

Effective ways of teaching Software Testing

Authors:

Saiprasad Nagarajan
Rathna Naga

Intuit Technologies Services (P) Ltd.
7th Floor, Campus 4A, Pritech park,
Belandur, Bangalore – 560 103
www.intuit.com

Saiprasad_Nagarajan@intuit.com
Rathna_Naga@intuit.com

Abstract

Software Testing is one of the few areas which will rule the IT industry in general owing to great products and services being developed and consumed in the market that demands high quality. According to Gartner, it will become a 1 Billion dollar industry by 2010 and 10 Billion few years from now. One of the key challenges, the industry facing is talented and skilled resources who can solve this supply demand problem. India being a populous country, getting people is not an issue, the issue lies in converting those people to get attracted towards software testing domain and motivating them to valuable contributors is a herculean task. Our paper entitled "*Effective ways of teaching Software Testing*" will address this issue to measurable extent where we had achieved great success through innovative software testing teaching methodologies.

A Career in Software testing is not so popular among new entrants to the IT industry despite software testing has made tremendous progress in recent years in many areas like tools, technologies and processes. What lacks is the awareness about this great and challenging career one can aspire? Things will become simple when testing experts from different backgrounds and domains can share their expertise and experience internally and externally. This is possible only through teaching software testing in a way where a person with any background can take it and deliver it.

In our organization, we have adopted some of the best teaching practices in software testing through which we have achieved great success. Basically we believe in "*Learn Teach Learn*" methodology where we teach what we have learnt in our experience and the dos and don'ts and learnings and key take aways. We have adopted this teaching methodology with best practices in many areas like demos, training sessions, brown bags, book clubs, knowledge sharing sessions, whitespace, developing tools, training people on domain, tools, processes and technologies using CDI and TDI right from concepts till the delivery of the product to our customers and end users who have witnessed great quality products than in the past with less resources but great productivity and return on investment.

Keywords: Testing, Teaching, Effective

1.0 Software Testing Career - an Industry Perspective

Day by day software products are getting bigger in size and complexity. At the same time, profit margins are under tremendous pressure due to increased competition. Besides, high quality products and timely delivery are demanded by every customer.

Testing function, many a times is perceived as a conflicting role with that of developers and inferior choice to make it as a career option in one's life. India emerged as the preferred destination for software development and testing. India will account for 8\$ billion market opportunity of the estimated 13 billion global software testing market. Hence in order to meet this demand, it is highly significant to recruit talented and self-motivated test professionals who can meet the demands of a tomorrow's test organization.

There is an absolute need for paradigm shift in the way software testing as a career is perceived in the industry. Testing is no more a substitute or inferior with that of development. It is equally challenging and demanding requiring skills, knowledge, experience and expertise in various areas like processes, tools, techniques, methodologies, quality models, technologies and domain that are required to test the evolving complex products.

Many Organizations, Universities and Training institutes have realized the scarcity of testing professionals in the market and started taking measures towards teaching software testing. Software testing is introduced as a subject in colleges and to some extent trainings are being conducted to increase the awareness of software testing among budding IT professionals.

“The key to winning today and to creating an organization that can win again tomorrow is teaching. If you look at the world's best leaders, they are also the world's best teachers. Teaching is at the heart of leadership”

2.0 Challenges of pursuing Software testing as a Career

In order to meet the demand of the global testing market, many organizations are making attempts realizing this tremendous growth opportunity. Many of them started creating awareness about the software testing as a whole and teaching it effectively in their own way in order to attract the talented people available in the market facilitating them to consider software testing as a career.

There are lots of challenges that come as an obstacle, organizations has to face in meeting the market demands. Even though the challenges are many, there are few challenges that

are common across the software companies irrespective of the fact that they deliver products to customers or service their clients.

Challenges:

- Lack of Awareness about Software Testing.
- Dearth of Quality Testing Professionals.
- Changing the Fresher's mindsets.
- Teaching Software Testing techniques as a part of the Curriculum.
- Retaining existing testing professionals.
- Setting Career Development for testing professionals.
- Organizational Focus towards Software Testing.

4. Teaching Methodologies - An Industry Perspective

In order to overcome the challenges, organizations are adopting some of the widely accepted teaching methodologies to retain existing talent and motivate them to perform better and also attracting new talent outside.

4.1. Teaching Objectives:

- Benchmark their own testing practices, methodologies and processes against leading companies and keep improving.
- Fully Develop their own teachable points of view, encompassing
 - Ideas about the testing environment and their company's internal core testing capabilities.
 - How these ideas fit together into what satisfy customer's changing requirements and high quality expectations, which determines how company can make money and win customer's heart creating wow experience in the marketplace.
 - Operational values that will help them implement their innovative ideas that might improve the existing processes, tools and implementation producing great performance improvement yielding high ROI .

