Workshop: About Business and Product Development II
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Words Mean Something, Not Necessarily the Same to Everyone

I am always amazed at how words mean something, but rarely the same thing to different people. One of the hardest words to get agreement on is the word customer. It's used in so many different ways by each function within a corporation that rarely is there the same image conjured up in each mind in any conversation where the word customer is used. The clearest insight into this problem came when I was reading a book by William Luther called *How to Develop a Business Plan in 15 Days.* At the very start of his book, Luther begins:

> "In December 1984, I was hired by Clemson University to conduct a two-day marketing seminar for five state colleges in Florida. The first half-day was most difficult, because the people from the colleges kept stating that there was no way someone with no experience in education could help them develop a marketing plan. I tried to convey to them that the planning process was the same regardless of the type of product or service, but they just wouldn't buy it. The use of a bad analogy made matters worse – the analogy being that the planning process was the same whether you were selling a college or a can of beer. The meeting did not go very well until just after lunch, when they were presented with a five-step procedure that helps you determine who your customer is and what the message should be. As I went through the sequence, I proved to them that they had been spending all of their marketing dollars for the last five years on the wrong target audience.

> "Like so many other institutions of higher learning, these colleges realized that they must get a better understanding of marketing, now that federal and state funding assistance has diminished. The group was openly hostile until the purchase-process priority was discussed. When asked who should be number one in the purchase-process priority, the college officials, after several minutes of discussion, stated that it was the parent. Number two was the high-school guidance counselor. The student was listed as number three. At this point, I asked them how they had been allocating all their marketing dollars during the past five years. Almost in unison they said words to the effect of 'son of a gun.' They had been committing their complete marketing budget to the students."

Here we are 18 years later and colleges are committing the same mistake. Our three kids are now in college and our household has been the recipient of untold pieces of marketing literature from colleges starting in the sophomore year of high school for each child. In the six years we've endured this onslaught (2-5 pieces of mail every day), not a single direct mail piece was addressed the parents. Everything was aimed at the student. Amazing.

Luther's process starts by identifying those categories of people involved in purchasing decisions, and then classifies them as influencers, purchasers and users. In the above example, the parent is typically the purchaser, the guidance counselor is an example of an influencer, and the student is the user. So when we start talking about customer, it is important to think just a little harder to understand which role the person we are talking about is playing – influencer, purchaser, or user.

One of the fundamental mistakes made in product development is focusing all of the design and functionality on the user. The most successful products design in capabilities for the purchaser and influencer.

Another definition of customer was popularized by Deming as part of Total Quality Management – customer as next person in line. As business becomes more market and customer centric, we tend to think of customer in an external sense. Deming pointed out that it is hard for most of us when we are inside of a company to have much exposure to an external customer. Therefore, it becomes easy to think that quality is someone else's problem and nobody will realize I'm not paying attention because I'm so far away from the customer. Deming then defined customer as the next person in line to receive the work that an individual produces. By providing this definition of customer, more direct measures of quality can be taken.

Whole Product Thinking
Geoffrey Moore is one of the best marketing management writers in the business today. His first major work, *Crossing the Chasm*, introduced to a wide audience the notion of Whole Product thinking in conjunction with the Technology Adoption Life

Cycle. I use this model as the first thing I introduce in my graduate school classes at the Institute of Design of the Illinois Institute of Technology to aid both with analysis of existing products, as well as, to help generate ideas during the brainstorming phase of product creation.

Moore describe the Whole Product Model in the following excerpt:

> "One of the most useful marketing constructs to become integrated into high-tech marketing in the past few years is the concept of a whole product, an idea described in detail in Theodore Levitt's *The Marketing Imagination*, and one that plays a significant role in Bill Davidow's *Marketing High Technology*. The concept is very straightforward: There is a gap between the marketing promise made to the customer – the compelling value proposition – and the ability of the shipped product to fulfill that promise. For that gap to be overcome, the product must be augmented by a variety of services and ancillary products to become the whole product.

