Averting the Grocery List Phenomenon

One of the challenges of many informatics projects is the “grocery list” phenomenon. A committee is formed, creating a series of requirements with little regard as to how they address improving laboratory operations or streamlining data management processes. Or, the “squeakiest wheel” pushes requirements in a direction which satisfies their needs, not those of the broader organization. These explicit requirements are difficult to achieve, as there is no prioritization or balance with the costs or readiness to achieve them.

Many times, the consequence is a request for proposal (RFP) sent to vendors with no context; all suppliers respond to it equally. Reading the RFP, suppliers are confused as to the real needs, so there are many “it depends” replies with a lack of specifics. The net result is that it is difficult to distinguish one product from another. This lengthens the time for implementation and considerably raises the users’ resistance level.

In two previous articles, I talked about the equation for electronic laboratory notebook (ELN) change management. The formula $Q \times D \times V \times CS > R$ illustrates how levels of resistance ($R$) are overcome by a combination of factors: the quality of the solution ($Q$), the level of dissatisfaction with the current state ($D$), the project’s vision ($V$), and the beneficial and tangible concrete steps taken toward vision realization ($CS$). In this article, I will describe exposing dissatisfactions and a process to assist in the development of the vision.

VOICE OF THE CUSTOMER

A best practice to discover underlying needs and opportunities for business improvement is a market research process known as Voice of the Customer, or VOC. Classically used for determining features of a new product or service, VOC can be applied to informatics to understand trends in the future business environment, data management pain points (i.e., dissatisfaction with the current state), and thoughts on an improved future state. This interactive methodology engages a wide range of users to seek not only their early input, but to engage them throughout the project’s life. VOC just doesn’t just ask people what they want; it is a process of discovery where data are collected and analyzed to identify business improvement opportunities and prioritize desired system capabilities.

VOC can involve individual interviews, group sessions, observations and surveys. We find individual interviews work best; open and closed questions in a one-on-one discussion allow a deeper investigation. Observation by immersion (a.k.a. shadowing) can be useful as a follow-on exercise; seeing problems first-hand can expose undisclosed capabilities. In a very large and/or geographically dispersed organization, surveys can help, particularly with capability prioritization, but are not as effective as human interaction.

The customers in an ELN VOC study are potential system users or those who supply data inputs or receive outputs. Interviewees comprise individuals that represent different perspectives of the complete
data and information value chain. For example, those who supply information to a laboratory (e.g., assay requestors), those who receive laboratory results (e.g., a project team), management, scientists and technicians. Also included are representatives of supporting functions such as legal, IT, regulatory and operations. Many times, those outside the target group will provide interesting and different perspectives than those in the laboratory. The objective is to gain a 360-degree perspective of the business challenges and opportunities, not just that of management or the most vocal scientist. The number of participants depends on the number of areas to explore — an ELN project for medicinal chemistry involves far fewer individuals than if multiple biology departments are to be included, for example.

One of the goals of the VOC interview process is to uncover “exciting” needs, not just the “desired” requirements that come from the committee meetings. In other words, what are the root causes of pain and dissatisfaction with the current state of data management? What are creative and innovative ways of leveraging technology to develop the future state? What can be done to streamline work processes even without technology?

**THE KANO MODEL**

In 1940, Professor Noriaki Kano developed his model of customer satisfaction, delineating various attributes of quality and customer loyalty. He challenged the assumption that incremental product improvements based on just asking people what they want result in delighted, or highly satisfied customers. The “Kano Model” describes three different types of requirements:

- **Expected**: Requirements that are generally unspoken and taken for granted (i.e., the ELN does not crash or destroy data)
- **Desired**: Typical requirements based on just asking people what they want the system to do
- **Exciting**: Unspoken desires that move a project far beyond peoples’ expectations — providing the “wow” factor

In Figure 1, Kano shows that, if expected requirements are not achieved, satisfaction declines rapidly (think of an ELN that takes minutes to return results from a query). Meeting the desired capabilities — in addition to the expected — results in satisfied users. However, a much higher level of satisfaction is achieved with meeting the unspoken or exciting requirements (e.g., a new method of data analysis).