- Methods of energizing the workforce both one-on- one and with large-scale mechanisms.
- The ways that tough decisions about leveraging resources, skills, experience and individual career development are made.
- Create a compelling story about where their organization is going that can engage people at all levels.
- Examine how world-class test experts develop test experts: Improve their own ability to coach and develop test experts by setting an example of “learn teach learn” methodology.

Below are the different ways that were instrumental in driving the teaching efforts of software testing and achieving the above stated teaching objectives.

4.1.1. Knowledge Sharing Sessions:

"Wisdom is Knowledge and Knowledge is information and information is incomplete and meaningless when it is not shared ". "Learning through experience is better than experience through learning".

This is a forum where seasoned test professionals will share their past testing experiences and expertise providing a way of guidance to the budding professionals to make use of their rich knowledge and experience instead of re-inventing the wheel.

4.1.2. Certifications:

Having been certified will help the budding professionals to know the essence of testing and its applicability in the real world and thereby increase their productivity.

The following are the benefits of industry acclaimed and renowned certifications like CSTE, CSQA and CSTP in the field of software testing.

- Rapid implementation of an independent, skilled testing function and a measurable improvement in skills in an existing testing function.
- Adoption of an industry set of best practices without the need for extensive research and learning.
- Reduced post-release risks (through improved pre-release testing).
- Increased visibility to critical defects earlier in the development cycle.
- Protection of their strategic and tactical IT development and deployment plans

through more effective pre-release testing capability.

4.1.3. Conferences/Seminars/Paper Presentations:

This provides a great opportunity for us to showcase our industry experiences in terms of challenges we faced while using tools or following some processes and key values and benefits we incurred while implementing testing practices or working with latest technologies. Besides it creates a visibility for oneself and the company we work for increasing brand value and image across various software companies and testing communities in the IT Industry.

In order to constantly encourage this activity and the participants, we as a company sponsor conferences. Also, we encourage the participants who have attended the conferences to share their experiences and deliver presentations about any new learnings and common mistakes providing way for continuous learning.

Some of the leading conferences include QAI, STePin, Steputo and so on.

4.1.4. Mailing Lists:

Mailing list is a great way of sharing information across groups, Since people with different skill levels are involved and publish and subscribe model of Mailing lists will give opportunities to learn and relearn.

4.1.5. Processes:

Process is one of the key success factors in a project. Instead of following a particular process across various projects in the company, we follow process that is project specific. In this way, people get exposure and experience to different processes being adopted thereby getting hands on widely used processes which might be useful in future projects.

Some of the processes include *TSP/PSP, Agile, Scrum, Release Train*

4.1.6. Trainings:

Past experience and knowledge can be handy and beneficial for a certain period after which it becomes obsolete. As we move towards next generation technologies, tools and processes, one has to stay connected and keep up-to-date in different areas of testing w.r.t technology, tools, processes which can facilitate them to work confidently and produce great impact within short span of time.

Organizations should encourage soft skills trainings like Communication skills, Interviewing skills and others which are very much essential to recruit the people with the right mindset and right skill set.

5. Intuit's Success Story towards teaching software testing effectively

To get ahead and stay ahead companies need agile, flexible people who can anticipate change and respond instantly to new realities. And, they need them throughout the organization. That's why it's important to invest the time in teaching software testing to improve one's testing abilities and capabilities to learn to test effectively and efficiently the product from scratch and deliver high quality products staying in touch with the latest technologies, tools and processes employed in the software testing cycle.

We have adopted a novel way of teaching software testing by inculcating the art and science of software testing as a part of day-to day life where awareness of software testing is prevalent through sharing of information in various forms in various forums.

Apart from incorporating the above widely used teaching methodologies, Intuit has some unique methodologies, which have helped Intuit become very successful; some of them are as below.

5.1.1 Technical Forums:

Monthly Presentations : This is a monthly event which opens up a wide array of opportunities for demos, presentations, walkthroughs on various topics in different quality tracks like metrics, automation, process, tools, best practices and so on.

BrownBag Sessions: This is a weekly event which is a common forum for both development and testing community to come and share their knowledge across the wider audience. This forum reiterates the fact that testing function is being treated on par with development.

Book Clubs: This is a weekly event where a particular topic will be discussed chapter wise. In this event, everyone gets an opportunity to read the chapter by themselves and present it to the audience and gets the doubts/clarifications cleared.

5.1.2. Innovation:

Apart from regular testing activities, we do encourage people to innovate and come up their innovative ideas that will reduce the testing efforts, increase productivity yielding ROI and high product quality. We have different forums that drive the innovation spirit among the test professionals.

White space projects:

Employees are encouraged to work on the ideas which help individual and business to grow and increase customer satisfaction. Ideas can develop in to a new product, process, tool, etc.

Hactivism: This is a Bi –Annual event within the entire company across geographical location to encourage the innovative ideas of engineers. This event provides an opportunity for engineers to present their ideas in a presentation or as a prototype or as a demo reaching the wider audience and producing a greater impact on their ideas being presented.

