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NSSA-370
HW#6

3) Define the risk process in a project.

In every project, risk management should be done to reduce the chances of negative consequences impeding or delaying project success by ensuring the project works as planned and as expected, and by preventing cost overruns. The process begins with [***identifying***] risks, which is performed by at least one project team member who is also a brave risk-taker (usually the project manager, because one of his/her responsibilities is to understand the project risks in order to effectively handle them – but can also be any stakeholder involved in the project who is very willing to take action). In other words, the appropriate risk identifier – whether or not he/she is comfortable dealing with risks – truly cares about the overall project success, and is willing to help achieve that, even if some project risks don't affect him/her personally. In addition to having suitable risk identifier(s) to initiate the risk management process, an appropriate method, along with necessary tools and techniques, is required for this first step of the process.

Among the various methods for identifying risks, a Risk Breakdown Structure (RBS) provides deeper insight into every possible project risk, using a well-organized hierarchical format. The very top level displays high-level categorizations of each risk by who or what is being affected (e.g., various levels of management, the project itself, the environment, and outsourcing). Due to numerous possible categories, risks are classified as one of the following specific types: *negative risks* (those that pose threats to the project and its success factors: scope, time, cost, resources, performance, and value); *positive risks* (those that create more project opportunities, which could potentially add more value to the project); *internal risks* (project risks that may result from poor relationships between customers and the project team/organization, and from poor customer satisfaction; the project manager and stakeholders involved have the ability to manage these project risks); *external risks* (risks that the project manager and stakeholders are incapable of resolving – e.g., fluctuations in the economy, and emergency situations like natural disasters); or *residual risks* (the remaining risks, or new risks that appear after a particular portion of the project is implemented). The next level, directly below the top level of the RBS, shows all the possible factors that are directly associated with each specific risk; and another sub-level that's attached to this level shows the resulting possible effects of risks (per category and its contributing factors) on the outcome of the project.

To help fully develop risks, the project manager (or whoever is involved in risk identification) relies on a few commonly used project management tools that were mentioned in Chapter 3. For risk-management purposes, the risk identifier can apply *brainstorming* (a cost-free tool that members of the project team can use – with a disciplined approach – to openly and individually generate a list of possible project risks); *Nominal Grouping Technique* (everyone on the project team gathers in a

common environment to essentially *brainstorm* risks, but to do it more effectively by taking turns sharing his/her own list of risks and writing down all the risks on the team's writing board); and the *Delphi technique* (everyone on the project team seeks information and/or validation from experts to help the team formulate realistic, potential project risks; and each individual does it independently to avoid interpersonal conflicts resulting from personal/ideological differences). Furthermore, the risk identifier can use *checklists* – to consistently keep track of both risk compositions and the factors contributing to the formation of each risk – in order to determine whether certain suspected risks are mature enough to be considered project risks; do *mind mapping* (another cost-effective tool that allows the risk identifier to list out risks with respect to each project factor – scope, time, cost, resources, performance, and value – in order to spot any redundant risks); and importantly, apply *lessons learned from similar, past projects*: as reminders to reduce the likelihood of a reoccurrence of previously encountered issues.

Once the risks are developed, and approved by an appropriate upper-management level, the project manager (who may or may not be the risk identifier) can move on to the next step of the risk management process: [***assessing***] the risk values – either qualitatively or quantitatively. ***Qualitative risk assessment*** can be achieved by six possible methods. Earlier, I already discussed two: risk categorization (from the WBS), and expert judgement (from the Delphi technique). There are also two similar methods that look into the probability & impact of risks: one as an in-depth *Failure Mode and Effects (FMEA) analysis*, the other as a probability-and-impact matrix. Both methods help detect the likelihood of occurrence for each unique risk, and the severity of each unique risk's effects on such project factors as schedule, cost, and performance. The remaining methods are *risk urgency assessment* (which focuses on how soon to respond to risks based on their priority levels), and *risk data quality assessment* (to evaluate the accuracy per risk, and the level of understanding by members involved in the project).

On the other hand, ***quantitative risk assessment*** can be achieved by four possible methods. One of them is also present in *qualitative risk assessment* (and in the Delphi technique): expert judgement. Another method is to use data gathering and representation techniques to discover possible best and worst-case scenarios (and the most common scenarios) for project activities. The remaining two methods emphasize risk measurement; the quantitative risk analysis uses decision-trees to help the project manager see which risks matter more than others based on conditional probability, which examines the likelihood that a particular project activity will occur given the resulting likelihood of a preceding activity. Again, decision-trees produce a quantitative measure called Expected Value (EV); when applied to risk management, the EV of a risk event is assessed, and results from the product of the likelihood of a risk event and the value of that risk event. Being able to recognize the EV's allows the project manager to see which risk events present opportunities and which ones present threats to the project, allowing the project manager to wisely prioritize the order in which risks will be mitigated (or choose the most critical path of mitigating risks).

