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Test Techniques in practice -

Do they help?
Why do we often test without them?

Personnel evaluation based on tests

by Andrey Konushin

It can be asserted that software testing as an independent technological discipline appeared in the natural evolution of program engineering knowledge. Russia, with a noticeable lag, repeats processes which are taking place in West. America, for example, has already realized the need for "independent testing". Over time, western specialists have begun to treat quality problems with much more responsibility. After years of evolution, testing had been transformed into a rather structured technological process that requires not only human resources, but also special software and hardware which cannot be assumed as available to every company. Apart from that, testing is a specific science that requires specific qualifications. The experience is that in Russia today such qualifications are rarely taken. Even in the West there are not many educational institutions that teach testing. In Russia they are absent. And not every programmer is able to become a good tester [1].

In the Russian provinces the situation with personnel selection is much more difficult than in the larger cities. This is principally the result of low standards, the evolution of the testing branch and a lack of teaching organizations. In spite of this, there are periodical seminars and trainings for software testers, all of which are in part non-standard because the trainers lead the seminars using their own subjective program. Thus when selecting the personnel in these provincial areas department leaders are faced with the question of how to evaluate an employee when he/she has no experience or knowledge in testing. Not only is the current qualification level of the candidate important here, but also his/her professional status. Having experience means you can teach employees based on your own strengths. A personal evaluation which can be assessed in all testing areas can help here. However, such evaluations at this stage only provide a way to obtain information about a candidate. Evaluation of this data is still an expert task with low levels of formalization. Results depend on the experience and professional instincts of the test manager.

Suppose that a recently hired employee has no knowledge in testing or the knowledge is not systematic and based purely on previous experience. This can result in problems in teaching this employee.

The International Software Testing Qualifications Board (ISTQB) is now just starting to pick up speed in Russia and is set to become one the main trends in the training and certification of software testers. Training programs are independent from vendors. More than 120 professionals in software testing from all over the world took part in the development of syllabi, which gives them a high level of reliability. Apart from that, the syllabi are international and generally accepted: they exist in more than 20 countries and several tens of thousands of specialists are certified [2]. The certification scheme provides qualification based on exams.

There is a good reason to evaluate personnel periodically. Moreover, evaluations need to be processed for both the new and existing testers. World trends show that evaluation is assumed to be in the form of exams [3]. A properly constructed exam permits an objective evaluation of qualification levels shown as a quantitative ratio. It is a laborious task to conduct such exams; maybe even more laborious than an expert assessment of qualification levels. But exams have an advantage: they can be applied more than once and to multiple employees concurrently. This can save precious manager's time, as shown by the following calculations.

Assume that expert evaluation and exam evaluation give the same result – objective knowledge of the employee's qualification level.

Time spent on expert evaluation equals the time spent on evaluation by exam.

The formulas are based on the assumption that employees are rated on an hourly basis. The time spent by an examiner on performing direct tasks and the time spent on references cost the same.

Expert evaluation cost:

$$EC_E = \sum_0^{N_T} (R_E + R_T),$$

where - cost of expert hour of personnel evaluation work, - cost of examiner hour of work, - number of testers being evaluated.

Test evaluation cost:

$$EC_T = R_E + \sum_0^{N_T} R_T,$$

where - cost of exam development by expert, - cost of examiner hour of work, - number of testers being evaluated.

Suppose that a testing department consists of 10 testers. Evaluation is held twice a year. The cost of examiner work is 14 €. The cost of an expert is 22 € per hour. Evaluation of one employee takes 1 hour in both variants considered. The expert is able to develop an exam in 5 hours.

$$EC_E = \sum_0^{10}(22+14) = 10*36 = 360\,EUR$$

$$EC_T = 5*22 + \sum_0^{10}14 = 110+140 = 250\,EUR$$

Of course, results processing should be automated as much as possible. The time spent on automation is not taken into account in the formulas shown above. It is possible to assume that automation consists of the elementary report on the number of correct and incorrect answers. If we assume that one exam can be used twice (e.g. twice a year or two exams alternating over two years) and evaluation is needed twice a year, then we have the following results per year.

$$EC_E = 2*\sum_0^{10}(22+14) = 2*10*36 = 720\,EUR$$

$$EC_T = 5*22 + 2*\sum_0^{10}14 = 110+280 = 390\,EUR$$

Thus, with some assumptions, calculations show that the most effective method of evaluation is exams, other conditions being equal. In this article a software testing department is considered. However, it is easy to see that these calculations are applicable to different key industries that face the problem of evaluation of personnel.

1. "CIO" magazine №10, 19.12.2002, http://www.cio-world.ru/offline/2002/9/22721/
2. International Software Quality Specialists Certification Scheme, A. Konushin, V. Vershinin, Contemporary problems of economics and new research technologies: interuniversity collection of proceedings. Part 1 / VZFI Vladimir Branch. – Vladimir, 2006. ISBN 5-93350-126-3
3. Personnel evaluation methods, http://www.management.com.ua/hrm/hrm029.html

Biography

25 years old. Specialist in software testing. ISTQB Certified Tester, Advanced Level.

Master of techniques and technologies in informatics and computer engineering, Vladimir State University, Russia.

Since 2004: Test Manager of Inreco LAN, a software development company (http://inrecolan.com). His main research interests include information management and system analysis both in software testing and related fields.

Since 2006: Lecturer of Information Systems & Information Management chair of Vladimir State University. In 2008 Andrey developed and implemented the "Software testing" course for the University based on ISTQB Syllabus.

Andrey is one of the founders of the Russian Software Testing Qualifications Board. Since 2006 he is the President of RSTQB.