> "The formal model is diagrammed by Levitt as follows:

The Whole Product Model

Potential Product
Augmented Product
Expected Product
Generic Product
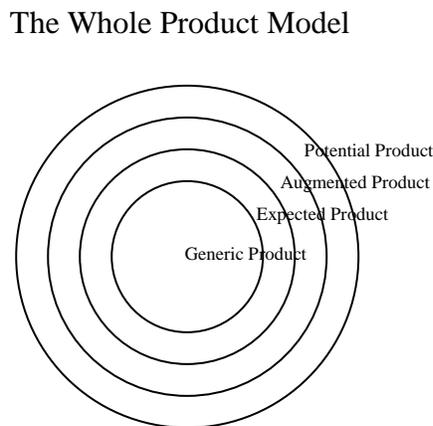
> "The model identifies four different perceptions of product, as follows:

> 1. *Generic Product:* This is what is shipped in the box and what is covered by the purchasing contract.
> 2. *Expected Product:* This is the product that the consumer thought she was buying when she bought the generic product. It is the *minimum* configuration of products and services necessary to have any chance of achieving the buying objective. For example people who are buying personal computers for the first time *expect* to get a monitor with their purchase – how else could you use the computer? – but in fact, in most cases, it is not part of the generic product.
> 3. *Augmented Product:* This is the product fleshed out to provide the *maximum* chance of achieving the buying objective. In the case of the personal computer, this would include a variety of products, such as software, a hard disk drive, and a printer, as well as a variety of services, such as a customer hot line, advanced training, and readily accessible service centers.
> 4. *Potential Product:* This represents the product's room for growth as more and more ancillary products come on the market and as customer-specific enhancements to the system are made.

> "In the PC world, on the product side, this means having an open architecture – the bus slots on the IBM PC, for example – such that third parties can build add-in boards to extend the capabilities of the product. On the service side, this might involve hooking up with network-based service providers such as Prodigy or CompuServe to provide on-line banking, information services, and home shopping. In the area of supporting customer-specific enhancements, it means providing some sort of development language and environment.

"Now at the introduction of any new type of product, the marketing battle takes place at the level of the generic product – the thing in the center, the product itself. This is the hero in the battle for the *early market*. But as the marketplaces develop, as we enter the *mainstream market*, products in the center become more and more alike, and the battle shifts increasingly to the outer circles."

To gain a better understanding of this model, I have students deconstruct two very different products – a Starbucks café and an online newsletter like AnchorDesk on ZDNet:

http://www.zdnet.com/anchordesk/stories/story/0,10738,2699718,00.html

If you look at a Starbucks Café what is the generic product offering:

Most people start off with the coffee offering and forget about all the design work that has gone into the environment and the "crafting" of a cup of coffee. It is attention to the design details of the environmental aspects of the café that allows a Starbucks to charge 2-3 times what others do for a cup of coffee. Go through a quick deconstruction of Starbucks in the context of generic product, expected product, augmented product, and potential product to get a feel for this model.

Then do the same for an information based product like Anchor Desk. In both cases it is helpful to actually experience the product. In the Starbucks case, go find a café and have a cup of coffee. Better yet, experience several different Starbucks locations to see the range of designed experiences – Starbucks at the corner of First and Yesler, at the airport, within a mall, the Starbucks restaurant near Lake Washington. How are each of these settings differentiated by local market or user type? Similarly, sign up for AnchorDesk and experience a daily newsletter. How does a free newsletter make money? For both businesses, who are the influencers, purchasers, and users? For a given function within one of these businesses, what are some examples of the Deming type of customer?

And by all means enjoy a cup of coffee or tea and great conversation while you are thinking through the meaning of whole product.

How would you describe the Whole Product for the Evergreen Cab company project? While it's a little early to answer this, from what you've heard to date, what might be the generic product? What might our customer expect? Who are other companies that we could get to join us in a value web to produce the augmented product? What are the potential products that might result from this research?

Building on Digital Assets

As I looked at successful web sites and software products that have emerged over the last 20 years, I began to see a pattern emerge – building from digital assets rather than financial or physical assets. I call the pattern r2DNA for *recombinant reflective digital network assets*.