CTOF: This is an annual event within the company where people are encouraged to write an abstract of an idea that might become the potential business offering for the company. The idea can be a process improvement, methodology, new approach/solution to existing problem or an innovative solution that doesn't exist or in general anything that can delight the customer. This event also helps one to showcase their talent and gain visibility to the leadership and top management team who are instrumental in taking one's great idea to the next stage of creating products deriving mutual benefits.

Patents: Patents help companies with new business opportunity thereby increasing the company revenues and individual visibility.

5.1.3. Customer and Product Awareness:

We make it a point for all new entrants to the testing function to be aware of the target customer , the product offerings before getting into the actual testing phase. This activity facilitates one to have a better understanding of the customer and the product thereby encouraging one to test better and deliver high quality products.

CDI: This program provides an opportunity to visit the call centers who support our products. Participating in this program will provide a different perspective of how the product is being used by the end customer paving way for different approach to product development and testing.

TDI: This program provides an opportunity to improve the technology rather use the right technology to deliver products that are easy to use, simple and provide value add for the customer. This helps one to revisit the technology and solution being implemented and adopt right development and subsequent testing approach for the need of the hour rather than assumptions and presumptions.

QB Challenge: This is a 2 day event where the people are encouraged to participate and learn the product having a first-hand experience of that of a customer installing, configuring the product and making it ready for use. This helps one to visualize and see for oneself how difficult or easy for the customer to work with the product and is an eye-opener for developers and test professionals to develop the product that customer finds it easy to use ,learn and operate to do their daily business rather than figuring out how to work with the product in order to do their daily tasks.

QB User Certification: This certification helps one to understand the technical know-how of the product and the target user base for which it is being used.

Bug –O-Rama: This event is organized internally before the major release of the product to the customer. This is a one day event where people who haven't developed or tested that feature will be invited to test the feature as it provides an opportunity to improve lateral thinking and test from a different angle yielding several defects, thus producing high quality product. Participating in this program provides an opportunity to learn new feature that people haven't worked or aware of.

5.1.4. Infrastructure:

Intuit has an unique test infrastructure to integrate with another engineering site to handle different testing projects . This infrastructure means having

1. Autolab setup, where testing and development teams across engineering sites can make use of available test machines to perform their intended tasks.
2. On-Demand task scheduling, where one can schedule their intended tasks remotely
3. Task builder, where one can create tasks to reproduce issues or some critical testing or triaging build related issues
4. DBTs – a provision for developers to do unit tests for each build before it is sent to testing team.

Hence, knowledge of the above infrastructure is mandatory for budding professionals and this has been made part of the agenda during New Hire Orientation.

5.1.5. Boot Camp/New Hire Orientation:

This event for all new hires in the company and provides an overview of the company, products and the organization structure and responsibilities

Apart from this, Intuit has 3 months intensive and comprehensive training program for new Hires. This program also covers basics of software testing and how different testing tools, techniques, processes are being effectively used and implemented in different projects across various projects within the company. This program helps one to correlate theory and practical meaning of software testing.

6. Conclusion

As the importance of teaching testing and its rewarding career prospects is increasingly being realized across all software companies, the above methodologies discussed will be of greater acceptance especially to the people who are interested in pursuing a career in the IT industry.

The companies irrespective of their organization, hierarchy, domain, technology, products or services they are into, can still be benefited in terms of the above methodologies discussed which might create a new perspective and a new dimension to pursuing software testing as a career in their organization. Efforts are being taken in our company to teach the art and science of software testing effectively and efficiently in order to build a high performing test teams on par with software development and deliver high quality products working collaboratively as “*Teams Work*” philosophy . The teaching methodologies and principles are an indication of beginning of creating successful remote test infrastructure for tomorrow which is a continuous journey with emphasis on continuous improvement and test process optimization which will identify the challenges much earlier than at later stages.

7. References

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8. Biography

Saiprasad N has 7+ years of experience in software testing with significant experience in manual and automation testing using Client Server and Web Technologies. Presently working @ Intuit Technology Services Pvt. Ltd. Prior to Intuit, worked with organizations like McAfee, HCL Technologies and Zensar Technologies in various domains like security, telecom and investment banking.

His areas of interests are Usability testing , Knowledge Management & Domain Expertise

Rathna N has 8+ yrs of professional experience in QA & Testing. Presently a Senior Software Engineer - QA at Intuit Technology Services Pvt. Ltd., Before joining Intuit she has worked with reputed organizations like Novell ,webMethods (now Software AG), Bangalore,

She has experience in Component and Integration testing of various projects (ActiveX Controls, Java Beans for Novell Services, Perl and PHP for NetWare .. etc) and testing webMethods Siebel Adapter, Web Services Testing.

Her areas of Interests are Test Design, Execution, Automation Design and Implementation & Test metrics gathering.

9. Keywords

CDI: Customer Driven Innovation

TDI: Technology Driven Innovation

CTOF: Create The Offering

COE: Centre of Excellence

BU: Business Unit

TCOE: Test Center of Excellence

QB: Quick Books

TSP: Team Software Process

PSP: Personal Software Process