$$(e^2)^Q + p = P$$

e = efficiency

e = effectiveness

Q = quality

p = process

P = Productivity

Six Thinking Hats to Differentiate Your Testing Skills

By Malini Mohan Kumar

In today's world, testing a complex business application requires a variety of skills and the ability to think differently. A talented tester will wear many hats. A few hats will be specialized while many hats will be multi dimensional. Testers who consciously expand their thinking process are sure to become successful software testing professionals.

How can testers increase the effectiveness of their thinking process? How can we ensure our thinking is diversified? Edward de Bono's brainchild on thinking performance, "Six Thinking Hats", is one possible solution. Tremendous results can be achieved by optimizing one's thinking.

An Introduction to the Six Thinking Hats

Six Thinking Hats, as Edward de Bono puts it, is a simple and effective parallel thinking process. This concept advocates the use of parallel thinking over the traditional critical, sometimes adversarial thinking. The conventional adversarial thinking is most often aimed eliminating ideas and creativity, and lacks constructive energy. Parallel thinking, on the other hand, is a kind of thinking in which each thinker keeps his thought parallel to those of other thinkers and at no instance attacks others' ideas and thoughts.

The Six Thinking Hats concept helps to minimize the confusion in thinking that arises mainly because of the way human brain usually thinks; taking into consideration emotions, facts, creativity, hope, and logic all at once. This concept helps a thinker to take up these elements of thinking one at a time, thereby simplifying thoughts and making solutions more approachable. The term "Hat" is used primarily to benefit from already existing association of many cultures to the phrase "Thinking Hat" i.e., a certain kind of thinking that can be put on or off.

Edward de Bono defines six different types of hats; each denotes a different way of looking at thinking.

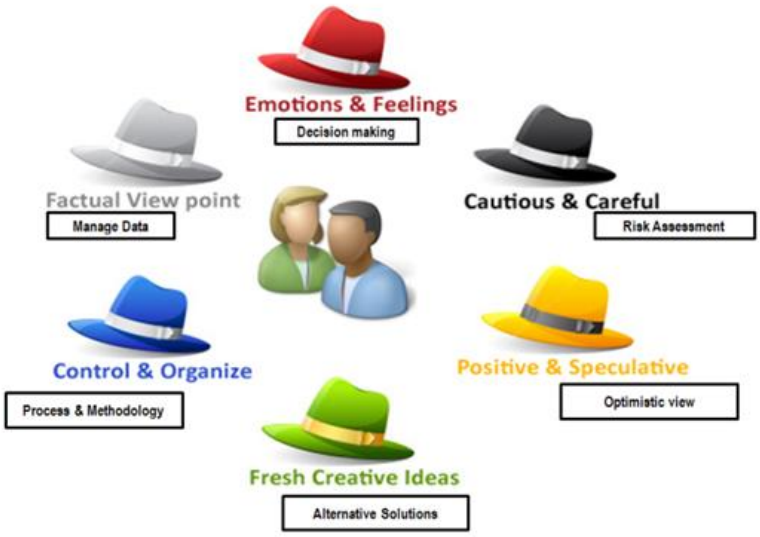

Figure 1 - Six Thinking Hats by Edward de Bono

Software Testing and Thinking Skills

The emergence of Edward de Bono's Six Thinking Hats is an innovation that software testing can reap rich benefits from. The primary reason is that the concept optimizes a key resource required for testing - "Thinking". Effective thinking indeed forms the basis of effective testing as is evident from some of the important activities in software testing - Test Planning, Test design, and Test Execution. These are skilled activities that require the ability to think, explore and follow logic, while questioning and reasoning at the same time.

The Six Thinking Hats of Testing

The Six Thinking Hats by Edward de Bono can be evolved to apply to the many aspects of the testing effort. The model becomes the Six Thinking Hats of Testing. The Six Thinking Hats of Testing can be implemented for the individual tester or by the collective test team. The following table provides an outline of thinking perspectives under each hat.

