"Project Management Using Earned Value"
Case Study Solution 3.1

3.1

CASE STUDY

Quantified Risk Assessment

Quantified Risk Assessment Case Solution

Introduction

As with any risk assessment problem, quantification of risk is dependent upon a good understanding of the issues and a valid interpretation of where the issues fit within the probability and weighting scales for each defined category of risk drivers and risk consequences. Certain assumptions must be made, depending upon the quantity and quality of the data provided by the program participants. In a real situation, issues can often be clarified through individual questioning and/or by team review. Judgments by the program manager, IPT Leader, and others making decisions on risk assessment play a large role, and results can range from more to less conservative depending upon these judgments.

The information provided in the Case Study is necessarily limited, and several assumptions and interpretations must be made in order to arrive at a risk score. It is important to explain the basis of the risk probabilities and consequences selected. The solutions given here should be considered as examples only.

Central/Interface Processor Hardware

Ranked scores:

Manufacturing (Vendor Process)	=	10.5
Engineering (Late Design)	=	5.6
Management (Test Equipment)	=	5.0
Requirements (Some risk defined)	=	1.8
Total	=	22.9

Assumptions and Interpretations:

1. The vendor process was given a high-risk probability (0.7) based upon available data describing the requirement for a "new process," and the potential impacts on performance and schedules are significant. It is also assumed that vendor costs may increase above target under the FPI contract. Even if vendor costs did not increase, some managers may want to include a cost impact for the potential overall program slip.

2. Because the design is complex, it was given a high-risk probability (0.7). Although the problem states that the design is expected to meet performance, a conservative approach might include some risk impact, but this has not been included in the sample solution. Because the Test Team Leader believes that these schedules are tight and cannot accommodate the design slips, he/she wants to include some potential slip to system schedules, as shown in the solution.

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3. The risk probability for test equipment availability (0.5) may be conservatively high in the sample solution, as the test engineer only recently "mentioned" a possible delay, and this may be a statement to get program management attention to help in getting needed resources. More information is needed to ascertain the seriousness of the situation.

4. As the problem was stated, requirements completion does not appear to be a major issue, and is ranked lowest in risk. However, additional questions should be asked to ensure that the specifications not yet completed and approved do not significantly affect completion of a design that meets performance.

System Software (SS)

Ranked scores:

Requirements (Definition)	=	8.0
Management (Design tools)	=	3.0
Engineering (Performance)	=	2.0
Total	=	13.0

Assumptions and Interpretations:

1. The requirements are judged to have the highest impact on SS risk. The probability of 0.5 indicates that no critical requirements are yet to be defined; however, the impact to schedules and cost is significant. Although performance consequences were not mentioned, the IPT leader wants to account for some performance risk because several important areas still need definition. In this sample solution, the performance risk consequence was selected as 2, a judgmental interpolation between two values in the table.

2. The risk probability for design tools was deemed to be 0.3 (limited resource), as the tools are late only, and it is not stated that they must be developed. A more conservative approach would be to choose 0.4 or 0.5.

3. As the existing software modules require "considerable" modification, this was interpreted to be "major," with a probability of 0.4. The only risk consequence to be accounted for was in performance. Although it was stated that impact to schedule and cost is negligible, further investigation should be undertaken as design issues are high leverage to total program performance.

Quantified Risk Assessment Case Solution
Quantified Technical Risk Assessment
Data Form

WBS Element No. 1010302 **Date** 1/17/XX

System Element Title Central/Interface Proc. Hardware **CAM** R.A. Moore

System Element Description: High-speed digital processing subsystem for deciphering specialized security codes and providing synchronization and interface data exchange among all subsystems.

Issues:

1. Some specs require completion and approval: 1 milestone missed, 5% cost increase.
2. ASIC for timing and control (P/N 4K25-046): design late 2 months, plan to make up in test; cost could increase 5-7%.
3. ASIC vendor process late: 4 months slip for ASIC deliveries, 2-mos system schedule impact; may not meet spec, could reduce system timing margins to 0.
4. Test consoles no. 1 & 2 may slip: 1 mo-effect on system schedule, 15% cost increase.

Assumptions:

1. No technology issues.
2. Support to be addressed later.
3. Subcontract is FPI and Program Manager wants to include possible costs above target.
4. Test Team Leader believes test schedule tight, and late design risk should include 1 mo slip to system schedule.

Assessment Summary Table

Requirements		**Technology**		**Management**	
Score = 1.8		**Score = N/A**		**Score = 5.0**	
Probability: 0.3	**P = 0** **C = 3** **S = 3**	**Probability:**	**P =** **C =** **S =**	**Probability: 0.5**	**P = 0** **C = 5** **S = 5**
Engineering		**Manufacturing**		**Support**	
Score = 5.6		**Score = 10.5**		**Score = N/A**	
Probability: 0.7	**P = 0** **C = 3** **S = 5**	**Probability: 0.7**	**P = 7** **C = 3** **S = 5**	**Probability:**	**P =** **C =** **S =**

Total Score: 22.9

Quantified Risk Assessment Case Solution
Quantified Technical Risk Assessment
Data Form

WBS Element No. _1010501_ **Date** 1/17/XX

System Element Title _System Software (SS)_ **CAM** T.K. Chang

System Element Description: Software provides system-level functions and control. Programmed in C++ to run on new hardware with upgraded operating system.

Issues:

1. Some non-critical, but important requirements not defined and could cause up to 3-mo delay in system schedule and 25% cost increase.
2. Planned modifications to off-the-shelf modules may not meet all SS performance specs; may be moderate degradation to system performance margins. There are negligible impact to cost and schedule.
3. Design tools and new compiler are late by 2 months and will cost up to 20% more. Unknown if any system schedules impact.

Assumptions:

1. No new technology.
2. Support not yet considered.
3. IPT Leader wants to account for possible performance issues due to late requirements: minor effect on SS, none on total system.
4. Program Manager assumes there may be a 1-month system schedule slip because of late design tools.

Assessment Summary Table

Requirements		**Technology**		**Management**	
Score = 8.0		**Score = N/A**		**Score = 3.0**	
Probability: 0.5	**P = 2** **C = 7** **S = 7**	**Probability:**	**P =** **C =** **S =**	**Probability: 0.3**	**P = 0** **C = 5** **S = 5**
Engineering		**Manufacturing**		**Support**	
Score = 2.0		**Score = N/A**		**Score = N/A**	
Probability: 0.4	**P = 5** **C = 0** **S = 0**	**Probability:**	**P =** **C =** **S =**	**Probability:**	**P =** **C =** **S =**

Total Score: 13.0