution process on track. Risks have to be documented in a risk register for them to be effectively tracked. This is a living document that gets updated as risks are re-evaluated to reflect that certain risks have been dealt with and completed, or they did not happen, and others that have arisen in the course of the project. Tracking is used to collect accurate, timely, and relevant risk information and to present it in a clear and easily understood manner appropriate to the target audience and the report is used during control to make decisions about managing risks. What is not documented rarely gets addressed as it falls off the radar of those who need to address the risk and find mitigation strategies. If risks are not tracked throughout, it may not be possible to put in place mitigation measures as it would not be clear what aspects need correcting and how to correct them.

1. **Discuss the risk mitigation plan**

Risk mitigation involves the development of risk response action plans to contain and control risks. The idea is to reduce the probability of a risk and/or the impact that an occurrence of the risk may bear, and aims at the implementation of controls that dampen the effects of risk occurrences, while not completely alleviating them (Muehlen and Y. Ho, 2006). Since it is not feasible and practical to develop mitigation and prevention strategies for every risk identified, risk-planning begins with the examination of the costs required to implement each preventive action to contain and manage the identified risks (Tummala, 2011). A documented risk mitigation plan includes the specifics of what should be done, when it should be accomplished, who is responsible, and the funding required to implement the risk mitigation plan. Hallowell and Gambatese (2007), for instance, found that most contractors in construction select safety program elements in an informal fashion with little regard to relative effectiveness. Most contractors were said to rely on intuition and word of mouth when designing site-specific safety programs. This loose evaluation of the risks in construction open up a project to a myriad of unidentified and undocumented risks and therefore a lack of a risk mitigation plan that could turn to be costly in terms of time, resources (human and financial) and that could compromise on the quality of the final product.

A risk mitigation plan consists of five steps: identification, analysis, evaluation, response, and monitoring. One cannot determine a response to a risk that is not identified or for which no provision is given, however vague it may be. A project manager must be able to determine what risks, internal and external to the organization and the project, may occur and have some impact on the project. These can sometimes be derived from historical information, for example, past projects that are similar in nature. Mitigating risk by lessening their impact is a critical component of risk management. If implemented correctly, a successful risk mitigation plan should reduce adverse impacts on a project and as Walewski (2003) states, replace uncertain and volatile events with a more predictable or controlled response. Once the risks to the project are laid out, the risk mitigation plan would serve to perform five key functions:

* Determine what planning, budget, and requirements and contractual changes are needed;
* Provide a coordination vehicle with management and other stakeholders;
* Direct the teams to execute the defined and approved risk mitigation plans;
* Outline the risk reporting requirements for on-going monitoring; and
* Document the change history.

The uncertainty of a risk event as well as the probability of occurrence or potential impact should decrease by selecting the appropriate risk mitigation strategy. Four mitigation strategy categories commonly used are:

1. Avoidance – when a risk is not accepted and other lower risk choices are available from several alternatives;
2. Retention/Acceptance – when a conscious decision is made to accept the consequences should the event occur;
3. Control/Reduction – when a process of continually monitoring and correcting the condition on the project is used. This process involves the development of a risk reduction plan and then tracking the plan. This mitigation strategy is the most common risk management and handling technique;
4. Transfer/Deflect – when the risk is shared with others. Forms of sharing the risk with others include contractual shifting, performance incentives, insurance, warranties, bonds, etc.

The amount of risk-related information that is collected varies from phase to phase of a project and the depth of risk evaluation also differs from one phase to another. In this sense, Han (2008) notes that if the characteristics of all phases of a project are not considered adequately, it is difficult to bring risk mitigation into its full fruition. A Risk mitigation plan is therefore critical if a project is to be successful and deliver the quality on time and within budget as earlier planned.

1. **Discuss in detail the importance of risk management boards**

Risk management is crucial for completion of projects. A risk management board is a tool used to manage risk. Organizations should seek to identify all material risks to their objectives and sub-objectives, design controls and mitigations which produce a residual risk consistent with a target risk appetite, and monitor this entire process, making feedback adjustments as necessary. A risk management board is chartered, it is made up of senior managers, and evaluates all program risks and their root causes, unfavorable event indications, and planned risk mitigations. As an advisory board, it supports the project manager and is a platform for parties to hold discussions and chart a way forward for the project.