Now that the project manager better understands the identified risks, he/she can start [***planning***] for risk mitigation: minimizing the presence of existing risks and/or easing the severity of risk effects on the project. It's necessary to identify as many contingencies as possible to prepare for managing future risks resulting from negative consequences of the project. In order to create contingency plans, the project manager first pays close attention to the emergence of risks and assesses their likelihood and impact, then uses these assessed measures to come up with a plan for restoring a possibly severely impacted project; and just like in the development life cycle, the planned actions need to be tested for effectiveness prior to their implementation.

The project manager needs to then actively [***monitor and control***] risks by continuing to predict the likelihood and the severity of future risk events, using the results obtained so far from the previous steps in the risk management process. The project manager has to keep an eye on potential risk triggers (or indications of a risk's state of occurrence: either the risk has occurred or is about to occur), because risks could continue to rise at any point of progression throughout the project's lifespan. Also, every new source that's identified needs to be updated in all documents pertaining to risks and project plans (e.g., risk register, and project management/mitigation plans).

Now that a project manager knows what to do when monitoring and controlling risks, he/she needs to choose at least one of the several tools and techniques for performing these tasks. Repeating a *risk assessment* would help the project manager easily identify new risks and their root causes as the project progresses, which allows him/her to analyze measurement changes (to the likelihood, to the impact, and to the ease of detection) since the last time results were collected; and the changes in results keep the project manager focused on the risks' current state and future state. A *reserve analysis* is used similarly, but focuses more specifically on the risk values to determine whether the risk effects – on at least the schedule, cost, and resources in a project – are positive or negative, and to determine when to use the previously planned contingencies. Other types of analyses that could be used are *variance* (which considers the comparison of the project's estimated costs and/or schedule to their actual values in determining both whether certain risks can be accepted, and the variances in cost, schedule, quality, and scope) *and trends analysis* (which helps to predict the project's future performance based on prior performances).

In addition to the advantages of using *variance and trends analysis*, *technical performance measurement* can further help the project manager keep up with the project's performance over time by offering key metrics (key performance parameters, or KPP) to easily compare between the project's current performance and the desired performance (indicated by a target baseline). This in-depth comparison allows the project manager to better understand the project's weaknesses, and prompt him/her to take appropriate action to prevent disruptions to the project – such as scheduling regular *status meetings* – to update every involved stakeholder with progress changes, and on risk mitigation plans. One last technique for monitoring and controlling risks is for a risk auditor (not the project manager) to conduct *risk audits* to further assess the

effectiveness of various areas as the project progresses (e.g., the project manager's performance, project scheduling, and planned actions in response to risk effects).

Because risks are inevitable, risk management is a continuous process, especially after a project's closure. Again, the risk management process runs in the following order: risk identification, a qualitative and/or quantitative assessment of risk values, risk-mitigation planning, and risk monitoring/control. It's imperative to follow these steps properly, and consistently update the project's progress, while going through the full process, to ensure the project is on track toward success, and free of harmful risks.

13) How can risks be managed?

One of the four possible ways to manage risks was mentioned in my answer to question 3 above – [***risk mitigation***] – which is done continuously across the project life cycle, especially after the project is completed. In addition to the considerations (including the necessary tools and techniques) for planning risk mitigation, risks can be mitigated by executing similarly planned actions to each project success factor, separately. Cost is managed most carefully because cost estimations often exclude certain risks, leading to unnecessary cost overruns. To help minimize cost-related risks, the project manager should identify and keep track of both factors that influence costs, and the relationships among individual tasks involved in the mitigation process. Also, the project manager should thoroughly research information (e.g., on alternatives, tools, techniques, methods, etc.) and take into account the information gathered when recalculating cost estimates, and choosing the best solution for risk mitigation (which again, requires the chosen solution to be tested for its effectiveness).

Despite having such a useful resource at hand, the project team (not just the project manager) will also encounter risks associated with *resources*, which can be reduced in various ways. The project manager is capable of ensuring that no task is left unassigned, allocating resources to meet project demands, and managing the project staff effectively (as in selecting members who are best suited for particular tasks, acknowledging their good performances, and understanding all involved members' roles and levels of commitment to their assignments in order to develop trust). Members of the project team (other than the project manager) who also understand each individual's service level could help add transparency to the project team. For example, they would update each other on the latest availability of resources so that each member is able to use resources at hand more efficiently.

