M.E.N.A.C.E.

Motorized Embedded Network-connected smArt Car Entity

DIT524 - PROJECT:
SYSTEMS DEVELOPMENT

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RISK MONITORING DOCUMENT

The risk management comprises four processes:

Risk Identification contains the unique Id, date of creation, description.

Risk Analysis contains the likelihood and the impact of the risk analyzed.

Risk Planning contains the preventive measures to lower down the likelihood, the mitigation, and constant monitoring of process to identify new risks.

Risk Monitoring should be integrated on the project activities. It contains the tracking of the risks and the review of it (close, lower the risk probability, so on), the preparation of status reports, search for new risks.

The three risk management processes mentioned earlier were done at the beginning of the project and they are presented on the Tables 1 to 14, they are placed from the highest to the lowest “probability to happen” and from severe to minor “possible consequences”. The tables 15 to 28 shows the risk monitoring process, which was done on the 1st of May, sprint 6. Two of the risks identified previously, the 04 and 12, were closed, 4 stayed in the same level, 3 were lowered and 5 were highered. The ones that were lowered are the lack of commitment, the lack of skills and the tasks estimation, with the following unique ids 02, 03 and 06. It was expected to happen.

Table 1. Risk 01 with high probability and severe consequences.

Unique Id: 01	**Created on: 11/02/2017**
Title	**Unfamiliar languages**
Description	The students have no knowledge of languages other than Java.
Probability to happen:	High (>50%)
Possible consequence:	Severe
Risk avoidance:	It is not avoidable.
Risk mitigation:	Dedicate a time slot to educate the team on the skills they will need. Turn to the TAs and other students for additional guidance.

Table 2. Risk 02 with high probability and severe consequences.

Unique Id: 02	**Created on: 11/02/2017**
Title	**A developer has lack of key skills**
Description	The students don't have necessary knowledge to work on the tasks assigned.
Probability to happen:	High (>50%)
Possible consequence:	Severe
Risk avoidance:	Ask for help from other team members or TAs and try to learn. Try to keep the activities related to the skills each team member has.
Risk mitigation:	Use pair programming to equally distribute the skills availability.

Table 3. Risk 03 with high probability and medium consequences.

Unique Id: 03	**Created on: 11/02/2017**
Title	**Size underestimate**
Description	The size of a feature, functionality and task has been underestimated.
Probability to happen:	High (>50%)
Possible consequence:	Medium

Risk avoidance:	Playing risk poker to estimate the user stories can lead us to a more accurate estimation. Afterwards, create subtasks for each user story and estimate as well. The sum of these subtasks estimation should be the final estimation for the related user story.
Risk mitigation:	Reduce the sprint backlog and depending on how long it takes, reduce the requirements number.

Table 4. Risk 04 with medium probability and severe consequences.

Unique Id: 04	**Created on: 11/02/2017**
Title	**Multiple Stakeholders**
Description	More than one stakeholder was identified for the project, having that in consideration, different people can have different expectations about the same product feature.
Probability to happen:	Medium (25 - 50%)
Possible consequence:	Severe
Risk avoidance:	It is not avoidable.
Risk mitigation:	Have regular meetings with stakeholders. and evaluate which of the ideas given is more suitable for the system, estimate it, in case it's a new requirement, and include it in the product backlog.

Table 5. Risk 05 with medium probability and severe consequences.

Unique Id: 05	**Created on: 11/02/2017**
Title	**Car hardware problems**
Description	The Arduino or any other car component does not function properly.
Probability to happen:	Medium (25 - 50%)
Possible consequence:	Severe
Risk avoidance:	It is not avoidable.
Risk mitigation:	Ask the TAs for assistance.

Table 6. Risk 06 with medium probability and severe consequences.

Unique Id: 06	**Created on: 11/02/2017**

Title	**A developer is not committed to the project**
Description	A developer does not take part in the project in some of the phases.
Probability to happen:	Medium (25 - 50%)
Possible consequence:	Severe
Risk avoidance:	It is not avoidable.
Risk mitigation:	Have a meeting where the group can talk with each other; if this does not show results, talk with the TAs and teachers.

Table 7. Risk 07 with medium probability and minor to severe consequences.

Unique Id: 07	**Created on: 11/02/2017**
Title	**A developer misses meetings**
Description	Students that for any reason miss more than one meeting consecutively.
Probability to happen:	Medium(25 - 50%)
Possible consequence:	Minor - Severe (Depends on the commitment relation and on the number of meetings missed)
Risk avoidance:	It is not avoidable in some cases, but in other cases if the team members feel that they are unique to the team and have a role to play, those members need to still be actively engaged.
Risk mitigation:	If the student misses more than two meetings, inform the TA and if they miss more than 3 meetings without any good excuse, inform the teachers.

Table 8. Risk 08 with medium probability and medium to severe consequences.

