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Testing @ Domains -

How does Finance, Automotive,
Medical etc test?

Do we have to take care of the domains?

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Conferences Special

Testing @ Domains, and the winner is

by Erik van Veenendaal

“Risk is the possibility of an undesired outcome. Risks exist whenever some problem may occur which would decrease customer, user, participant, or stakeholder perceptions of product quality or project success. Risk is often perceived as a value that would vary depending on the circumstance or the perspective. Risk is what is taken when balancing the likelihood of an event vs. the impact if it actually happens. In effect what are we willing to leave to chance? In most cases the level of risk the business is willing to take is dependent on the amount of time and available budget. At a closer look risk-based testing is highly related to the concept of good enough testing. Good enough testing reflects what we do in real life where something less than a “perfect” solution is inevitable. The good enough paradigm is helpful to understanding the risk-based test approach. It provides a mental framework for the (release) decision-making in projects where risks are being taken.”

I started this column with an excerpt from an upcoming book on product risk management since the differences in testing between in the various domains should be driven by the different levels of risk of the systems being developed in the various domains. We can discuss the differences for hours, days or weeks, but testing is performed for a reason. It is performed to mitigate product risks. A system that has safety risks (e.g., a medical sys-

tem) should be tested more thoroughly than a system that “only” has financial risks (e.g., a banking system); a system that only has financial risks should be tested more thoroughly than an internal logistics system etc. Although we all agree with these statements, is this what it looks like in the real world as well? Even when a medical system is being tested, there is pressure to deliver on-time and beat the competition. Will a business manager at an insurance company accept less thorough testing (compared to a medical system) since there is only a financial risk?

With over 25 years of practical experiences in the software industry, I have worked in many different organizations in various domains. I have also run many courses over the years, both public and in-house, and have discussed how testing is performed in their organization with a many participants. I too believe there are many differences for many reasons, the risk level of the system under test being probably the most important one. Do we have data to substantiate our subjective feeling?

Knowledge and skills of the test professional

Over the years I have kept track of the pass rates on ISTQB Advanced and ISEB Practitioner. Out of interest I organized the data

Erik van Veenendaal
Jan Jaap Cannegieter



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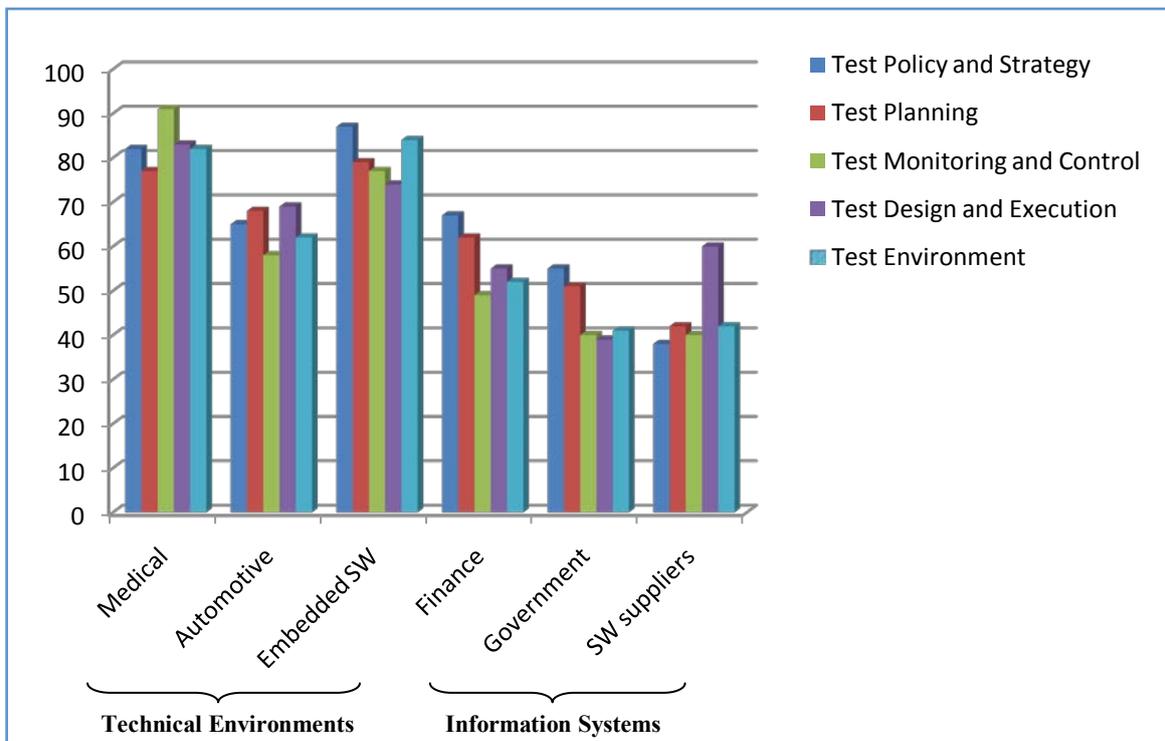
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Graph 1: Test maturity in the domains

