Innovation Division
The Global Voice of Quality™

ASQ Innovation Division

THE EHANG 184, AN AUTONOMOUS ONE-PERSON TAXI COMING TO DUBAI IN JULY 2017

February 2017

IN ISSUE #4

Notes from the Chair

by Jane Keathley, ASQ Innovation Division Chair

The Innovation Division is now in its third year, having come up through the ASQ ranks from Technical Committee to Interest Group to full-on Division in Jan 2015. I thank all of you for your support along the way and for your membership now. We have a big year in store – I want to share our key strategies:

- **Educational Webinar series** – our Education Chair, **Jose Valdivia**, is putting together a slate of speakers and cutting edge topics, some in collaboration with other member units, which will advance your knowledge in the area of innovation. Be sure to watch for the invitations and get these on your schedules – you won't be sorry. These sessions are also recorded and posted on our YouTube channel – see Jose's update elsewhere in this newsletter.

- **Attend ASQ's World Conference for Quality & Improvement (WCQI),** Charlotte, NC, May 1-3, 2017 – The Division will be hosting Booth 817 in the Exhibit Hall – please come see us if you're there! **Tracy Owens** is organizing the booth and we'll need help with it, so please volunteer if you can. And don't miss **Peter Merrill**, our sponsored speaker, on Wednesday, May 3. Peter will talk about business models for innovation and Lean Start-Up.

- **PAR Innovation Award** – the Division continues to manage the PAR Innovation Award program, along with the ASQ PAR Committee, coordinating judges' selection and training, the application review cycle, and feedback reports to applicants. This program gives member units an opportunity to share their innovative successes and be recognized for their efforts.

- **5th Annual Innovation Conference** – Oct 13-15 2017 in Dayton OH. This year's innovation conference promises to be even more stimulating than last year's. Block your calendar for this event, consider submitting a presentation, and look for more information from Conference Chair **Tracy Owens** later in this newsletter.

- **Body of Knowledge** – **Jim Nelson** has joined forces with **Kateri Brunell** on our Quality BoK subcommittee. We continue to support the overall ASQ QBoK initiative as we focus on providing you with useful materials on innovation and value creation.

- **ISO TAG 279** – several members of our division are currently serving on ISO's standard development committee for Innovation Management.

These are just some of the highlights of our coming year. Please take advantage of these opportunities and let me know what else you'd like to see the Division offer. And **there's always room for more volunteers** – we need help in several areas and the benefits of getting involved far outweigh the effort required!

CONTENTS

For Unsolvable Problems, Use TRIZ

by H. James Harrington

Many organizations have struggled with an improvement opportunity for months (or even years) and still not been able to define an acceptable solution. Often these seemingly unsolvable problems would open the door to major new markets and greatly improve profit.

