

# Opportunity is Hidden in Plain Sight

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**Abstract**— All innovations must deliver on a customer value space to be successful. However, the word “innovation” literally means “new value”: so how can an innovation deliver on a value space that does not yet exist, at least as far as the customer can perceive it? The dilemma is rooted in the fact that the customer has a latent demand that they themselves cannot perceive but which the innovator must perceive. There are many examples of success in overcoming this dilemma, the iPod, the cardiac stent, or the BlackBerry, so obviously it can be done. The question is: *how?*

## I. THE PROBLEM

Any new innovation in development is often characterized as “market pull” or “technology push”. These are euphemisms for “the customer has asked for it but it doesn’t exist” and “we have invented it but need to find a job for it”. In the former case, there are almost always substitutes that the customer can employ and which may in fact have more capability (and profitability) than the proposed innovation. This often leads to easy dismissal of any proposed innovation since the customer does not perceive an unmet need; it is being filled by the substitutes. In the latter case, the inventor has perceived a need that the majority of the customer space has not: the proposed innovation is again easily dismissed because the market does not perceive a need. And yet, disruptive innovations do occur.

This paper is intended to delve into what is required to detect new opportunity even when the customers cannot. Much has been written on how to efficiently commercialize new opportunities, most of it based on stage-gate process models. Very little exists on how to find the new opportunity in the first place.

The core of the problem is to determine what the customers will value despite the fact that nothing to deliver on that specific value exists currently and many solutions exist that partially meet it [1]. A hallmark of disruptive innovation is that it generally provides solutions which have narrower capabilities than the preceding generation but which meet a previously unrecognized need. The innovation itself creates the market and the customer’s awareness of need.

In biomedicine, many successful innovations have been

introduced by clinicians. Julio Palmaz describes the conception of the cardiac stent as being inspired by his first learning of coronary artery angioplasty and wondering “why not put a scaffold in the vessel? [2]” The key phrase there is *why not*. But not all clinicians are successful innovators. Not everyone asks that key question. Those who do often generate valuable innovations – they understand the needs of the customer implicitly and are willing to ask *why not*. Which is why clinicians are frequently the innovators in biomedicine – very few of us understand clinical medicine as do the clinicians.

The success of customer-led innovation stems from their deep understanding of their own world. In biomedicine, that world is particularly complex and difficult to understand, but understanding is crucial to insure that innovations deliver real value. The clinical world includes dimensions of professional actualization, patient care outside of their own specialty, inter-provider communications, psychosocial factors with the patient and family, the marketing and profitability of the clinician’s practice or facility, and of course the technical success of their clinical work. Erich Joachimsthaler has termed this system of dimensions the “ecosystem of demand” [3]. For non-clinicians to deterministically innovate for such a world, models of that system must be built and utilized. With a model of “what they want”, creativity can be applied to generate new solutions and new opportunities found.

## II. ONE SOLUTION

### A. Setting the Stage

At the simplest, the solution is to understand the customer better than they understand themselves. This is a massive undertaking to perform *en toto*, so of course the goal must be narrowed. When selecting a research objective, a framing question, is the first step. Such questions can take the form of “Why does customer choose to perform action” where customer and perform action would be replaced by the population of interest and the activity in question. This presupposes that the actions of the customer are known.

Ethnography is the science of studying cultures *in situ* and can provide tools for determining how customers live their lives. One of the standard tools of ethnography is known as day-in-the-life-of research, which leads to detailed maps of activities and interactions. An example is shown in Figure 1. With those activities and interactions mapped, appropriate framing questions can be formulated.