Unique Id: 08	**Created on: 11/02/2017**
Title	**Tasks/Activities delays**
Description	The individual tasks/activities are not delivered in time to be integrated with the others tasks/activities.
Probability to happen:	Medium (25 - 50%)
Possible Consequence:	Medium-Severe

Risk avoidance:	Deadline of tasks 2 days prior to the delivery day, if it doesn't have any other task depending on it. Try not to assign inter-depend tasks to different developers. Additionally, the scrum master should keep track of all tasks in development and the issues faced by the team members in order to try to solve it together with the task owner. If the problem carries on, a meeting should be organized to discuss and to try to solve it on a group level and afterwards, possibly on the TA level as well.
Risk mitigation:	Include this task/activity on the next sprint backlog.

Table 9. Risk 09 with medium probability and medium consequences.

Unique Id: 09	**Created on: 11/02/2017**
Title	**Hardware unavailability**
Description	If any element breaks, gets damaged, malfunctions, and/or is not available to be used in the project
Probability to happen:	Medium (25 - 50%)
Possible Consequence:	Medium
Risk avoidance:	It is not avoidable.
Risk mitigation:	Change the requirements.

Table 10. Risk 10 with low probability and severe consequences.

Unique Id: 10	**Created on: 11/02/2017**
Title	**Requirements change**
Description	If any changes of the requirements occur during the development process.
Probability to happen:	Low (<25%)
Possible consequence:	Severe
Risk avoidance:	Requirements ought to be well described, analyzed and discussed with the stakeholders at the beginning and on every sprint planning meeting.
Risk mitigation:	Do the estimation of this new requirement, ask the stakeholders about its priority, include it on the product backlog and see if it is possible to deliver all of it or if the team will need to take out something. Inform the stakeholders about any new addition and verify if it is appropriate to add it.

Table 11. Risk 11 with low probability and medium consequences.

Unique Id: 11	**Created on: 11/02/2017**
Title	**Lack of communication**
Description	Students that do not access Slack daily and miss the information available there.
Probability to happen:	Low (<25%)
Possible consequence:	Medium
Risk avoidance:	Engage team members to use the communication tool chosen.
Risk mitigation:	Make stand-up meetings to keep track of the information and the current task progress.

Table 12. Risk 12 with low probability and minor to medium consequences.

Unique Id: 12	**Created on: 11/02/2017**
Title	**A developer leaves the project course**
Description	Students that choose to leave the program and/or the course during the development process of the project.
Probability to happen:	Low (<25%)
Possible consequence:	Minor - Medium (Depends on the commitment relation)
Risk avoidance:	It is not avoidable, but in order to decrease the possibility for this to happen, a better commitment of the team members and distribution of the tasks is needed.
Risk mitigation:	Reduce the sprint backlog and depending on which phase it occur in, reduce the requirements number.

Table 13. Risk 13 with low probability and minor to medium consequences.

Unique Id:13	**Created on: 11/02/2017**
Title	**A developer gets sick**
Description	Students get sick during the development process for a long period.

Probability to happen:	Low (<25%)
Possible consequence:	Minor - Medium (Depends on the commitment relation)
Risk avoidance:	It is not avoidable.
Risk mitigation:	Reduce the sprint backlog and depending on how long it continues, reduce the requirements number.

Table 14. Risk 14 with low probability and minor consequences.

Unique Id: 14	**Created on: 11/02/2017**
Title	**Computers/Softwares underperformance**
Description	The chosen tools and/or the computers do not perform as expected, fail or stop working.
Probability to happen:	Low (<25%)
Possible consequence:	Minor
Risk avoidance:	It is not avoidable.
Risk mitigation:	Try to fix and/or reinstall as soon as possible, work with pair programming practice until the problem is fixed.

Table 15. Risk 01 with high probability and severe consequences.

Unique Id: 01	**Updated on: 01/05/2017**
Title	**Unfamiliar languages**
Description	The students have no knowledge of languages other than Java.
Probability to happen:	High (>50%)
Possible consequence:	Severe
Risk avoidance:	It is not avoidable.
Risk mitigation:	Dedicate a time slot to educate the team on the skills they will need. Turn to the TAs and other students for additional guidance.

Table 16. Risk 05 with high probability and severe consequences.

Unique Id: 05	**Updated on: 01/05/2017**

Title	**Car hardware problems**
Description	The Arduino or any other car component does not function properly.
Probability to happen:	High (>50%)
Possible consequence:	Severe
Risk avoidance:	It is not avoidable.
Risk mitigation:	Ask the TAs for assistance.

Table 17. Risk 13 with high probability and severe consequences.

Unique Id:13	**Updated on: 01/05/2017**
Title	**A developer gets sick**
Description	Students get sick during the development process for a long period.
Probability to happen:	High (> 50%)
Possible consequence:	Severe
Risk avoidance:	It is not avoidable.
Risk mitigation:	Reduce the sprint backlog and depending on how long it continues, reduce the requirements number.

Table 18. Risk 14 with high probability and severe consequences.

Unique Id: 14	**Updated on: 01/05/2017**
Title	**Computers/Softwares underperformance**
Description	The chosen tools and/or the computers do not perform as expected, fail or stop working.
Probability to happen:	High (>50%)
Possible consequence:	Severe
Risk avoidance:	It is not avoidable.
Risk mitigation:	Try to fix and/or reinstall as soon as possible, work with pair programming practice until the problem is fixed.