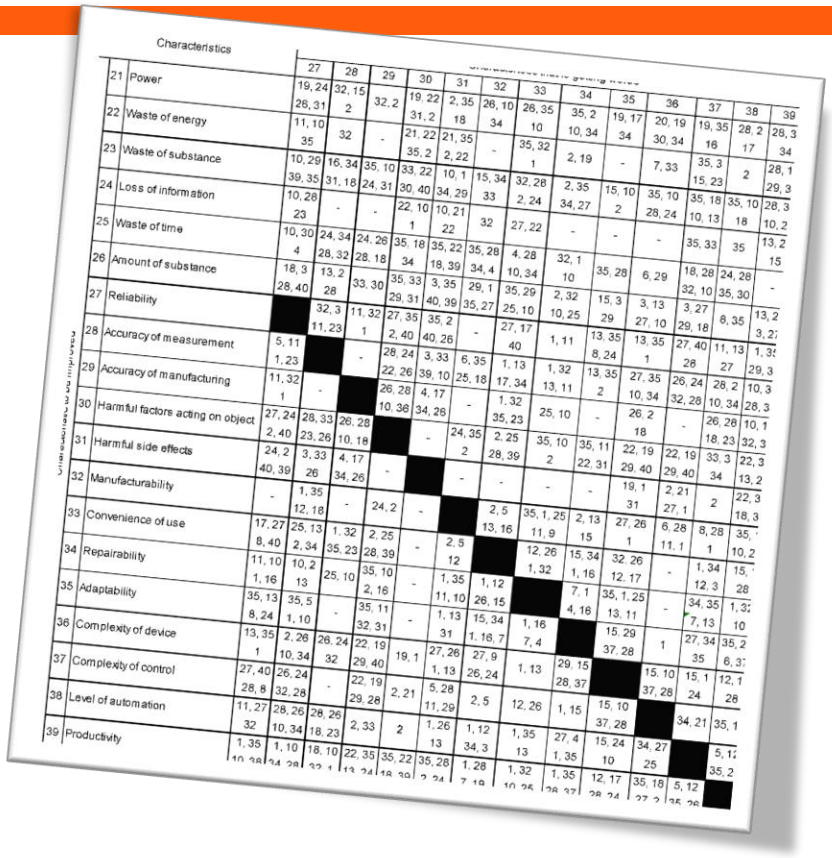
During the 1940s, a Russian named Genrich Altshuller directed his research to understanding how engineering systems have evolved over time. After reviewing more than 40,000 patents, the result of this study was a theoretical-based approach known as "Patterns of Evolution of Technological Systems." Most of the world calls it **TRIZ**. One of Altshuller's conclusions was that problems for which there were no known means of solving (Inventive Problems) involve one or more *contradictions*. He believed that if an engineer could define the contradictions and solve one or more of them, the system would advance to the next step in the evolutionary course (or "Contradiction Analysis"). This led Altshuller to develop the "Laws of System Evolution," which are the foundations of TRIZ.

Two tables form the foundation that much of the TRIZ activity is based on. They are:

• **The 40 TRIZ Principles** – 40 statements that describe approaches to resolving technical conflict that were defined by Altshuller. Trained logical thinkers use the 40 TRIZ Principles as a set of patterns of inventions or operators applicable with all fields of study

• **The 39 Characteristics of Technical Systems** for expressing contradictions.

In 1998, the Altshuller family established the Altshuller Institute for TRIZ Studies in Boston. The mission of the Altshuller Institute is to grow productivity and innovation with TRIZ. Application of TRIZ methods to medicine, agriculture, manufacturing and management can spur innovation and improve the human condition.



On January 1, I completed two years as President of the Altshuller Institute. (The current president is Isak Bukhman.) The Altshuller Institute is a group of about 130 individuals dedicated to promoting TRIZ. The Altshuller Institute has a number of "TRIZ Masters" managing or providing direction to the key activities within the organization. The Altshuller Institute provides:

Institute Certification

The Altshuller Institute has developed a TRIZ certification program to ensure the integrity of the TRIZ process and the competency of the candidates who have met the rigorous requirements of certification at various levels. Earning a certification from the Altshuller Institute indicates that the candidate has satisfied curriculum requirements and as passed a comprehensive test. This process ensures that certified Altshuller Institute candidates are competent to produce results at levels of achievement.

Workshops

• 3-Day TRIZ Introductory Workshop
The first level Workshop is a 3-Day TRIZ Introductory Workshop with Associate Certification exam. The Associate Workshop is for those individuals looking to learn the basics of TRIZ and develop a working knowledge of how to use TRIZ in the world. Participants should read some TRIZ materials and be ready for a rigorous workshop to get them ready to take the AI Associate's exam.

• Advanced TRIZ Workshop
The second level workshop is Advanced TRIZ for people wishing to prepare to become certified as a TRIZ Practitioner. During the 24 hours of training, these individuals build upon the initial skills developed during their Associate training. Topics include: Brief Review of Basic TRIZ Material, Su-Field Modeling and Analysis, System of Standard Solutions, ARIZ-85C Overview and Creative Imagination Development.

Annual Technical Conference - TRIZCON

This annual technical conference attracts TRIZ Masters from around the world and is widely attended by individual participants who are interested in gaining more knowledge related to TRIZ.

Technical presentations

The Altshuller Institute provides competent individuals to make presentations at conferences and dinner meetings. There is no charge for the speaker but usually the inviting organization pays for his or her traveling expenses. Many of the individuals in this group have proven that unsolvable problems are solvable using the TRIZ methodology.