The best software products and web sites aren't just about code, they also include ways to extend the code either through

content or plug-ins. Digital assets can be as simple as a record in a database or as complicated as a browser plug-in. A networked digital asset is the start of creating a value web by linking my digital assets through the network with someone else's digital assets. Recombinant implies that I am able to recombine either my digital assets or networked digital assets to provide increased value to the user. Finally, reflective has several meanings. The simplest meaning is to create a mirrored space, much like the P2P technologies are doing today. Groove is an example of a technology that mirrors collaborative spaces on peer computers rather than on servers. The next level of reflection is to pay attention to the pattern of user interactions to discern a higher order intent. For example, Amazon.com may notice that a person is buying several books on management and begin to figure out that someone has gotten a promotion. The system could test that assumption directly and then start suggesting hardware or software to purchase, other books, or possibly seminars to attend. The last meaning of reflection is similar to what Donald Schon describes in *The Reflective Practitioner*, where not only do you feed back from actions and their consequences to the next set of actions to take, but you also feed back to your theory about what is taking place. This type of reflection enables double loop learning (see discussion of Model 1 and Model 2 behavior).

If we take a look at the Books section of Amazon.com we can deconstruct the website from an r2DNA perspective:
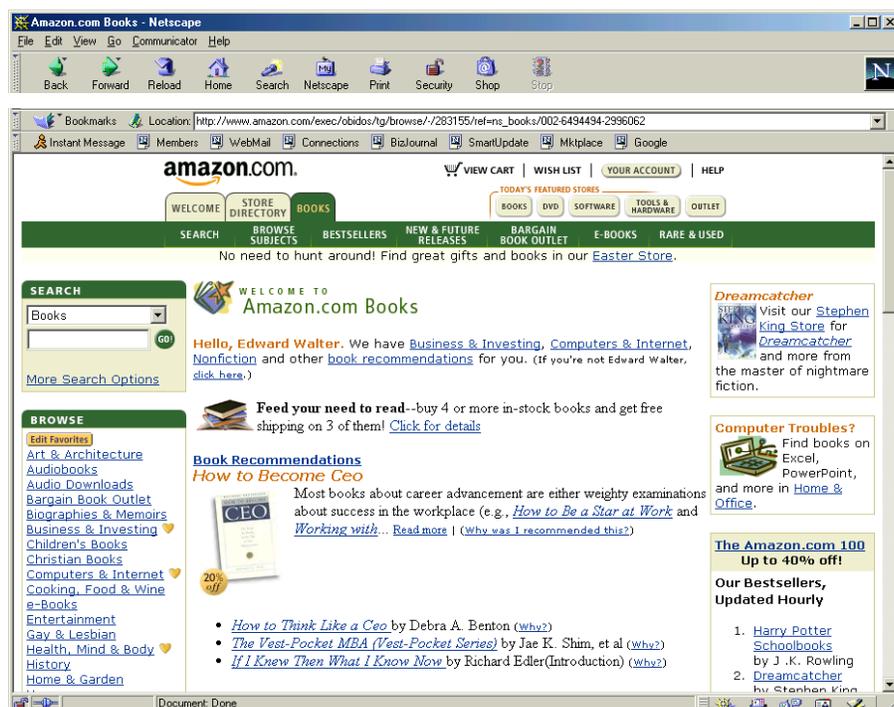
From a *digital asset* standpoint, we can start a long list of the digital assets that Amazon.com has just on the books section. Here is just a partial list of the assets:

- Demographic information like name, shipping address, bill to address
- What topics I'm interested in like: business and investing, computers and internet, health, mind and body.
- Order transaction history
- Ratings of books that were purchased or are owned
- Reviews of books
- Database of information about books, both books in print and out of print
- Cover images for each book
- Inventory status for each book
- Selling history of each book

With a well developed site like Amazon, the list of digital assets can go on and on.

To see the effect of *recombinant*, we start looking at the ways in which Amazon begins to make recommendations. The book recommendations are made by looking at others who have bought the same book and seeing what they also purchased. Another way of recombining assets is to look for demographic indicators – people like you are also buying XYZ book. While there is not a clear example of *reflection*, we are starting to see the capabilities for humans to reflect on the underlying assets through the introduction of related lists of books whenever one does a search. Searchers can also rate other user reviews as to

how helpful they were in selecting a given book.

Finally, from a *networked digital asset* standpoint we see a couple of examples. Within Amazon, digital assets are networked from store to store. The system comes up with messages like people who bought this book also liked these CDs or DVDs. Perhaps, the most useful networking of assets is connecting the user to UPS for package tracking of an order. When Amazon acknowledges an order it also provide the tracking number and a linkage to the UPS site so that the user can check to see where the package is on its journey from Amazon to the specified delivery site.