The Risk Management Board’s (RMB) task is to take an active role in communicating the information between a strategic division and operations division (heads of department). The RMB communicates information related to policies, strategies and risk management procedures for execution at the operational level and also procures risk management information from heads of departments. Since RMBs only task is to manage risk, it promotes a focused oversight on a project’s or company’s risk. Members of an RMB are expected to have the expertise and skills in risk management based on their knowledge and skills in risk management. The expertise and skills in risk management are also expected to be developed through the RMB’s experience of executing repeated routine risk management tasks (Abdulla, 2017). A risk management system should function to bring to the board’s attention to the most material risks and permit the board to understand and evaluate how those risks interrelate, their possible impact, and how they may be addressed (Lipton, 2010).

There are essentially five objectives of a RMB whether in a business scenario or a project environment according to Chapman (2011):

1. It must simultaneously be entrepreneurial and drive the project forward while keeping it under control:
2. It should be sufficiently knowledgeable about the project and answerable for its implementation, yet able to stand back form the day-to-day management;
3. It must be sensitive to pressure of short-term issues and yet take account of broader, long-term trends;
4. It must be knowledgeable about local issues and be aware of potential or wider influences; and
5. It should be focused on the project while remaining accountable to various stakeholders.

A Risk Management Board undertakes policy formulation, strategic thinking, and supervisory management and accountability functions. The main task of the RMB is to ensure the effectiveness of the risk model of the project and consider the best modality for any particular project. For instance, the RMB could opt to have a risk leader with the authority to act on all risk management matters and especially if there is a project manager who undertakes the day to day running of the project, the board must be confident of the PM’s ability to act on risk. The board examines the risk analysis actions from an identification, assessment and mitigation standpoint and must be confident that the risk management offered to it is accurate, timely, clear and relevant.

Another role of the RMB is to routinely consult with key stakeholders to understand if their concerns, objectives have been captured, debated and aligned and whether they are being met in order to shield the project from breaking down. It also ensures that risk management and strategic planning are intertwined, remains focused on serious issues and is embedded throughout the organization. A project can fail if it operates without a central organ to consider and evaluate areas of risk, set in place mitigation measures and ways to manage risk when it does occur, and ensure that all stakeholders are well tuned to the systems and procedures and understanding of risk. Thus, the board is a critical organ to ensure that the risks are understood and addressed to ensure project success.

At the International Development Research Centre, risk is at the core of what the organization does. Risk management at IDRC is applied in an integrated manner and is governed by the provisions of a risk management policy. In order to do so, strengthened risk management approaches are reflected across all business practices at IDRC, and all IDRC employees must adhere to its provisions in their everyday work. The Centre’s risk management processes are designed to identify potential risks (positive or negative) that may affect the achievement of objectives, and to manage these within an agreed upon range of risk tolerances. Risk management is applied strategically and appropriately to provide reasonable assurance that the Centre will achieve its objectives. The onus for risk management falls on a risk management Committee with the following functions:

* Maintain responsibility for the integrated risk management process, including the processes used to identify, assess, respond to, and report on risk.
* Provide and maintain policies, frameworks, methodologies, and tools to business units and program areas for the identification, assessment, and management of risks.
* Assist the President with setting the risk appetite based on the strategic direction of IDRC, and the Board of Governor’s expectations.
* Assist with identifying, assessing, responding to, monitoring and reporting on corporate level risks through the Corporate Risk Profile on a bi-annual basis, or more frequently if warranted.
* Communicate the risk management process and Corporate Risk Profile to Centre Management Committee.

Applying good risk management concepts by adhering to the risk policy and its related procedure helps IDRC achieve its objectives by providing value added information and supporting good decision making. It is incumbent on all employees to adhere to IDRC’s Code of Conduct which requires employees to act in the best interest of the Centre. Non-compliance with the risk policy is viewed as falling short of IDRC’s acceptable standards of conduct.