Hat	Testing Related Thinking Skills
	**Blue Hat Skill: Control and Organize the Process and Methodology** • Understand the problem statement and define the process • Maintain Focus on business specifications and requirements • Control on product delivery schedules and time management plan • Identify the software risk issues and contingency planning • Budget evaluation and control • Monitoring the progress • Develop action plan for next steps, roles, responsibilities, time • Focus on continuous improvement and learning from previous experience
	**White Hat Skill: Factual View Point** • Concentrate more on obtaining and finding facts and figures • Manage all test data and trouble reporting • Clear test design and development • Maintain the range of accuracy in your deliverables • Plan to get necessary data • Clear idea about the facts needed and how to obtain them
	**Green Hat Skill: Provide Fresh Alternatives Without Criticism** • Creative approach to solve issues • Generate fresh new ideas and alternative possibilities to bring effective solutions • Generate random & creative ideas to trouble shoot and fix the issue • Allow space for creative thinking to test in different angle • Mitigate and assess all kind of risks with fresh/new solutions
	**Yellow Hat Skill: Positive and Speculative, Benefits with Rationale** • Constructive thinking and encouragement • Identifying feasibility • Find the competitive advantage. • Find the sense of potential

	• Find the best possible outcome
	**Black Hat Skill: Cautious and Careful Risk Assessment** • Concentrate on what can go wrong • Find errors in logic • Identify the risks and problems
	**Red Hat Skill: Emotions and Feelings** • Keep in check the range of feelings and emotions • Take proper decision making • Generate ideas • Improve the level of commitment • Allow for gut feelings • Have a check on real sense

An example of using the Six Thinking Hats of Testing by a test team would be in designing the test plan. When test planning the team meets and discusses the key data points and composes the plan together. This is where Six Thinking Hats method can be most effective. Begin with the test plan owner wearing the blue hat and thereby owning the outcome of the test plan meeting. The meeting will be divided into sections allowing the participants to wear each of the different hats. One section of the meeting could be discussing the software risk and contingency planning. It is most practical to start this discussion with everyone wearing a Black hat. While exploring the software risks, it is important to ask for people's feelings and emotional views of the topic. This generally brings out some of the less commonly considered risks. After exhausting the thinking process under the Black hat, the Blue hat owner instructs the team to switch to Red hat. Everyone in the group would then give relevant Red hat input. The key here is that the whole group is focused on only one type of thinking at any given time, thereby lessening wasted time and team distractions due to the difference of opinions and arguments. This example gives insight into how each section of the test plan can be covered comprehensively by thinking in all directions.

An example of using the Six Thinking Hats of Testing by the individual tester would be during test execution. Consider a tester involved in Exploratory Testing. While testing application functionality, a tester can split available time into different time-boxes and assign each time-box to a particular hat, thereby ensuring that the software is tested from each thinking perspective.

Mapping Test Types to Testing Skill Hats

Another way to use the Six Thinking Hats of Testing technique is to map the hats to different types of testing. The following is a sampling of the testing skill hats that may be used depending on the types of testing identified in the test strategy.

- Positive Testing – Yellow Hat - Ensuring all the basic expected functionalities are working with positive test cases. Concentrating more on working functionality.
- Negative Testing or RBT (Risk based testing) - Black and Yellow Hats - Addresses and mitigates the possible risks in the application.
- Integration Testing – Blue Hat - Ensures all the requirements covered.

- Regression Testing – Black Hat – Ensures all the fixed bugs are not impacting other part of the application and to reduce the chances of old bugs reappearing.
- White Box Testing – White Hat – Ensures the effectiveness of the code.
- Context-Driven or Exploratory Testing – Green Hat – Testing is based on context, which tends to be an iterative, evolving, creative process.
- Ad Hoc Testing – Green and Red Hats - Fresh ideas for finding bugs.

Benefits for Applying the Six Thinking Hats of Testing

The quality of thinking is the greatest asset in a software tester. The role of a software tester is to find a vast variety of errors in a software application. By wearing different hats and applying each hat's thinking technique, the tester will develop more effective test strategies, find a greater degree of defects, and assist the project in more reliably delivering on time with quality.

The Six Thinking Hats of Testing method can also help teams facilitate group thinking while diversifying individual thinking. It can ensure improved planning, gain greater test coverage, timely detection of bugs, and enhancing the overall effectiveness of testing just by optimizing one's thinking. The Six Thinking Hats of Testing concept can help the testing team minimize confusion and simplify decision making and identifying solutions.

Conclusion

Most of the time testers are concerned with "Test coverage". The Six Thinking Hats of Testing technique, can be a powerful tool for testers when test planning, identifying test coverage, with timely detection of bugs, and enhancing the overall effectiveness of testing effort simply by optimizing one's thinking and virtually without any additional cost. With six different ways to approach our testing this provides a powerful approach to improving the outcome of our testing.

About the Author

Malini resides in India and has over 10 years of experience in IT including development, testing and project management. Her passion is in advancing the profession of software testing and she is active within the software testing industry. Malini participates in public forums such as NASSCOM, STEP-IN-Forum, QAI Forum and HYSEA, and her technical articles and white papers have been published. She holds an MBA in IT and a GNIIT diploma. Read more from Malini on her blog at http://malinimohankumar.blogspot.com.