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Did Oswald Have a Chance to Kill The President? A Project Risk Analysis Perspective

There are so many analytical techniques and tools, some of which are very complex and require a lot of effort to perform and others which are very industry specific. One of the very simple techniques is expected value analysis. This analysis is a choice engineering method, which means that it is more of a mental exercise rather than a strict and formal project management process. At the same time, going through the expected value thinking process may significantly improve quality of decisions.

Project management offers a powerful set of methods and tools to solve many complex problems. Quantitative project risk analysis using Monte Carlo simulation is one of them. It allows project managers to create and manage realistic or so-called "risk-adjusted" project schedules that take into account multiple risks and uncertainties. Despite the fact that this methodology has proven to be very powerful and useful, it is not used as widely as it could be. Moreover, often it is used inappropriately and yields incorrect results.

To demonstrate how to use quantitative project risk analysis, we decided to use a well-known historical event, the assignation of U.S. President John Kennedy. On November 22, 1963, President John Kennedy was fatally shot by a sniper in Dallas, Texas. A ten-month investigation by the Warren Commission concluded that Kennedy was assassinated by Lee Harvey Oswald acting alone; however many believe that Kennedy was killed as a result of a conspiracy. Using project risk analysis, we decided to assess whether Oswald would have had a realistic chance to kill the President. But before we begin, a small disclaimer: we do not claim to possess exact information especially with regards to the probabilities and impacts of certain risks; and therefore, cannot give a definite answer from the historical point of view. This example is only intended to illustrate project risk analysis methodology.

What we are trying to achieve is called forensic risk analysis. In most cases, project risk analysis is performed prior to the start of a project or during execution to generate probabilities

of meeting project objectives. But in this case, we are trying to determine the chance that Oswald could complete his project – the assassination of President Kennedy - as it actually occurred.

The steps which Oswald performed were documented by the Warren Commission with accuracy of plus or minus a few minutes. Oswald was probably on the 6th floor of the Texas School Book Depository at 12:10, 20 minutes before the first shot was fired. Oswald fired three rifle shots from the sixth-floor window of the Book Depository at 12:30. Immediately after the shooting Oswald went downstairs and at 12:40 boarded a city bus but got off two blocks later. He then hailed a taxi and arrived at his rooming house at 1 p.m. At 1:15 Dallas Patrolman J. D. Tippit was shot by Oswald approximately 1.4 km from Oswald's rooming house. Oswald was arrested at the Texas Theatre after 1:40.

The project schedule is one of the inputs of project risk analysis. The second one is a risk register. In general, the risks may affect project scope, duration, cost, safety, security, quality, etc. But in this case we would analyze how risks would affect a duration.

One of risks is that Oswald would be discovered earlier. When Oswald was taking a bus, taxi, or walk, it could take longer. Such risks as "rifle misfires", the "President's motorcade changes planned course" or "missed shot" are not included as they do not directly affect duration.

After we identified risks, we need to assign them to tasks and resources. At this moment we would enter probabilities and impact of risks. For example, the risk "Oswald discovered earlier" can cause cancelation of the task and all its successors. The risk "Walk takes longer…" can cause an increase of task duration.

In general, risks can be related to each other, for example one risk can trigger another risk. Risks can occur on a certain moment during a course of the task. The same event may have different alternative outcomes, for example 10% cancel task, 20% delay tasks and 5% accelerate the tasks, which is an opportunity. The process of modeling schedule with risks and identifying relationship between risks is called "Event Chain Methodology".

The risk register includes only the most important risks and may not include many low probability and low impact events. For example, Oswald could trip over while running downstairs, or he could not be able to open a window on 6th floor. To model these "noise" events, we can use a statistical distribution of task duration by defining low and high duration of each task. In our example low and high duration will be calculated by multiplying base duration on 0.9 and 1.2. However it is important that this statistical distribution would not include impact of events from risk register, otherwise we would count this impact twice.

The next step is to perform Monte Carlo simulation. Figure 1 shows original project schedule. Arrows on a chart represent risks. A Gantt chart with risks shown on them is called an Event Chain Diagram.

Task Name	Low Dur	Base Dur	High Dur	Risks
Set up on 6th floor	18 min	20 min	24 min	2
Shooting	0.9 min	1 min	1.2 min	2
Go downstairs and wait to	8.1 min	9 min	10.8 min	5
Ride bus	4.5 min	5 min	6 min	3
Take taxi	13.5 min	15 min	18 min	3
Went home	1.8 min	2 min	2.4 min	2
Walk from home	10.8 min	12 min	14.4 min	3
Shot police	0.9 min	1 min	1.2 min	2
Walk and go to the theatre	22.5 min	25 min	30 min	3
Arrest	0 min	0 min	0 min	0