such that it allows for a distinction between test professionals working in a more technical environment, where usually multi-disciplinary products are being developed (e.g., automotive, medical, embedded software, mobile), and those working in a more office type environment where database oriented information systems are being developed (e.g., banking, insurance, government, trading). Surprisingly (or not?) the pass rate for test professionals working in a more technical environment comes out almost 20% higher! Having worked in both types of environment, I'm not too surprised, but it does make you think

Tools uptake

Recently, I published a paper on the results of a tool survey [1] in which the same distinction between technical environments and database oriented information systems is made. A general tendency in tool uptake is that in the area of technical environments substantially more tools are available and applied than in the area of information systems. This is true for most types of tool. Some striking examples are shown in the table.

Test tools implementation ratio ¹	Technical Environments	Information Systems
Requirements management	29%	9%
Configuration management	76%	39%
Static analysis	47%	12%
Coverage measurement tools	21%	4%
Dynamic analysis tooling	34%	7%
Performance tools (incl. load/stress)	40%	27%

Table 1: Tool uptake in the domains

For some tool types the fact that the uptake is much lower for information systems can be explained by the fact that fewer tools

¹ Implementation ratio is defined as the number of organizations using a certain test tool divided by the total number surveyed.

are available for the languages they are using. The difference in tool uptake perhaps also relates to a more professional way of doing software engineering and component testing in technical environments. The differences in uptake with tools such as dynamic analysis, coverage measurement and static analysis seems to be an indicator for this. However, doing a detailed analysis is not the objective here. Again, a substantial difference between the domains, it does make you think

Test maturity

Finally I have tried to gather data on the average test maturity in the domains using the TMMi framework as a reference model. TMMi is rapidly becoming the world-wide standard for measuring and benchmarking test maturity. Together with some friendly organizations that also perform formal and informal assessments, I managed to get the data from several dozens of TMMi assessments. The graph hereafter shows the average ratings (scale 0 – 100) for some domains in the TMMi maturity level 2 process areas.

A graph that is very interesting to analyze and discuss more in detail. But again, we notice a substantial difference between the technical environments and the information system environments. In my view, the product risks (e.g., safety, reliability, and cost of recall) of the medical, automotive and embedded software industry drive the organizations towards a more thorough test process. Note that this does imply that agile software development and exploratory testing and the like are not practiced in technical environments. On the contrary, and when practiced, they even seem to be more successful!

Finally...

What does all of this mean? “To measure is to know.” It is good to have an awareness on the differences that were discussed. From various perspectives it seems some domains clearly have a higher test capability. This is reassuring, since I would like my car to stop when I use the brake, my TV set not to reboot during a soccer

match and, of course, to receive the right radiation doses when being medically examined. If you want to improve your testing, benchmarking is often a good idea; however, you may want to have a look at domains that are in the premier league of testing. Some of their fully deployed practices could also be beneficial to you. When someone presents a new idea at a testing conference and presents the results based on an internet application or in the Microsoft world, I'm not always fully convinced. Please also show me how it performs in a more advanced, challenging and critical environment!

Note that the column is about testing in the various domains in general. There are many organizations that will perform a lot better or (sadly) a lot worse than the domain average. Where are you?

[1] E. Van Veenendaal, Tools and the last six years, in: Professional Tester, November 2010

> biography



Erik van Veenendaal (www.erikvanveenendaal.nl) is a leading international consultant and trainer, and a widely recognized expert in the area of software testing and quality management with over 20 years of practical testing experiences. He is the founder of Improve Quality Services BV (www.improveqs.nl). At EuroStar 1999, 2002 and 2005, he was awarded the best tutorial presentation. In 2007 he received the European Testing Excellence Award for his contribution to the testing profession over the years. He has been working as a test manager and consultant in various domains for more than 20 years. He has written numerous papers and a number of books, including "The Testing Practitioner", "ISTQB Foundations of Software Testing" and "Testing according to TMap". Erik is also a former part-time senior lecturer at the Eindhoven University of Technology, vice-president of the International Software Testing Qualifications Board (2005–2009) and currently vice chair of the TMMi Foundation.

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