Problem Space Focus Before Solution Work
Day 1 Intro Workshop

Facilitator: Ron Lyells, Retired Honeywell

Assistant: Griselda Acosta, UTEP Student

Participants:

• Randy Anway	New Tapestry, LLC
• Mary Compton	Sandia National Labs
• Sergio De La Rosa	UTEP Student
• Rick Dove	Paradigm Shift International
• Heidi Hahn	Los Alamos National Lab
• Jim Larkin	MEI Technologies, AFRL Contractor
• Kerry Lunney	Thales Australia
• Oscar Mondragon	UTEP Professor

Problem Space Focus Before Solution Work

This Topic Conversation Deals With Widespread Chronic Behavior Where Teams, Organizations, Or Enterprises Move To Selecting A System Solution Before Actually Understanding What Problem They Are Trying To Solve

Some Things To Think About

Customer Problem Space

Solution Space

Culture

Decision Making

Product Development System

Learning

Cognitive Biases

Do You Really Understand?

Problem Space Focus Before Solution Work
Workshop Day 1 Discussion Notes

Jim: Wanted to drive SE for systems acquisition. People want solutions but they have their personal solution in mind. You have bias. Government politics. More incentive to risk take in private sector vs. government to hold their ground. Preconceived ideas held. Limiting for solutions. Exploring areas, that reduce work by shrinking trade space. Many technologies to come up with solution but no one knows TRL for xy or z. Culture is one thing. Incentive is carrot and stick issue. System is setup to rewind specific behavior. Instead of keeping focused instead of wide scope.

Kelly: Bounded by contracts. Customer is leaning to a specific solution. Will they share info with contractor the approach that arrived them to that conclusion. Your on a more material time. As project evolves you get a smoothing process vs. being boxed in by a contract. Customer has invested resources. Contractor comes with different view. Conflict is two different targets. Possibly client approached SE too late in process. Both entities arrive at same answers, customer then asks why did you do that we already knew that.

Rick: Problem does not exist until they see a solution. Problem space perception is in terms of solution.

Randall: Larger the project the more effects it has the more people involved. The bigger the project the more muddied the water gets. Connection between problem space and everything in it. It is the start to appreciate aspects of the problem space. Space? Social Space? Technical Space? Social contract we see issue lets solve it, but how s it defined tech, people, culture? It then cascades from there. Oscar: cultural problem that leads to an abusive practice. What is their motivation? Mission? (Perspective) Step to define problem space is never done. One is hired to do xyz, but seen as its done I'm done. Customer isn't asked what is needed to discover the actual need. Customer asks for what they want (they appear to want professional validation of their solution), but don't want to pay for what they really need.

Ron: Look out for yourself then your company. If no one is aware of real problem then everything will fail.

Mary: Wants better understanding of what system is to do but need better understanding study of why.

Randall: Fascinated by systems and systems thinking wants to develop working management systems analysis process of this person vs. this person. Trying to get better understanding. Sometimes you don't listen and signals get crossed.

Rick: Commercial system is need focused vs. government is contract based. Issue of not doing good problem based definition will change actual focus. Having track solution, instead of problem, getting a contractor engaged. You get I have this issue build it instead of help me figure out this problem. Software acquisition (Big changes) context is for grabs. We cant ask for requirements but capability instead guidelines are needed.

Heidi: Government vs. commercial federally funded entities they engage with customer. Lack of information sharing. Frustration sets in. Information gathering is initiated individually (sometimes) inept executives vs. user.

Kerry: Focus – Internal work instead of front office work. Typically a five year and path forward.

Heidi: One common denominator in every case had a solution already in mind. Customer wanted to hand them the solution. She wanted to help them evolve "their" solution impediment didn't have appreciation of what SE could bring to the table.

Rick: Have problem evolve. Have a better understanding of problem before you go into better discovery stage. Have to get people to realize from get go how that would help them in the long run.

Mary: They now have configuration management. Fast track wants as well. Boss asks questions of a finished product in case of future request for same system.

Ron: Who are customers for this potential solution. Who do you approach to develop solution.

Oscar: Contractors should be asked first. Customers obtain contractors to do a job that will not address the problem. Yet contractor suffers the most for lack of information. The one that is more capable to understanding the actual problem is the contractor.