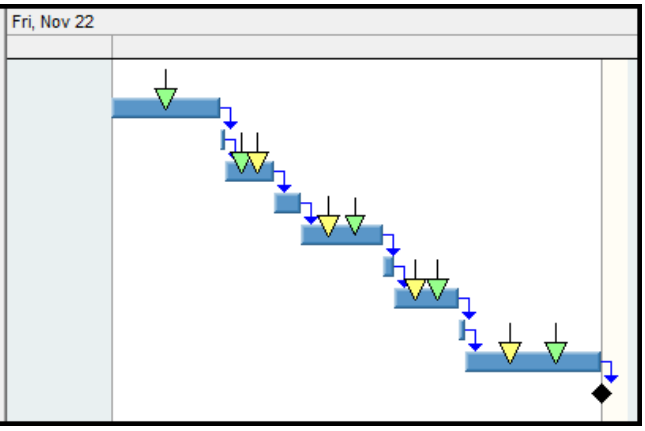

Figure 1. Original Project Schedule

Figure 2 shows a risk register with calculated risk probability, impact, and score. Calculated risk probability and impact may be different than the risk impact we enter when we assign risk to individual tasks, as one risk may be assigned to multiple tasks or resources.

	Risk Name	Risk/Issue	Threat/Oppo...	Risk Assigned To	Prob...	Impa...	Sco...	Score
1	Oswald discovered during escaping	Risk	Threat	Assigned to 7 tasks/resource	41.0%	38.9%	16.0%	
2	Oswald discovered on 6th floor	Risk	Threat	Assigned to 2 tasks/resource	34.6%	15.2%	5.3%	
3	Walk takes longer	Risk	Threat	Assigned to 2 tasks/resource	21.7%	8.7%	1.9%	
4	Bus does not come on time	Risk	Threat	Task 4: Go downstairs and w	60.0%	0.0%	0.0%	
5	Bus trip takes longer	Risk	Threat	Task 5: Ride bus	50.0%	0.0%	0.0%	
6	Waiting for a taxi	Risk	Threat	Task 6: Take taxi	30.0%	0.0%	0.0%	

Figure 2. Risk Register

From our analysis the most important risk (the one with the highest score) is “Oswald discovered during escaping”. If this was a normal project, this risk would have the highest priority when performing mitigation and risk response planning; however, it does not look like Oswald put a lot of efforts into mitigating this risk.

Figure 3 shows a frequency chart for project duration. Because Oswald could be discovered earlier, the “project” can be canceled and duration can be less than 1h 30 minutes.

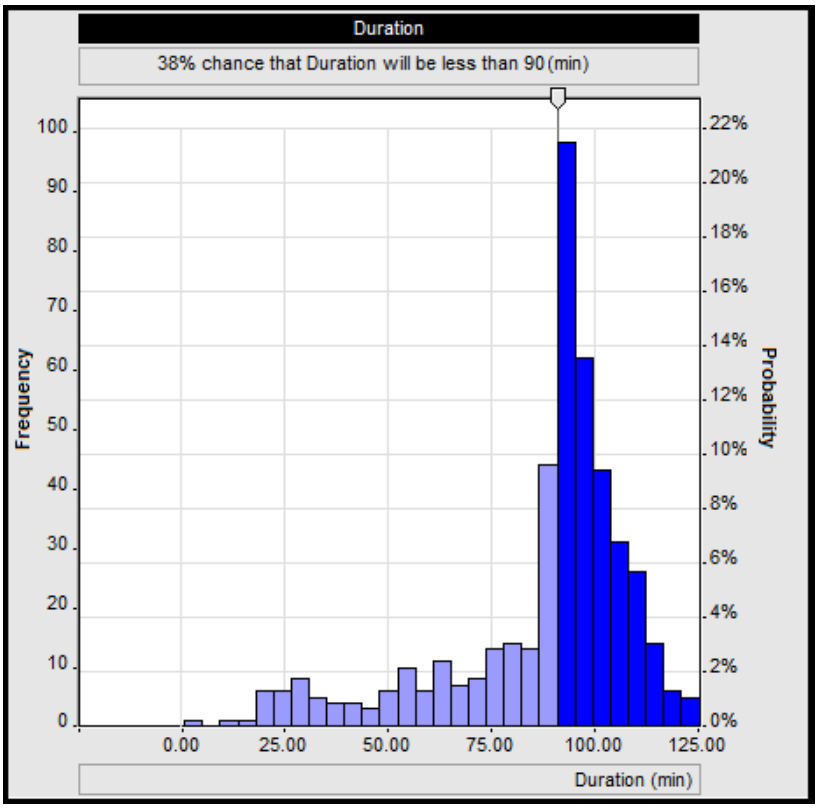

Figure 3: Frequency histogram

The analysis shows that that chance this project can be completed within 1h 30 min plus minus 5 minutes is 33%. The statistical distribution of project duration is quite wide: this indicates that the project was very risky and could mean that either Oswald was either very lucky or had outside help.

Quantitative Risk analysis and particularly Event Chain Methodology is a very powerful tool and can be beneficial to a project of any size: from large programs running for many years to small projects which take just a few weeks.