Our members are anxious to share their knowledge with you and universities throughout the world as they have members in Asia, Europe, and the Americas.

Innovation Division Keeps Fresh Ideas Rolling: A Call for Volunteers!

Volunteer for the ASQ Innovation Division! We saved a seat for you.

Now in our third year as an ASQ Division, we've been able to attract volunteer member leaders with a wide range of experience and leadership in innovation management. Our 2017 officer and committee chairs are listed to the right.

And the best news is… we have room for **YOU** on the member leader team! Whether you are looking to volunteer for a committee chair position to learn more and demonstrate leadership on the topic of innovation management and advance your ASQ profile, or if you only have the time and the appetite for a program or event that takes place once per year, all of our members can benefit from your thoughtful participation.

INNOVATION DIVISION 2017 OFFICER AND COMMITTEE CHAIRS:

- 2017 Chair – Jane Keathley
- Chair Elect – Tracy Owens
- Secretary – Laura Kavanaugh
- Treasurer – Tammy D'Alto
- Audit Chair – Vincent Miller
- Education Chair - José Valdivia
- Newsletter – Nicole Radziwill
- Nominations – Ian Meggarrey
- QboK – Jim Nelson, Kateri Brunell
- TCC Liaison – Peter Marshall
- VOC Chair – Kymm Hockman
- Internet Liaison – Lesley Morgan
- YQP Liaison – Will LaFollette
- Membership Chair - **OPEN**

WEBINAR: Statisticians as Innovation Leaders (with ASQ Statistics Division)

Thursday, February 23rd at 12:00PM-1:00PM EST by **Kymm Hockman,** Innovation Process Champion, DuPont Electronics & Communications.

Innovation leading to business growth is increasingly important. In this presentation, we discuss the unique roles that statistics and statisticians can play in facilitating and leading innovation efforts. Data-based decision making, systems thinking, an independent perspective and the ability to influence others all work together to equip and position the statistician to lead growth project work to successful commercial success. Examples from real statistician-led projects will illustrate the role of statistics in making wise commercialization decisions, plus recommendations on how the statistics field needs to broaden the skill base to prepare innovation leaders of the future. **REGISTER NOW**: https://attendee.gotowebinar.com/register/5418952232864458755

Attend ASQ's World Conference for Quality & Improvement (WCQI)

Charlotte, NC, May 1-3, 2017

The Division will be hosting **Booth 817** in the Exhibit Hall – please come see us if you're there! **Tracy Owens** is organizing the booth and we'll need help with it, so please volunteer if you can. And don't miss **Peter Merrill**, our sponsored speaker, on Wednesday, May 3. Peter will talk about business models for innovation and Lean Start-Up.

You are also invited to our **Division Membership Meeting** on Tuesday, May 2, 5:30-6:30, location TBD.

Save the Date: 5th Annual ASQ Innovation Conference will be held October 13-15, 2017 in Dayton, OH

Come join us at the LexisNexis Campus & Surrounding Area. Proudly hosted by the ASQ Innovation Division (http://asq.org/innovation-group/) and the ASQ Dayton Section (http://asqdayton.org)

ASQ Dayton Section
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Innovation Planning Using Non-Traditional Methods (Part 2)

by Jane Keathley

"You need to plan the way a fire department plans. It cannot anticipate fires, so it has to shape a flexible organization that is capable of responding to unpredictable events."- Andy Grove (Intel)

The execution phase – a crucial part of successful innovation – relies on good project management. You can help increase your success rate for innovation by adapting traditional methodologies in some key areas (see Part 1 of this article, from the November 2016 Innovation Division Newsletter):

- Active focus on the value proposition
- Alternative scheduling mechanisms
- Efficient change management practices

Applying these adaptations to reinvent your planning for business, strategies, projects, and quality is the topic of this article.

The Innovation Business Plan

The business plan traditionally describes the concept for a business idea, the target customer base, and the expected timeline (e.g., 3 to 5 years). Business risks and financial estimates are included. The plan is directed to financiers and is most likely based on untested assumptions. Once financing is obtained, the business plan is shelved and forgotten.