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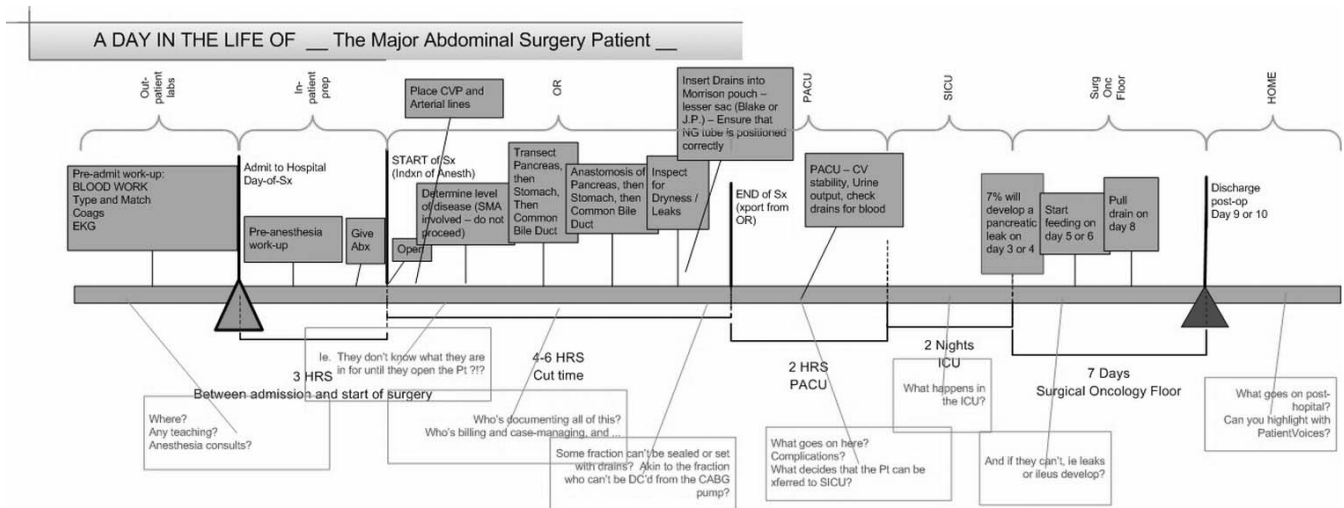


Figure 1: An example of a clinical day-in-the-life map.

### B. Study of the customer, the immersion stage

Answering the framing question is the next step. One effective technique is sometimes referred to as the Method of Five Why's. This is especially useful for framing questions built around the interrogative *why*. In applying this technique, popularized at Toyota [4], to market ethnography, the interviewer will ask the candidate for increasing depth of explanation of their motivations.

A hypothetical Five-Why's interview with a nurse about his patient, Mrs. X:

"I saw that you touched Mrs. X's elbow when you spoke to her. Why?"

*"Because it provides some personal engagement."*

"Why is engagement important?"

*"Because the patients often feel defensive."*

"What makes them feel defensive?"

*"It is an alien environment that they don't understand."*

"Why do they need to understand the setting?"

*"Because they can't internalize my instructions unless they feel comfortable with their surroundings."*

"Why do they need to internalize your teaching?"

*"Without effective teaching, their self-care at home will fail and lead to complications, readmissions, that sort of mess."*

These types of interviews generate a great deal of information about the frustrations, satisfactions, and overt goals of the interviewee. Further questions can also uncover how the interviewee currently attempts to compensate for the frustrating factors, leading to another round of Five-Why's regarding those attempted solutions.

Covert goals, those not explicitly stated or even recognized by the interviewee, can be inferred from the statements of frustration and satisfaction. Frustrations exist because a goal is being impeded. Semantically inverting the statement of frustration, then, can produce a new statement of goal.

The scope of the project defines how many interviewees are needed to build a comprehensive collection of interview data. This is not a quantitative technique; therefore statistical sampling sizes are not computable. However, the principles of managing the risks of making erroneous conclusions still apply. In practice, when you begin to hear the same answers from several interviewees in sequence, you have hit the bottom of the well. How many interviewees is that? This is clearly driven by the heterogeneity of the customer spaces you are attempting to map.

### C. Building a landscape, the analysis stage

The final step is assembling a model of the customer's goal structures, a landscape of demand. In the database of overt and covert goal statements, there will be many similarities, or themes. These similarities are likely to be perceived differently by the various team members on the project, and diversity of perspective is important since it will insure a thorough and exhaustive analysis stage.

Making sense of the wide range of interview responses can seem quite daunting. Sensemaking methods are the key. A well-known sensemaking method is *clustering* [5]. To extract meaning from the interview data, the individual responses are pooled into related concepts by a team of informed people, usually the same people who did the data collection field work. The clusters can then be named, and those names treated as symbols representing the common concepts. An example of a clustering result is shown in Figure 2, with clusters of individual responses ranging from just one to more than a dozen.

