

## Collaborative Discussion: IS Failure

### Feedback to Colleague Solomon Kanihiro's Post

OOIS x

Objec x

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Apps Properties Mamz... UnionBank Login New Tab

Update

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Module Resources

e-Portfolio

Codio

eBook

Unit 1


Unit 2

Unit 3

Unit 4

Unit 5

« Collaborative Discussion 1: Information System Failure



Solomon Kanihiro

Initial post

69 days ago

5 replies

Last 44 days ago

In an effort to improve the payroll system in 2006, the Queensland Health in Australia selected IBM Australia for the project in 2007. With a budget of \$6 Million dollars and an estimated project timeline of six months to the commissioning of the system. However, the project did not go live until 2010 with additional costs totaling to over \$25 million in addition to \$1.15 billion over a span of 8 years to pay staff that had to do part of the payroll work manually (Paterno et al, 2018: 246).

The information system failure was attributed to;

Investigations showed that the procurement processes had a lot of irregularities among which included favoritism going towards IBM despite there bid not being the most qualified. This was highly attributed to the fact that one of there former staff members working in Queensland Health was giving them insider information (Paterno et al, 2018: 246).

Poor project consultations on scope before work was started were also highlighted, the scope of work and processes in place were not understood clearly before work commenced (Hawksworth,2010).

Reply

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Update

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Participants

Grades

Module Home

Tutor Office

Deadline Details

Seminars

Module Resources

e-Portfolio

Codio

eBook

Unit 1

Unit 2

Unit 3

Unit 4

Unit 5

System deployment was done albeit comprehensive tests and checks to ensure that it would serve its intended purpose. This was highlighted by the fact that about 35000 bugs were reported in its first months of deployment (Henrico,2019).

References :

Paterno, P. and Zhao, S. (2018) 'Queensland Health: Australia's Healthcare IT Catastrophe', Proceedings of the Northeast Business & Economics Association, pp. 245–248. Available at: <http://0-search.ebscohost.com.serlib0.essex.ac.uk/login.aspx?direct=true&db=bsu&AN=134109961&site=eds-live> (Accessed: 09 May 2021)


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Henrico,D. (2019) Case Study 9: The Payroll System That Cost Queensland Health AU\$1.25 Billion. Available from: <https://www.henricodolfig.com/2019/12/project-failure-case-study-queensland-health.html> [Accessed 11 May 2021]

Reply

5 replies

1



Post by Sergio Rafael Zavarec Caldera

Peer response

68 days ago

It seems this is a good example of how to do everything wrong. The healthcare authority was slow to audit and keep track of progress, which brings the first big problem: governance. According to



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Apps Properties | Mamz... UnionBank Login New Tab

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OOIS\_PCOM7E May 2021

Participants

Grades

Module Home

Tutor Office

Deadline Details

Seminars

Module Resources

e-Portfolio

Codio

eBook

Unit 1

Unit 2

Unit 3

Unit 4

Unit 5

One interesting aspect of the inquiry board's report is that there seems to be no single technical misstep that can be blamed for the destruction of the vehicle. From the software engineering perspective, there was a data conversion error from a 64-bit floating point to a 16-bit signed integer value. On the system design level, incorrect exception handling led to the shutdown of the properly functioning IRS processor along with its backup unit. Known as a "single point of failure", this design flaw has no place in critical systems such as IRS and could have absolutely been avoided. From the requirements analysis perspective, the change of the launch environment was not properly accounted for, resulting in alignment code developed for Ariane 4 remaining operational in Ariane 5. Finally, the lack of adequate acceptance testing and external review of the project code and documentation, along with poor engineering collaboration and unclear responsibilities, all contributed to the eventual disaster (Nuseibeh, 1997).

It can be said that, in the case of Ariane 5, the failure of an information system stemmed from a combination of factors, with the "human element" once again playing a prominent role. And while these kinds of failures might be considered inevitable or even, in a sense, normal (Sommerville, 2013), it is still distressing to see how a series of essentially avoidable mistakes led to such disastrous consequences.

References

Furniss, T. (1996) Untested software is blamed for failure of Ariane 5 launch. Available from: <https://flightglobal.com/untested-software-is-blamed-for-failure-of-ariane-5-launch/6283.article> [Accessed 10 May 2021].

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Le Lann, G. (1997) 'An analysis of the Ariane 5 flight 501 failure-a system engineering perspective', *International Conference and Workshop on Engineering of Computer-Based Systems*. Monterey, 24-28 March. New York: IEEE. 339-346.

Nuseibeh, B. (1997) Ariane 5: Who Dunnit? *IEEE Software* 14(3): 11-65.

Sommerville, I. (2013) Critical systems engineering. Available from: <https://iansommerville.com/systems-software-and-technology/static/courses/critical-systems-engineering/> [Accessed 10 May 2021].

The European Space Agency (1996) N° 33-1996: Ariane 501 - Presentation of Inquiry Board report. Available from:

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Kikelomo Obayemi

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OOIS\_PCOM7E May 2021

Participants

Grades

Module Home

Tutor Office

Deadline Details

Seminars

Module Resources

e-Portfolio

Codio

eBook

Unit 1

Unit 2

Unit 3

Unit 4

Unit 5

1

Post by Kikelomo Obayemi

Peer Response

71 days ago

Hello Andrey,

This is an interesting case study with a lot of learning points. According to the ESA (1996), the software design error could have been mitigated by allowing the system to continue to compute its best estimates of the required information rather than converting a 64-bit variable to 16-bit which eventually resulted in an overflow. To worsen the situation, there was no exception handler to handle this conversion error.

The designers of Ariane 5 created a system where a single component failure caused the entire system to fail. As a rule, single point of failure should be avoided in critical system designs (Anon, 2014).

References

Anon (2014) Ariane 5 launcher failure – why did it happen, Available from: <https://www.slideshare.net/software-engineering-book/ariane5failure-pres>. [Accessed 11 May 2021]

The European Space Agency (1996) N° 33-1996: Ariane 501 - Presentation of Inquiry Board report. Available from: [https://esa.int/Newsroom/Press\\_Releases/Ariane\\_501\\_-\\_Presentation\\_of\\_Inquiry\\_Board\\_report](https://esa.int/Newsroom/Press_Releases/Ariane_501_-_Presentation_of_Inquiry_Board_report) [Accessed 11 May 2021].

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Kikelomo Obayemi