Even though resources are well allocated or of good quality, the resulting simplification may negatively impact performance such that members of the project team may feel overconfident about their chosen best solution, believing it should also work in other situations. Falling into this trap will leave them unaware, and therefore, unprepared for unforeseen risks. Still, members of the project team can reduce performance-related risks by continuously performing qualitative and quantitative

assessments on risk values, and frequently testing their planned actions or risk responses (with the involvement of experts to evaluate for effectiveness and accuracy).

To ensure effectiveness and accuracy, the project manager is responsible for consistently monitoring/controlling the project's scope to prevent the chances of project failure (resulting from negative risk effects taking over the project's progress). The project manager needs to make sure everything that's important to the project's success is well defined (e.g., activities & tasks, customer requirements, scope statement, project documents, and their changes). In addition to clarifying the project more in detail to every stakeholder involved, the project manager has to set realistic, reachable deadlines by allocating a fair amount of time per task in order to keep the project on track.

This leads the project manager to focus on the project schedule, where possible uncertainty forces the project manager to make further adjustments to the original plans (that's only if the project manager puts in effort to prevent project delays). It's recommended that the project manager prioritizes the high risks sooner (of course, with the best suited people to handle them) to allow the project team to fail early, and improve faster; and to quickly move away from failure, everyone on the project team (not necessarily external stakeholders, who may have their own schedules) should consistently follow their agreed-upon schedule so that everyone's on the same page.

Dealing with the five project factors just mentioned contributes to the project manager's handling of risks associated with the project's value. It's imperative to compare the qualities of each project factor with the risks associated with each factor in order to realize whether its benefits or its risks has a greater effect on the project. If the first is valid (and the project aligns with organizational vision), then project value is created, but will also be monitored to reduce its chances of facing unexpected risks. On the other hand, if risks are more prevalent, then the project manager needs to revisit major costs and estimations, re-evaluate certain benefits to the project, and shift his/her attention back to market conditions (to better understand the industry that's linked to the project, and to see if the project remains as a solution to problem(s) in that industry; if so, the project is still valuable to that industry, otherwise, the project fails to meet that industry's demands).

Besides *risk mitigation*, risks can be partially or completely [***transferred***] – bi-directionally – between the project team (or the project organization) and the contractors (who were hired to partake in the project). The reason why not every risk may be transferred is that some risks can continue to multiply and/or create other risks. Regardless of the end result, the project team (or the project organization) can still transfer an indefinite amount of risks as long as it is able to manage both the known and unknown risks resulting from contractors' signing an incentive-fee contract with the project organization. According to this contract, the project organization agrees to pay contractors for their work; and both parties understand they will encounter shared risks at some point in the project lifespan. Let's say the project organization encounters a particular risk first, then passes that risk to the hired contractors to deal with it; the

project organization may not want to deal with risk-induced complexities, due to lack of experience and/or intense fear, so the project organization tries to maintain the contractors' involvement, using a strong reward system, in order for both parties to continue cooperating. As a result, when the project organization manages the contractors effectively, the contractors remain driven to continue the project, leading to an ongoing partnership that indicates a successful transfer of risks between both parties.

Moreover, there are two other ways to manage risks, which can be done almost effortlessly. The project team (or the project organization) may choose to simply [***avoid***] risks by taking alternative action, such as changing their plans frequently, instead of dealing with risks as they arise. Because risks are present in every project stage, the project team needs to understand the current state of the project environment to help alleviate risk-induced stress, and to confidently continue the project. The project team also needs to continuously re-evaluate the potential benefits to the project, so that the team is able to notice positive outcomes that would've been missed if risks were avoided too soon. Since not all risks are negative, it's fair enough to – instead – reduce risks by the least acceptable amount (which varies per project team/organization). Last, if the project team decides not to avoid risks, it can choose to be conservative by simply enjoying the project benefits and [***accepting***] both positive and negative risks; still, dealing with risks in such a way can only be effective if the risks have little or no impact on the project and its success factors (scope, time, cost, resources, performance, and value). On the whole, risks are usually managed by mitigating and/or transferring risks, but can – to a certain extent – be managed by simply avoiding or accepting risks.

Grade: 100 / 100

Professor's Feedback:

3. Pretty thorough!

13. Once again, a thorough discussion. I'll add my "two cents" to the answer:

> *Risks need to be actively monitored and updated as the landscape changes. Some actions or tools that could be utilized are: Risk Audits, variance and trend analysis, performance measurement, status meetings and (doing additional) risk assessments.*

I made risk review a standing agenda item in my status meetings.