Rick: Congress started to ask for innovative concepts for defense from the Defense Industrial Board (USA). Users finally said we need to write guidelines through the National Defense Industrial Association (NDIA).

Oscar: It took 50 years to realize bad practices.

Kerry: Little change since 2001.

Problem Space Focus Before Solution Work
Workshop Day 1 Discussion Notes – Continued

Ron: Theirs, fixers, choir.

Kerry: Even in defense experience various vastly.

Heidi: Program managers sell solutions to problems they don't fully understand.

Kelly: It's now more collaborative.

Kelly: Now looking where can I apply this elsewhere. Issue is problem space and platform is backwards.

Rick: People don't want to reuse what they've invested in.

Kelly: Bias's exist before problem space is even defined.

Jim: Reuse issue is a constraint in problem space. Organization that is larger than supplier, that they're thought though SE.

Kelly: Reuse is being use as organizational. It's needed to ensure that it used as intended to be wary of use for unintended use. Then ask is this the right solution.

Ron: A good reuse will not change modules architect. Idea of solution is a cognitive fixation (prediction) the x will fix y. Ask when is start when is end. When implementation is ready and built. Bet is it creates value over time. Overtime change to extract more value on prediction. There a social fixation that says yes we can do it. When world is constantly changing. Dynamics moves solutions and views of problems.

Rick: Figure out what tomorrow is going to focus on. Affordable. Effective. Solutions.

Topic: Problem Space Focus Before Solution Work – Day 1
Reception Poster

Need: The solutions we come up with don't always fit the intended application. Fully understanding the problem space, taking into account what ever solutions are available in the solution space.

Customers: Users, Contractors, acquirers, suppliers, research groups, Defense Industrial Board (USA), National Defense Industrial Association (NDIA).

Impediments to Focus On:

Degree of contract constraints.

Cultural (ability to share between acquirers, users, and research and development people.

Misapplied Reuse: Where existing solutions are applied to a new applications/problem space that is different than the original design intent.

General reuse in context of assumed knowledge of the problem/application environment.

Sales, marketing, PM organizations selling solutions prior to engineering involvement.

Problem Space Focus Before Solution Work
Day 2 Workshop Results

Day 2 Participants:

- **Ron Lyells**   **Retired Honeywell**

- **Randy Anway**   **New Tapestry, LLC**

- **Paul McGoey**   **Retired Boeing**

- **McKenna Gold**   **NMT Student**

Topic: Problem Space Focus Before Solution Work –Day 2

❑ **Problem Framing**

Need: The solutions we come up with don't always fit the intended application. Fully understanding the problem space, taking into account what ever solutions are available in the solution space.

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Impediments Discussed:

Cultural (ability to share between acquirers, users, and research and development people

Problem Space Focus Before Solution Work –Day 2

❑ **Solution Requirements**

- Has the value chain been reviewed in terms of competitive vs collaborative characteristics?

- Is the collaborative environment more inquiry based and aspirational?

- Is the competitive environment more transactional and positional based?

- Can individual business models be modified to allow sharing of user problem space and mission?

- Have predetermined problem space boundaries been identified?

- Has the value of doing problem space analysis been linked to the business model?

❑ **Next Steps**

- Identify working groups that have stake in this

- Contact working group leads to share this topic and these ideas and determine benefits of sharing with the entire working group population

Problem Space Focus Before Solution Work –Day 2

Notes:

- Companies acquiring innovation for purposes of "Deep Sixing" and "Defensive Acquisition"

- Companies large and small fall into patterns of behavior that are self beneficial in order for them to have a successful business model

- Competitive vs Collaborative design of the value chain

- Context and rules around transactions

- Collaborative environment is more inquiry based and aspirational

- Competitive environment is positional and transactional

- Problem Space Knowledge is power, it preserves know how and business model leverage

- A common pattern: Initial problem space inquiry begins and ends quickly with a bunch of unstated assumptions based on prior experience and practices. Which short circuits complete problem space understanding in light and consideration of new technologies and innovations.

- Rules and regulations focus on solution space and drive development team behavior to focus on the solution. Proper application of rules and regulations require good fundamental knowledge of the problem space.

- When changing and incorporating a problem space analysis into their work stream people in the value chain have to be willing to be in a prototype development environment

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