1. **Explain the roles and responsibilities as well as selection of a project manager**

Project management can be defined as the process of controlling the achievement of the project objectives. Thus, a project manager is the person who oversees the process of controlling the achievement of the project objectives by managing the timelines, the resources and keeping to the scope of the project, planning the execution of the work, monitoring the progress of the work, and adjusting deviations from the plan (Munns and Bjeirmi, 1996). A project manager is essentially a leader. It is a role that encompasses motivating people and creating an effective work environment in order for the project team to successfully deliver on the objectives and goals of a project. A typical project manager has responsibility for successful project outcomes without sufficient power, budget, or people to handle all of the elements essential for project success.

Projects often have unknowns, complexities, and uncertainties given the environments in which they operate, the timelines, budgets and scope, the quality required, the human and technological resources available. Anantatmula (2010) posits that a project manager’s role is more challenging than that of a typical, functional manager as the work is across functional and organizational environments—traditionally designed to support functional managers. The project manager has other challenges such as providing leadership without documented, formal authority, and working in matrix organizations where centralized command is an issue.

A project manager can be viewed as a role of the chief executive that involves formulating objectives and strategy for the project, and through the purpose of the project, linking those objectives and strategy to the objectives and strategy of the parent organization. It can also be a role that involves the interpretation of plans and progress reports and redefining those plans them to achieve the project’s objectives (Turner and Muller, 2003). If the project manager’s role is accepted as that of a chief executive of a project, it also identifies the project manager’s additional responsibilities for managing the interface between other projects, stakeholders and the contribution to the overall objectives of the project.

A complimentary view sees the project manager as the agent of the owner/sponsor of the project. The owner then needs to appoint an agent, project manager, of appropriate competence, to manage the work of the temporary organization to achieve those ends. The competencies required when selecting a project manager include but are not limited to:

* Knowledge of project management, Planning and organization skills;
* Personnel management and communication skills;
* Problem solving capabilities, a strategic thinker with the ability to quickly develop alternative actions;
* Is capable of taking suggestions and understanding the views of project members;
* Effective time manager who can take initiative and is familiar with the organization.

According to Karlsen, Gottschalk & Andersen (2002), the project manager has 6 different categories of roles and responsibilities:

* Leader - the manager is responsible for supervising, hiring, training, organizing, coordinating, and motivating personnel as to reach the goals of the organization;
* Resource allocator – the project manager must decide how to allocate human, financial and information resources to the different tasks of the organization. This role emphasizes planning, organizing, coordinating and controlling tasks.
* Spokesperson - the project manager extends organizational contacts to areas outside of his or her own sphere. This role emphasizes promoting accept of the project within the organization, which the project is part of. One must cross traditional departmental boundaries.
* The manager identifies needs of project team members and develops solutions. A major responsibility of the manager is to ensure that rapidly evolving opportunities are understood, planned, implemented, and strategically exploited. A project manager leads the people and organs assigned to the project at any given point in time
* Monitoring – To monitor performance, cost and efficiency of all elements of the project and the project as a whole, exercising judgment and leadership in determining the causes of problems and facilitating solutions.
* Liaison - In this role, the manager communicates with persons external to the project like media, and the political class to get them to understand the project and the benefits that accrue to the community/environment in which it is implemented.

The project manager is therefore a key person in a project upon whom the success or failure of a project can rest. It is, therefore, important that sponsors or owners of projects undertake a rigorous recruitment process to select a project manager whose competencies are attuned to the type of project to be undertaken.