Business planning for innovation must be more effective, and Lean Start-Up (LSU) by Eric Ries offers one such approach. Ries noted the 'waste' inherent in many business plans, including his own failed start-ups. His approach removes the waste and shortens the time from business concept to marketable deliverable.

The LSU method assumes good management oversight; however, it recognizes that innovative initiatives are highly unpredictable with little basis for accurate forecasts. The method focuses on rapid cycle times, continuous customer involvement, and a scientific approach to decision-making.

Beginning with the Minimum Viable Product, testing with customers is conducted with a pre-determined 'hypothesis' and measurable criteria, resulting in empirical evidence of the product's appeal and business potential. Adjustments (major or minor) are made and the process repeated. This 'Build-Measure-Learn' cycle allows progress along the most efficient pathway, providing a steering process that reduces time wasted on non-viable alternatives.

Management oversight ensures that riskiest assumptions are tested first and acceptance criteria are adjusted when necessary. For example, wide tolerances or big losses may be acceptable early on, then tightened as more prediction accuracy improves.

This is hard work, but well worth the effort. LSU has been successfully applied to a number of start-up businesses, such as SnapTax (Intuit), and LSU chapters and online communities are available to support LSU practitioners.

Innovation & the Strategy Plan

Organizational strategy plans are typically an annual exercise to review strategic objectives and future direction. The value is often in the discussions themselves, with the Strategic Plan filed away. Keeping the strategy plan visible helps focus the organization on the desired objectives, which can be very helpful for innovative strategies. A business model canvas approach such as the one shown here (Figure 1; Osterwalder) summarizes and displays the organization's key strategic elements. Lean Canvas and other niche canvases have evolved since the original canvas.

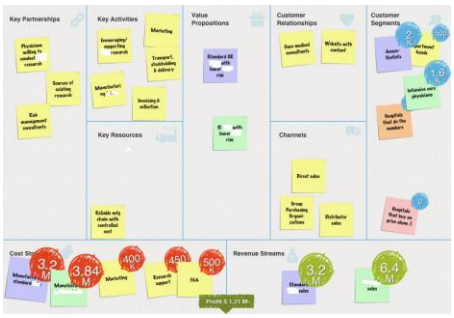

Figure 1: The Business Model Canvas (Osterwalder, 2010)

The core of the Business Model Canvas is the value proposition – which describes the opportunities and the innovative solutions planned. Other elements of the strategy are laid out, including potential market segments, competitive situation, metrics, and financial estimates. The information is displayed on one sheet that is kept – physically or electronically – in a location easily visualized and modified quickly.

Innovation Project Planning

Project planning has a well-defined methodology and is successfully practiced across industries worldwide. Standard elements include the scope, work breakdown structure, schedule, and change management. The focus is on deliverables that meet requirements, on time and in budget.

Agile methods are rapidly gaining on traditional project planning for innovation projects. Agile planning defines and schedules the work to be done in short project iterations. The focus is on features or outcomes that can be completed within fixed time and cost units, allowing more flexibility, rapid changes and adjustments when needed, and higher quality outcomes as issues are addressed real-time.

Figure 2: Kanban Board (Atlassian, 2016)

Communication in agile projects requires that all project team members be tuned into frequent project updates, shifting priorities, and new or removed tasks. Traditional project plans may store up this information till the weekly or monthly team meeting; for innovation, things must move more rapidly.

Kanban, initially developed as an inventory flow methodology, can be used to manage the throughput of project tasks and keep innovation project team members current (Figure 2). The system's highly visual nature allows teams to communicate easily on what work needs to be done and when.

Planning for Quality in Innovation

Quality plans traditionally define how a product's quality will be assured, citing standards and procedures, and specifying testing requirements and acceptance criteria. Without a critical evaluation to ensure efficiency as well as elimination of defects, the traditional quality plan may bog down the innovation process.

Scrum, a type of agile, builds quality into agile cycles, with testing and documentation done throughout. This parallel and continuous approach to testing reduces the overall risk by finding and addressing defects and issues earlier. Scrum relies on well-developed acceptance criteria, which provide an empirical basis for measuring quality, greater efficiency, and less costly change management.

