"My team was struggling to identify a good process to define business requirements for some new lab equipment. Within 6 weeks after we learned about idealized design from Jason Magidson, we had completed several sessions at 5 sites, generating hundreds of creative and original ideas from nearly 60 users. With just some minor additional categorizing and prioritizing, the result was a document that will be used by a selected vendor as the design basis for the new equipment. The biggest benefits from idealized design were to place some needed structure around the requirements gathering process, and to engage and provide a sense of ownership to a broad population of users."

Phil Waters, Investigator, Novel Analytical Technol. & Automation, GlaxoSmithKline R&D

Case Study of the use of "Idealized Design" to Generate Procurement Business Requirements and Innovation

This brief case study introduces "idealized design" and provides real-world results from when it was applied to business processes related to procurement at pharmaceuticals company GlaxoSmithKline.

The key feature of idealized design is that participants pretend that the process, system, product, etc. that they are designing was destroyed last night and they are starting from scratch and designing what they ideally want today if they could have whatever they wanted. Doing this frees people up to "think out of the box," unleashing creativity and generating momentum, buy-in, and consensus that support implementation of innovations and breakthroughs. In essence, participants start at the end – where they want to be – and then work backwards from there. This removes perceived obstacles and generates consensus and commitment on "how to get there."

During an idealized design session, the participants perform two main activities. They start by making a list of ideal "specifications" or characteristics of something they would like to create. Then, they begin creating a design that will bring about chosen specifications.

- *Generate "specifications."* A specification is a statement of a desired property or characteristic of a function, a process, or input. For example: "When using an elevator, if I push a button for the wrong floor, I could cancel it so the elevator wouldn't stop there" is a specification of desired functionality.
- *Develop a "design."* – A design is a structure and a process that will bring about one or more desired specifications. To continue the above example, a design to bring about the desired specification of canceling wrong floors on an elevator might be to develop "cancel" buttons that would be placed next to each of the floor buttons.

Lab Equipment Design -- Pharmaceutical Tablet Dissolution Testing Equipment

At GlaxoSmithKline, Jason Magidson engaged 60 scientists in designing dosage form dissolution testing equipment. This equipment is used for testing drug dosage forms (e.g., tablets) to see how they dissolve and release their medication into the body. This particular equipment simulates the human digestive system – the stomach and intestines. It contains

clear “vessels” that look a bit like lab beakers and are the size of the stomach. These vessels are kept at body temperature. The equipment has paddles inside the vessels that turn the contents slowly in order to simulate the churning of the stomach.

This equipment is used in both research & development (R&D) and in manufacturing. For R&D, it checks to see the rate at which various tablet “candidates” release the medicine; for manufacturing, the equipment checks to see if a particular batch of tablets meets the required specifications.

The challenge was to generate breakthrough ideas and requirements that a supplier could use to create a new generation of this equipment, which would be superior to current offerings, and would help scientists do their work far more efficiently.

Here are some of the design features the scientists and manufacturing personnel generated:

- Eliminate the body-temperature water bath in which the vessels are immersed. Instead, have a bathless system in which the vessels are wrapped in a transparent heating film that keeps them at body temperature. This change eliminates the 20 minutes it takes to heat the water to body temperature and eliminates the waste water that would need to be disposed of.
- Instead of the current six vessels, have a tower design that holds 12, 18, or 24 vessels within the same footprint on the laboratory benchtop.
- Enable the 24 vessels to run independently so that if one or more of the experiments in the 24 vessels fails, the others will continue uninterrupted (vs. all failing)
- Enable the user to receive a text, phone call, and/or e-mail if any experiments fail.
- Enable user to monitor and operate the system remotely from anywhere in the world.
- For easy servicing, the tower could be opened up like a side-by-side refrigerator.

The bottom line is that this equipment design speeds the drug development process while saving money; it enables users to get higher-quality test results in half the time or less while freeing scientists to work on other things during much of that run-time.