1. **List down the reasons for project termination. Explain each of them with an appropriate example.**

Projects are run in complex environments. These environments could change as projects are implemented, teams could change, budgets become constrained and the reasons for the projects could change over time. Projects are terminated for various reasons; not necessarily because they failed, which could be one reason, but also for other environmental, political, budgetary reasons and sometimes for reasons internal to the organization itself that was housing the project. It is estimated that a staggering 31.1 percent of software projects will be canceled before they ever get completed some due to incomplete requirements, lack of user involvement, lack of resources, unrealistic expectations, Lack of executive support, changing requirements, lack of planning, absence of need, lack of IT management, technology illiteracy (Bhoem, 2001). The decision to terminate a project can demoralize project managers and team members, and increase concerns about job security. For these reasons, managers tend to delay project termination decisions. However, delaying project termination diverts scarce R&D resources from higher potential projects. Projects are terminated for various reasons with three broad reasons encompassing:

**Project failure** – Projects fail. However, long before the failure of a project, there are always significant symptoms or "early warning signs" of trouble; an event or indication that predicts, cautions, or alerts one of possible or impending problems. Failure can come from various quarters: lack of support from management, lack of clear objectives and goals, rushed planning that did not take into consideration various elements of a project, a weak or incompetent project manager, lack of stakeholder engagement and a lack of understanding or the requirements, misappropriation of funds, lack of requisite skills or conflicts among project team members, not planning effectively for risks and a lack of an integrated change control mechanism.

In 2009, IDRC funded a governance project run by an NGO that was looking into building the capacity of legislators on security related matters. The budget was well understood and laid out item by item, the principle investigator who is like the project manager was on board and though there had been some conflict previously, the project was approved and the implementation phase rolled out. At the first milestone, questions were raised about the budget to which the budget notes were provided though raising some questions. By the second financial report, it was quite clear that the funds were not being used in the manner they had been allocated which called for a financial audit of the project. This revealed the funds were being used to finance other projects the project manager was running. The project could not run as funds were being diverted to other projects and recovery of those funds was also impossible to do. The project, one and a half years into it, had to be terminated to avoid further losses and is on record as one of the biggest project failures in a program at the organization. Sometimes, a project could be set up with all things considered but run into challenges because of the team or the project manager responsible for the project.

**Funding** – Projects are run at a cost and the financial resources must come from somewhere either because management is convinced of the value of the project, other stakeholders see the value of the project and thus claim a stake in the project by providing adequate financing of the project or projects. However, the needs of the organizations and stakeholders, the strategic direction taken by an organization, the environment in which a project operates could shift project dynamics that can lead to funds being channeled to projects considered of higher value or more strategic as time goes by. For instance, a project could start and donors put money in a pot to support the work of the project. By the time it rolls into year 3 or when the partners are in discussion for a phase 2 of the project, either the main donor or the organization that is implementing the project may find its priorities have shifted or the results it was looking for are not being realized fast enough and would be no longer interested in being part of a phase 2 and therefore withdraw funding. For a project originally set up to run in phases, the funding situation would have to be discussed at the senior management level to determine whether the remaining funds would be sufficient to undertake a subsequent phase or whether it would be better off to terminate the project as the intended results will not be realized. A project can therefore be terminated at the first 4 years rather than run it for the intended 8 years which is unfortunate for the organizations and those who were beneficiaries.

**End of the project –** Projects by definition have a defined start and defined end. One of the three constraints in project management is time. A project can be designed to last 2 years, 4 years, 10 years, depending on what the project is. Manufacturing, infrastructure, software development, research and development, healthcare projects all take different trajectories but with defined timelines. When the end date of a project is realized, the project gets terminated.

At IDRC, project timelines are defined in terms of months and depending on the project, they can go to 60 months some with the possibility of renewal, or going into a second or subsequent phases if funding is available. The Canadian International Food Security Fund (CIFSRF) was a jointly funded project between IDRC and Global Affairs Canada. This was run over 10 years with a 162 million Canadian dollar budget. It produced over 144 evidence-based innovations were developed and tested and reached 59 million people worldwide. It was by any standards a successful project. It had been projected as a 5 year project but because it ran successfully, more funding was released to run it for another 5 years and scale up the work done in the first five years. At its end date of September 2018, it was terminated having run its 10 year course. Therefore, a project can be terminated because it has run its course and accomplished its goals and objectives and other projects can build on the terminated project.

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