Three levels of scrum testing are performed at different times in a project.

• Early feasibility testing, before or early in the project; this testing defines the need or pain point

• Functionality testing against requirements, conducted throughout agile development cycles

• Validation, involving customers or users to ensure their needs were met.

Take-Aways

Adapting our thinking about planning, and incorporating concepts that drive agility without loss of quality, can improve successful innovation and enhance our outcomes for our organizations.

References

Atlassian. (2016). https://www.atlassian.com/agile/kanban/

Keathley, J. (2016, November). Innovation Planning Using Non-Traditional Methods, Part 1. ASQ Innovation Division Newsletter.

Osterwalder, A. (2010). Business Model Generation: A Handbook for Visionaries, Game Changers, and Challengers. John Wiley & Sons, New York NY.

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Book Review: Designing for Situation Awareness: An Approach to User-Centered Design

by Dr. Nicole Radziwill

Although this book is a few years old, it should be required reading for any manager or executive faced with the challenge of understanding – and managing in the face of – complexity. Oriented between the engineering and business domains, the core concepts around which this book are organized are user-centered design (which is a cornerstone of Design for Six Sigma) and situation awareness (a concept that originated with the author). Situation awareness, which is presented as the key to successfully achieving user-centered design, is the ability to accurately capture and understand "a constantly evolving picture of the state of the environment."

Situation awareness (SA) has been used to design interfaces to complex environments like human-machine interfaces (HMIs) for process industries, critical infrastructure, and airplane cockpits. The approach seeks to organize technology around the user's goals and capabilities, to emphasize the way people process information and make decisions, and to result in interfaces and artifacts that ultimately keep the user in control Helping human participants feel (and be) informed in the midst of an ever-increasing avalanche of data and information, a characteristic of high environmental dynamism, is the goal. As a result, it is easy to see why SA might be useful beyond mission-critical interface design (such as for developing modern analytics dashboards).

Complexity is defined by four elements: the number of items in a system, the degree of interaction of those items, the system dynamics (or how parts of the system change in response to changes in other parts), and the predictability of those changes. This book addresses each of those elements according to three themes: understanding the human cognitive context, creating designs that keep the user in control, and evaluating the utility of those designs. Several case studies are included that successfully synthesize the contents into actionable examples. Ultimately, the book is very readable, and packed with value for both engineers and managers who care about designing to meet quality goals.

The three levels of Situation Awareness are:

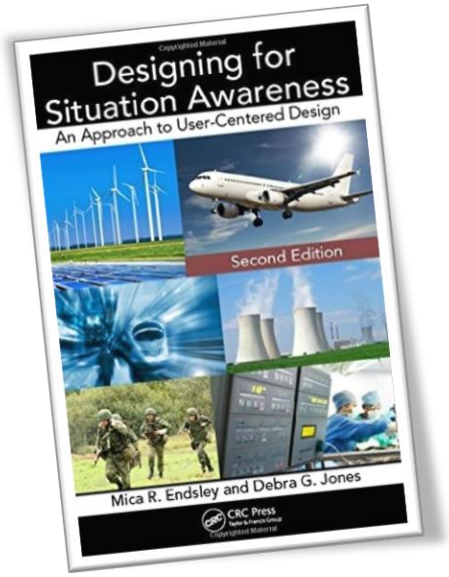
Perception (Level 1 SA) – understanding the information available to a human participant at any time in a process

Comprehensive (Level 2 SA) – synthesizing that information to form understanding

Projection (Level 3 SA) – extending that information in time to predict and understand future states

Examining a process from the SA perspective can help improve human factors at either the operations or design stages.

Designing for Situation Awareness: An Approach to User-Centered Design, 2nd Ed. 2012. Mica R. Endsley & Debra G. Jones. Boca Raton, FL: CRC Press. 370 pages.



VISIT US ON THE WEB!

Past Newsletters (including Part 1 of Jane Keathley's article from this issue), information resources, and conference presentations are available at:

http://asq.org/innovation-group