Risk under the Microscope

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The Field Service Engineer (FSE) at RedGate Technology had called an escalation Level 4 meeting to resolve a computer failure issue during the project—tool upgrade for imaging and wafer transfer improvement. The company's escalation process requires that the FSE escalate the problem, if it has not been resolved after six hours. The escalation is now closed; however, the tool was down for three days, which means daily schedule of the upgrade may need to be revisited. The tool at the RedGate Technology site is the first tool to be upgraded so the team wants to capture as much learning experience as possible to make the next upgrades run more smoothly. This is a case about the unknown project problem that suddenly occurred and how risk planning prepared the team for mitigation of damage, even though a root cause was not known.

THE MEETING

The project update meeting with the core team is underway:

Product Engineer: Adam McAllister
Technical Support Engineer: Donna Nolan
Systems Engineer: Calvin James
Project Manager: Jason Orange
Program Manager: Julia Gallagher

Jason: Hi everyone. Thanks for coming. Julia suggested we meet and review our upgrade schedule. We have another tool to be upgraded in two months so we should make quick changes on any design or work instructions that need to be improved. Donna sent out the escalation report describing what happened and the root cause of the issue.

Donna: Yes, I sent it to the team as well as the Field Service Engineers (FSE) at the site. Calvin and Adam are working on retesting the computer and identifying the root cause, and the fix, so that we know what to do if it happens again. I hope it won't happen again, however.

Jason: Good. It sounds like everything is under control now in terms of troubleshooting the tool.

Calvin: Well, actually, I haven't had any luck on reproducing the error that they saw at the site. I talked to Nick Filan, the lead FSE, about what happened. He told me that it was the "blue screen" phenomena—the computer worked fine and then the screen was blue all of the sudden. They were not able to recover the error at all.

Jason: Have you seen this happening before?

Calvin: I don't have much experience on this tool so I don't have any historical issues that I've seen with my own eyes. I couldn't reproduce what they said was happening prior to the "blue screen" phenomena, but I couldn't get the blue screen on my simulator.

Jason: Yes, I realized Steve Huggins did not give you any briefing before he left the company. It would be nice if he had documented everything that he'd seen when designing this system.

Adam: I haven't heard of it happening before. Calvin and I can ask other engineers to get their input on this issue. The bad thing is that this computer is a new design so it has not been implemented on other product lines. I don't know what kind of information I can get from asking around other engineers.

Jason: Well, it never hurts to try. Let me know if you're running into more issues. Now we can update the schedule to accommodate the time lost during troubleshooting.

BACKGROUND

The IEM Company is a high-tech company producing customized Ion and Electron Microscopes. The applications of their products can be used in a variety of fields, from academia to high-tech industries. Their customers are given the options of customizing the product to meet specific process needs. The company's financial profile shows that their sales revenue for last year exceeds $400 million. The company is currently upgrading tools in the field for improvement in the imaging and wafer transfer system. This is required to grow the market size and to meet customers' satisfaction.

RISK PLAN

Julia: Jason, can you give a brief update on how we are on the schedule?

Jason: Sure. From the Gantt chart that I sent you yesterday, we are currently three days behind schedule. Rob Carter, the process engineer at RedGate, told me that the tool handover to production cannot be delayed due to production backlog. We may need to add a second shift for the upgrade to mitigate the scheduling issue.

Julia: What is the original upgrade timeline, Jason?

Jason: The tool is promised to be ready for production within two weeks.

Julia: Before we move forward on deciding what to do next, can we review your project scope and risk planning matrix? I've only seen your scheduling chart but did not have a chance to review the whole package when I approved this project.

Jason: Yes, I was aware that Marketing and Sales already promised the date to the customer before I finished creating this Gantt chart. I did not know the change on the timeline and date until I asked Markus if there were any changes on the project. If only our communication could be improved . . .

Julia: Well, that was in the past, now we have to create a mitigation plan for it. Have we figured out what the root cause of the problem is?