To get a better feel for how others use digital assets, use the r2DNA descriptive model to look at 3-4 websites. I would recommend doing a full deconstruction of one of the Amazon store sites all the way through to the ordering and delivery assets that are kept. Then I would look at two other classes of sites: financial investing and trading, and travel sites with an airline that you have frequent flyer relationships with. If you get a chance, pay particular attention to any mapping or analysis tools that might be present like Fidelity and Smartmoney.com are providing. What are the r2DNAs used to supply the market map at SmartMoney.com?

As a brainstorming or design tool, r2DNA is particularly helpful at the innovation stage. The sequence that one should think through the r2DNA in order to be prescriptive is:

- Identify the *Digital Assets*
- In what ways can the Digital Assets be *recombined*
- What other Digital Assets can I *network* my Digital Assets to
- For a given user, *reflect* on the pattern of usage to determine higher order intents or goals on the part of influencers, purchasers and users.

Perhaps, the biggest step forward for the kinds of software tools that we want to build is to have the software itself be reflective so that it can learn as it interacts with users. For example, in the early use of Attenex Patterns, each of the attorneys is constantly developing new strategies for how to identify clearly non-responsive and clearly responsive documents. These strategies need to be rapidly shared with the other attorneys doing the initial review on that case. Over time we want to figure out how to incorporate these strategies into the system so that more of the analysis can be done automatically.

Simple Rules Lead to Complex Behaviors – BOIDs & r2DNA

An exciting break-through in computing came from Chris Langton at the Santa Fe Institute when he discovered that flocking behavior in birds could be simulated with essentially three rules. Most of us assumed that there was always a leader of the flock. Chris showed that with three rules he could emulate flocking thus starting the field of generative computing.

Flocking - the BOIDS

Flocking Rules:

1. Boids try to fly towards the center of mass of neighboring boids.

2. Boids try to keep a small distance away from other objects (including other boids).

3. Boids try to match velocity with near boids.

http://www.cse.unsw.edu.au/~conradp/java/Boids/example.html

The music that you listen to on the web site of Sseyo (http://www.sseyo.com/) are compositions done with a program called Koan. Now I am not a composer by any stretch of the imagination. I grew up playing the trumpet and French Horn in high school band, but never took any composition courses. I am not particularly able to hear new compositions in my head, rather I whistle tunes that I like. Then I came across this program on the net and downloaded the player. Every time I listened to a piece from SSEYO's web site it was different, yet the same. What was going on? So I downloaded the composition tool.

In a short burst of fooling with the interface, I created my very own composition. I didn't like that first composition very much so I started over. I found some sounds that I liked from the downloaded templates and through easy dragging and dropping I created music like on the web site.

What I now had in my hands was a tool that was matched to my level of capability. At the lowest level I don't know how to compose. But at the level of function I know what music I like to listen to. This tool now allowed me to create music that matches my taste. I urge you to play with the tool and see if you can generate music that you enjoy. The neat part is that each time you play it, it's different. Similar but different – that's generative music.

Brian Eno, famous as a music producer, worked with the producers of Koan to refine their tool set. In his book *A Year with Swollen Appendices* he describes the nature of generative music:

> "Ten RCA students over to look at Koan and screensavers. I gave them all a talk about self-generating systems and the end of the era of reproduction – imagining a time in the future when kids say to their grandparents, 'So you mean you actually listened to exactly the same thing over and over again. Interesting loop: from unique live performances (30,000 BC to 1898) to repeatable recordings (1898 -) and then back to – what? Living media? Live media? Live systems?"

He goes on to talk about composing generative music:

> "Of course, the real can of worms opens up with the new stuff I'm doing – the self-generating stuff. What is the status of a piece of its output? Recently I sold a couple of pieces as film-music compositions (a minor triumph, and an indication of how convincing the material is becoming). I just set up some likely rules and let the thing run until it played a bit I thought sounded right! But of course the film-makers could also have done this – they could have bought my little floppy (for thus it will be) containing the 'seeds' for those pieces, and grown the plants themselves. Then, what would the relationship be between me and those pieces? There is, as far as I know, no copyright in the 'rules' by which something is made – which is what I specify in making these seed programs."