One of the challenging aspects of ELN is the lab’s frame of reference. Since it is still a relatively new technology with a rapid pace of product evolution, many scientists do not know much about ELN, let alone what is possible. Therefore, the desired capabilities are often based on perceptions of how the lab operates using the paper notebook and/or managing data with Excel. The expected capabilities can vary widely from person to person without a common reference (documenting research with paper notebooks tends to fluctuate between individuals).

With a mature technology like LIMS, the frame of reference is often an existing system to be replaced. The desired capabilities are formed on what that system could not do, and the expected requirements are generally the features the old system could already perform.

As William Safire once said, “Never assume the obvious is true.” It is indispensable to approach VOC interviews with an open mind. Never take just one or two individuals as representative of the facts, and form opinions only after all the data is collected.

**INTERVIEWS**

The interview questions will make or break the ability to listen and to understand underlying pain points (the “needs behind the needs”). Listening during a VOC session will involve not only noting what is being said, but what is not said, although implied. An interview guide helps, as structure enables analysis, particularly with quantitative questions. However, much of the examination should be sufficiently open to enable an interactive dialogue. Many times, it is necessary to keep on topic and within a 30- to 60-minute time limit, so a completely free-flowing conversation may not be practical.

A tip is to break the conversation into three parts, discussing the current state, challenges and future state. People tend to jump right into the challenges. However, it is important to understand the current state to properly frame them.

It is suggested to stay away from ELN-oriented questions; people will dive right into their desired requirements based on paper notebook frame of reference. A business analyst should understand and analyze the broader data management issues, not that of a specific technology. In some cases, a project that starts as an “ELN” project may, in fact, turn out to be something else that provides far greater operational benefit to the lab (again, no assumptions).

Below are some example areas to explore. The specifics depend on the interviewee’s role in the organization:

- **Current operations**: The current strategy of the lab, future operational changes, current scientific and data management processes, tools currently in use, types of data managed, historical access, collaboration, use of information, technology experience, partner data exchanges, etcetera.
- **Challenges**: What keeps them awake at night? Problems with current systems, prioritized “top three” data management challenges, business process bottlenecks, etcetera.
- **Future state**: “White board changes,” or “If you had a magic wand what would you fix and how?” better ways of system interaction, what a “perfect” system would look like. Guide them to think with no constraints.

Another tip is to write up organized meeting minutes (based on the guide) immediately after the session. It can be
difficult to remember who said what!

After assembly of the interview notes, it is time to extract meaningful information. The trick is to derive common capabilities from the user data, analyzing the process challenges commentary — this routinely involves a bit of translation between what different people said. It may take several members of the project team to assist in the derivation. By organizing the information in a spreadsheet, derived capabilities can be grouped, e.g., by data capture, analysis, search, IP, and so forth.

(requires complete reorganization all the way down to minor process changes). The core project team and groups of potential users assist with these ratings.

After data analysis, the capabilities can be visualized in many ways, one of which is shown in Figure 2, comparing business importance against readiness. The number of mentions is represented by the size of the bubble.

The analysis is then reviewed with key project stakeholders. After approval, a summary analysis is incorporated in a project vision, highlighting business challenges and pain points that will be addressed and essential capabilities the new system must offer. This common reference document is used to build a shared project need and a common understanding throughout the affected departments. Users are encouraged that they were listened to, lowering their project resistance.

Moving forward, prioritized requirements can now be developed through detailed analysis and use cases of targeted areas of improvement, providing a tighter vendor selection and implementation time frame. M

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Figure 2: Example Voice of the Customer capabilities map

E2LN 5.1 was designed to fit the specific needs of scientists including chemists, biologists and analytical scientists, as well as any other employee in the organization. The software solution delivers the ability to use specific tools for reaction planning, structure searching, method analysis, image handling, metabolomics, proteomics and collaboration, along with a general approach to make any document, asset or record something that can be signed, witnessed and archived.

- ArtusLabs, www.artuslabs.com

E-WorkBook for Chemistry extends the functionality of the E-WorkBook software package with specific cheminformatics capabilities designed to meet the needs of medicinal, synthetic, analytical and process chemists, as well as those working in polymer chemistry, catalytic analysis, flow, green and scale-up chemistry. The solution’s chemically intelligent environment empowers researchers to capture, share, display, manipulate and search a variety of chemical data types securely.

- IDBS, www.idbs.com