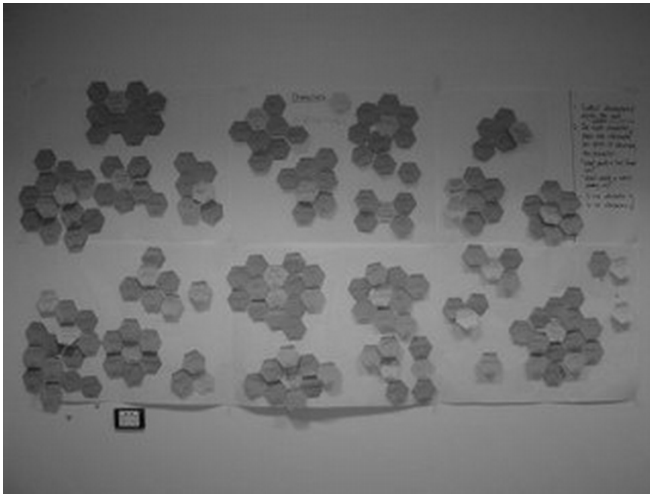


Figure 2: Example of clustered ideas with sticky-notes [5].

Clustering the clusters leads to a hierarchical tree of goals which spans the ecosystem of demand, a model of what the customer wants to accomplish in their daily life.

#### D. Acting on the demand, the innovation stage

Taking action from the insights generated is the most challenging and rewarding aspect of this approach. Many different paths forward are possible. Portfolio management and *de novo* innovation activities bare the two most obvious uses.

Portfolio management is the balancing of work loadings, by projects and product lines, to insure that risk and return are consistently achieved. The demand landscape provides a tool for establishing priorities based on the ability of any given project or product line to meet the complete goal set of the customer. By examining that ability to meet each of the goals in the landscape and summing those abilities together, an estimate can be built of the project's potential to fit into the customer's world and deliver valuable contributions. While other factors are important in prioritization of projects, such as available resources and intellectual property strategies, it is the customer's choice of the offered product or service which drives the business. The demand landscape, then, provides a means of using formalized knowledge of what the customer wants to insure the business is working on that which the customer values.

*De novo* innovation, i.e. the generation of wholly new ideas, is also possible by using the landscape of demand. Starting with a core technology, new ideas are easily generated by asking a cross-functional team to brain-storm on how to better meet the customer's demand for any one (or combination) of the goals in the landscape. To be effective, this team must be familiar with their core technologies, with a wide range of experience in other technologies, as well as with the details of the demand landscape. In general, the landscape of demand is very powerful input material for several known tools for managing creativity, such as Edward

De Bono's Six-Hat Thinking [6]. What is proposed here is equivalent to employing De Bono's green-hat method using the demand landscape as input. Then, by examining each new idea in the light of the remaining goals in the landscape, the idea can be enriched and expanded. De Bono's other six-hat tools can then be applied in turn to the new ideas to generate insight about the ideas as well as improve them.

#### E. Putting it all together

Opportunity starts with a deep understanding of the ecosystem of demand. From the customer's view point, that ecosystem extends far beyond simple product performance. The described method examines that ecosystem with ethnographic tools, builds models of it in terms of the goals landscape, and then uses the model to both create new ideas and prioritize existing ones. Following this technique will uncover opportunities where others have passed over without a glance.

#### REFERENCES

- [1] C. M. Christensen, S. D. Anthony, E. A. Roth, *Seeing What's Next*, Boston, MA: Harvard Business School Press, 2004.
- [2] In "An expert interview with Dr. Julio Palmaz: Part I -- Serendipity and the stent", *Medscape Radiology* 5(1), 2004.
- [3] E. Joachimsthaler, *Hidden in Plain Sight*; Boston, MA: Harvard Business School Press, 2007, pp. 19.
- [4] T. Ohno; in foreword by N. Bodek to *Toyota production system: beyond large-scale production*, Portland, Or: Productivity Press, 1988.
- [5] In *ANECDOTE: Putting stories to work*. Available: [http://www.anecdote.com.au/archives/2006/05/hexies\\_postit\\_n.html](http://www.anecdote.com.au/archives/2006/05/hexies_postit_n.html).
- [6] E. De Bono *The Six Thinking Hats*, 2<sup>nd</sup>. Ed., Back Bay Books; 1999.