Table 19. Risk 08 with high probability and medium to severe consequences.

Unique Id: 08	**Updated on: 01/05/2017**
Title	**Tasks/Activities delays**
Description	The individual tasks/activities are not delivered in time to be integrated with the others tasks/activities.
Probability to happen:	High (>50%)
Possible Consequence:	Medium-Severe
Risk avoidance:	Deadline of tasks 2 days prior to the delivery day, if it doesn't have any other task depending on it. Try not to assign inter-depend tasks to different developers. Additionally, the scrum master should keep track of all tasks in development and the issues faced by the team members in order to try to solve it together with the task owner. If the problem carries on, a meeting should be organized to discuss and to try to solve it on a group level and afterwards, possibly on the TA level as well.
Risk mitigation:	Include this task/activity on the next sprint backlog.

Table 20. Risk 02 with medium probability and severe consequences.

Unique Id: 02	**Updated on: 01/05/2017**
Title	**A developer has lack of key skills**
Description	The students don't have necessary knowledge to work on the tasks assigned.
Probability to happen:	Medium (25 - 50%)
Possible consequence:	Severe
Risk avoidance:	Ask for help from other team members or TAs and try to learn. Try to keep the activities related to the skills each team member has.
Risk mitigation:	Use pair programming to equally distribute the skills availability.

Table 21. Risk 09 with medium probability and severe consequences.

Unique Id: 09	**Updated on: 01/05/2017**
Title	**Hardware unavailability**
Description	If any element breaks, gets damaged, malfunctions, and/or is not available to be used in the project
Probability to happen:	Medium (25 - 50%)

Possible Consequence:	Severe
Risk avoidance:	It is not avoidable.
Risk mitigation:	Change the requirements.

Table 22. Risk 03 with medium probability and medium consequences.

Unique Id: 03	**Updated on: 01/05/2017**
Title	**Size underestimate**
Description	The size of a feature, functionality and task has been underestimated.
Probability to happen:	Medium (25 - 50%)
Possible consequence:	Medium
Risk avoidance:	Playing risk poker to estimate the user stories can lead us to a more accurate estimation. Afterwards, create subtasks for each user story and estimate as well. The sum of these subtasks estimation should be the final estimation for the related user story.
Risk mitigation:	Reduce the sprint backlog and depending on how long it takes, reduce the requirements number.

Table 23. Risk 10 with medium probability and medium to severe consequences.

Unique Id: 10	**Updated on: 01/05/2017**
Title	**Requirements change**
Description	If any changes of the requirements occur during the development process.
Probability to happen:	Medium (25 - 50%) - High (>50%)
Possible consequence:	Medium - Severe
Risk avoidance:	Requirements ought to be well described, analyzed and discussed with the stakeholders at the beginning and on every sprint planning meeting.
Risk mitigation:	Do the estimation of this new requirement, ask the stakeholders about its priority, include it on the product backlog and see if it is possible to deliver all of it or if the team will need to take out something. Inform the stakeholders about any new addition and verify if it is appropriate to add it.

Table 24. Risk 07 with medium probability and minor to medium consequences.

Unique Id: 07	**Updated on: 01/05/2017**
Title	**A developer misses meetings**
Description	Students that for any reason miss more than one meeting consecutively.
Probability to happen:	Medium (25 - 50%)
Possible consequence:	Minor - Medium (Depends on the commitment relation and on the number of meetings missed)
Risk avoidance:	It is not avoidable in some cases, but in other cases if the team members feel that they are unique to the team and have a role to play, those members need to still be actively engaged.
Risk mitigation:	If the student misses more than two meetings, inform the TA and if they miss more than 3 meetings without any good excuse, inform the teachers.

Table 25. Risk 06 with low probability and medium consequences.

Unique Id: 06	**Updated on: 01/05/2017**
Title	**A developer is not committed to the project**
Description	A developer does not take part in the project in some of the phases.
Probability to happen:	Low (<25%)
Possible consequence:	Medium
Risk avoidance:	It is not avoidable.
Risk mitigation:	Have a meeting where the group can talk with each other; if this does not show results, talk with the TAs and teachers.

Table 26. Risk 11 with low probability and minor to medium consequences.

Unique Id: 11	**Updated on: 01/05/2017**
Title	**Lack of communication**
Description	Students that do not access Slack daily and miss the information available there.

Probability to happen:	Low (<25%)
Possible consequence:	Minor - Medium
Risk avoidance:	Engage team members to use the communication tool chosen.
Risk mitigation:	Make stand-up meetings to keep track of the information and the current task progress.

Table 27. Risk 04 closed.

Unique Id: 04	**Updated on: 01/05/2017**
Title	**Multiple Stakeholders**
Description	More than one stakeholder was identified for the project, having that in consideration, different people can have different expectations about the same product feature.
Probability to happen:	Closed
Possible consequence:	Closed

Table 28. Risk 12 closed.

Unique Id: 12	**Updated on: 01/05/2017**
Title	**A developer leaves the project course**
Description	Students that choose to leave the program and/or the course during the development process of the project.
Probability to happen:	Closed
Possible consequence:	Closed