PA1308 Self Study Package - Architecture Evaluation

Indira Nurdiani
Blekinge Institute of Technology
SE-371 79 Karlskrona SWEDEN
inu@bth.se

August 30, 2012

Abstract

In this study package you'll learn which options you have to evaluate a software architecture.

1 Architecture Evaluation

Why?
There are many reasons for conducting a software architecture evaluation. Name and describe as many reasons as you can find (at least four).
Hints: See [3] part three, [6] chapter 2, and [10]

What?
What aspects should you evaluate in architecture evaluation process? Why?
Hints: See [3], part three, [6] section 3.3.4., and [5] chapter 2

How?
Name, at least, three different architecture evaluation methods? Do they fundamentally differ in how the evaluation is performed? In what way?
Hints: See [3], part three, [6], chapter 3, and [5, 7, 9]

Which?
What would be the basis of choosing the appropriate architecture evaluation method? Use a specific system and a specific context, so that you have the purpose of the evaluation clear to you.
Hints: See [6], section 3.4 and 5.3, and [1]

With what?
What are the pre-requisites to a successful architecture evaluation? Why?
Hints: See [6], section 4.1, [3], part three, and [12]

When?
When would you perform architecture evaluation? You may associate the outcome to a certain software system and architecture evaluation method.
Hints: See [3], part three, [6], section 5.2, and See [2]

Quality Attributes
How would you have to document your quality attributes in order to enable evaluation of them? How would you document their implementation? Which documentation techniques or views would you select to ensure that quality attributes can be assessed? Why?
Hints: See [3], part three

Outcomes
What are the expected outcomes of architecture evaluation? Expected outcome may include artifacts, or some decision-making related. Would you expect different types of outcomes for different software systems? For different architecture evaluation methods? How would the outcomes differ?
Hints: See [3], chapter 11 and chapter 12, [10], [5] section 2.7, and [4]

For whom, for what?
Who should get the results of your architecture evaluation? What can you and they do with the evaluation result? How would you need it documented in order to do this?
Hints: See [4]

2 Advanced Concepts

Agile and Architecture
Agile/Lean software methodology is gaining interest from practitioners. Yet, Agile/Lean method is often considered to be on collision course with software architectures, since Agile/Lean is focused on emergent requirements and design, and also minimal documentation. How would you perform architecture evaluation in Agile teams?
Hints: See [8, 9, 11]

3 Further Reading

For further reading, see [2, 8–11].

References

[1] Software architecture | tools & methods | evaluating the architecture | tools and methods for evaluating the architecture. http://www.sei.cmu.edu/architecture/tools/evaluate/?location=tertiary-nav&source=17153, 2012.

[2] M.A. Babar, L. Zhu, and R. Jeffery. A framework for classifying and comparing software architecture evaluation methods. In *Software Engineering Conference, 2004. Proceedings. 2004 Australian*, pages 309 – 318, 2004.

[3] Len Bass, Paul Clements, and Rick Kazman. *Software Architecture in Practice*. Addison-Wesley Professional, 2003.

[4] J. Bosch and P. Molin. Software architecture design: evaluation and transformation. In *Engineering of Computer-Based Systems, 1999. Proceedings. ECBS '99. IEEE Conference and Workshop on*, pages 4 –10, March 1999.

[5] Paul Clements, Rick Kazman, and Mark H. Klein. Evaluating software architectures : Methods and case studies. Technical report, 2002.

[6] Paul Clements, Rick Kazman, Linda Northrop, Amy Zaremski, Gregory Abowd, and Len Bass. Recommended best industrial practice for software architecture evaluation. CMU/SEI-96-TR-025, January 1997.

[7] L. Dobrica and E. Niemela. A survey on software architecture analysis methods. *Software Engineering, IEEE Transactions on*, 28(7):638 – 653, July 2002.

[8] S. Farhan, H. Tauseef, and M.A. Fahiem. Adding agility to architecture tradeoff analysis method for mapping on crystal. In *WRI World Congress on Software Engineering, 2009. WCSE '09*, volume 4, pages 121 –125, May 2009.

[9] F. Kanwal, K. Junaid, and M.A. Fahiem. A hybrid software architecture evaluation method for FDD - an agile process model. In *2010 International Conference on Computational Intelligence and Software Engineering (CiSE)*, pages 1 –5, December 2010.

[10] J.F. Maranzano, S.A. Rozsypal, G.H. Zimmerman, G.W. Warnken, P.E. Wirth, and D.M. Weiss. Architecture reviews: practice and experience. *IEEE Software*, 22(2):34 – 43, April 2005.

[11] R.L. Nord and J.E. Tomayko. Software architecture-centric methods and agile development. *IEEE Software*, 23(2):47 – 53, April 2006.

[12] M. Svahnberg and F. Mårtensson. Six years of evaluating software architectures in student projects. *The Journal of Systems & Software*, 80(11):1893–1901, 2007.