Jason: No, our original Systems Engineer for this project, Steve Huggins, left the company two weeks ago. He only gave a two-week notice and then was out of the office the last week before he left to use up his vacation days. Calvin James replaced him for this project; however, he is quite new to this product line so he is still learning on the go. He has not figured out the root cause of the problem yet.

Julia: Interesting. Can you describe what you included in the risk plan?

Jason: Yes, the core team brainstormed what should be considered risks for this project. We were focusing more on the design and supply chain, however. The implementation plan was assumed to be handled by the Technical Support Group (TSG). We grouped the risk plan per main category, for example, in Design, we split up the risk plans to Hardware and Software groups. We did it this way so that we can manage it much easier since the activity list from the WBS is quite big. We used discrete estimation for probability and risk impact. The qualitative data was per our best estimate learning from past projects. Steve Huggins had been involved in two major tool improvement projects in the past so he was very knowledgeable in this area. Here's the risk plan for the Software activity list (see Table 11.1).

Julia: So you excluded most activities in the WBS from the risk plan?

Jason: That's right. We thought we should only list activities with medium and high risk. What's the point of recording low-risk activities if they're not going to affect the project by much? Anyway, you can see that we did include computer testing as part of our WBS.

Julia: Yes, however, did you guys test for long-term reliability? I know we don't know why we had blue screen problem in the field but you might have caught it, if you tested the part for a long period of time.

Jason: No, we didn't do that. We only tested the first article for making sure most features worked because we didn't have time for a long-term reliability test.

Julia: Hmm . . . that's a little odd. Did you find out the plan developed by TSG?

Jason: No. When I submitted the project charter, our scope was only on the design, development, and testing.

Donna: The TSG are responsible for performing the task of upgrading the tool, however, since you are the project manager, you are the one responsible for connecting the whole areas, including field implementation. I was not aware that you assumed we were going to do the whole field implementation plan, while you were working on the upgrade schedule.

Julia: I can see there's a disconnect among core team members . . .

Table 11.1 Software Risk Plan

					Actions			Owner
Task	**Risk Description**	**Prob-ability***	**Risk Impact****	**Risk Score P +(2×I)**	**Preventive**	**Trigger Points**	**Contingent**	
Review marketing require-ment document	Marketing requirement does not include all customer's requests	2	4	10	Review marketing requirement document with the customer's process engineer before design phase kicks off	No customer's process engineer available for review meeting by June 30th	Escalate to the manager for their POC avail-ability	Project manager
Identify required changes on computer config-uration	Not enough knowledge on new process to be implemented	3	4	11	Review other tools' application to see if we can use their concept	Not enough data to determine what application can be used as an example by June 30th	Contact customer's expert to see if there's any current applications similar to the new process	Software engineer
Determine time and cost budget for new computer	Supplier can't meet our short timeline request to implement changes	4	5	14	Send specifi-cations prior to design reviews	Supplier's timeline is 2 weeks longer than expected	Send specifi-cations to a few suppliers and go with the fastest delivery timeline.	Sourcing rep

| Task | Risk Description | Prob-ability* | Risk Impact** | Risk Score P +(2×I) | Actions | | | Owner |
					Preventive	Trigger Points	Contingent	
Create success measures for computer tests	Success measures do not reflect all actual use cases	4	5	14	Review success measures with other software engineers for fresh-eye review	No feedback from other software engineers by July 10th	Escalate to project manager for help in gathering resources	Software engineer

*Probability (Discrete Estimation): 1=Very Unlikely, 2=Low Likelihood, 3=Likely, 4=Highly Likely, 5=Near Certain

**Risk Impact (Discrete Estimation): 1=Very Low Impact, 2=Low Impact, 3=Medium Impact, 4=High Impact, 5=Very High Impact

Discussion items

1. To some, these risk plans are wrong. What do you think might be wrong with the risk plan? Should Julia agree with the risk plan?
2. How can the project risk planning be improved in each of the following areas: project organization, implementation, strategy, leadership?
3. What would be the next step for the team to recover?