> "For me, this is becoming a stronger body of work every day. Having now had the chance to try out some of the work on lots of different people (even without telling them how it is being made), I am convinced of its musical worth. Then the fact of its infinite self-genesis comes as an incredible bonus. So I will be very happy if, at the end of it all, I get recognition as a pioneer in this area. That in itself (given the way things have worked for me in the past) will also turn out to pay the bills. It's something to do with what Esther Dyson was saying about servicing an idea: if I let the idea free, then I get paid for servicing it – extending it, updating it, extrapolating from it.

> "The end of the era of reproduction."

Then Brian goes on to tie the many generative systems together:

> "A by-the-by: I've noticed that all these complex systems generators (such as 'Life' and 'Boids' (the flocking one) and 'The Great Learning') have something in common – just three rules for each. And these three rules seem to share a certain similarity of relationship: one rule generates, another reduces, another maintains (or a tendency to persist). I suppose it's obvious, really, but perhaps it's not trivial to wonder if those three conditions are all you need to specify in order to create a complex system generator (and then to wonder how those are actually being expressed in complex systems we see around us)."

While the Koan tool works well for me, it is not the appropriate tool for some one who does know how to compose or someone who is willing to learn how to compose. For that, the SSEYO folks created KOAN PRO. This version lets the composer manipulate more than two hundred separate rules that go into the creation of the templates that are in the basic Koan tool. However, the novice can use the KOAN PRO tool to modify those templates set up by others. With the three tools, KOAN, KOAN PRO, and the KOAN player, anyone can quickly compose music to suit their taste. Imagine, me, a composer. Better yet, imagine, you, a composer.

Over the years, the Boids programs and understanding have proliferated. My personal favorite is BOIDS. I can stare at this for long periods of time, much like losing yourself in watching the fish and plant life in an aquarium. The BOIDS home page provides considerable detail in what is behind the rules in the program and has several downloadable examples of the programs for birds, fish schooling and other similar behaviors. To look at how you can change the parameters associated with the rules, download one of the Boids programs and see another form of generative software.

Once exposed to this idea of how complexity can arise from the interaction of simple rules, one is never quite the same in looking at the phenomena in nature, social groups, and business. Nicholas Negroponte in a talk at a recent TED conference quipped "he's so ignorant he still thinks that bird flocks have leaders." This is as esoteric a put down as one is likely to encounter.

Another example of generative computing in the visual realm is Imogene originally developed for the Thinking Machines massively parallel computer. Starting with a random set of generated images then using genetic algorithms it generates new images. As a user you guide the generation by selecting which variants appeal to you. You are playing god with the program's evolutionary behavior. As you pass through generation after generation "selecting" images you become aware that there is an aesthetic at play that you are trying to trace. As Joe King of Design Intelligence noted "it's real hard to play god. It's difficult to be explicit about what you are trying to select for. If you aren't clear then you just end up with visual mush." Or as my organic chemistry professor at Duke used to call the Fourth Law of Thermodynamics "all organic chemistry reactions if left long enough eventually turn to gunk."

While the above examples are interesting and show the future of computing, a useful example of generative software is iPublish from Design Intelligence. This program provides the user with a graphic designer through software. It is page layout for the rest of us. Good communicators know that the communication of a message has as much to do with the form of the message as with the content in the message. For the medium of print, graphic designers are critical for translating the desires of a client in order to meet the needs of a consumer. A graphic artist balances the rules of layout and typography and illustrations to create a print piece that communicates. Programs like Quark and PageMaker became invaluable tools for the graphic designers to make the representation task easier, but did little for the rest of us in terms of understanding what is good form.

IPublish makes the task of generating the form quite easy. The user creates or identifies the content they want for their print or web output. Using iPublish they then select a template or style of representation and then the program uses a generative set of rules to make all the layout decisions about form that a graphic artist would make. The brilliance in their approach is that they didn't write an exhaustive set of rules for every possible condition of layout and medium that the layout could be published in. Rather they created a simple set of rules that then interact with each other to produce good-looking results. To make life even easier the user interface is tightly integrated with the web and uses drag and drop technology. If you like some text, photos or illustrations on the net or on your own computer, just drag and drop and your document adjusts itself automatically. Cool.

The art form of generative product design is to come up with a comprehensive set of Digital Network Assets that can then be endlessly recombined using "BOIDS" like rules to better meet the needs of a diverse set of influencers, purchasers and users.