Research to Reality: A Business Perspective

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Ricoh Innovations discovers unmet customer needs and designs and deploys hardware, software and service solutions to those needs through an interdisciplinary design process predicated on active customer participation. Some of our findings lead to new value propositions on which Ricoh planners investigate entirely new businesses. We attribute our success to our ability to translate our findings into actionable, risk-sensitive business cases tested and improved with active customer participation. We collaborate closely to weave our activities into critical product planning milestones, but retain ownership for the process of site selection, research, synthesis, business modeling and transfer to ensure success. As a result, Ricoh launched a new product line based on our research, in less than a year and our methodology is now used by other Ricoh research groups to serve Ricoh's European and Japanese markets. The first half of this paper outlines the organization and methodology used to identify customer needs, and prove the associated value of a customer-design solution. The second half comments on some of the techniques we use to filter and package our results for optimal impact on the product groups.

Customer-Derived Innovation Methodology at Ricoh Innovations

Four years ago we recognized that coupling ethnographic based field research with participatory design and rapid prototyping would be an exciting new way for Ricoh to identify and meet latent customer needs. Understanding that this would entail sensitivity to both research and business concerns, Ricoh tapped a business person to head the new team and championed the initiative through the support and protection of a senior corporate executive. Based on the "customer-driven" culture of Ricoh we knew there would be immediate interest in the rich customer data we would provide, however we also knew that a solution design would not be enough to inspire a product planner to implement our ideas. In addition to a solid design we would need to prove: 1) customer value, 2) purchase intent, 3) profit potential and 4) delivery and support ideas (if it was a software or service Ricoh did not currently offer in North America).

Informed by these insights, we created a core multi-disciplinary team of eight people and created a methodology defined by six major phases, that when laid end to end, last roughly six months. Our philosophy is to engage in many short research projects, so that we can gain insight from many customer settings, and develop a rich tapestry of actual customer insights, that can be used in conjunction with other demographics, to clarify the actual customer need for markets that Ricoh marketing teams have deemed commercially viable. Figure 1, outlines the steps of our process in an ideal order and provide concrete examples to illustrate each step.

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FIGURE 1 A Six-Phase Project Process Is Competed By a Ten-Person Project Team

Our methodology begins with a month-long phase of contextual inquiry and ethnographic research. Ten-person project teams are responsible for accurate data collection, idea synthesis, design origination (then used in participatory design sessions with the customer site), prototype development, numerous prototype iterations, development and collection of both qualitative and quantitative metrics, and last and most importantly, business-centric conclusions. In order to address this array of tasks, our multi-disciplinary teams include at least two user researchers trained in ethnographic-based contextual inquiry, an intern, an external contractor, an interaction designer with skills in solution visualization, two engineers, and from 2-5 customers - which includes active collaboration with both users, buyers and management.

We keep team size at eight to ten people. Otherwise, team creativity and spontaneity diminish under the weight of coordination burdens. Keeping the core team of a project small allows all team members the ability to immerse themselves in the rich user data, as well as maintaining the ability to visit the research site frequently. We surround each team with "supporting team members" from technical research, product planning and other interested internal groups who shadow the project and deepen their understanding of the customer perspective as they support the team. Occasionally supporting team members are contractors that we bring into the project because of their technical, subject matter or other type of expertise.

Of the ten member team, the three to four most senior members run the project and take on a dual role as 1) subject matter experts for their discipline, and 2) "meaning-makers" that synthesize the findings into actionable results. The team's results manager, is responsible

for identifying the right product planner or business planners to whom the results will be targeted. Our Results Manager is always a seasoned product planning employee from Ricoh Japan who already has existing relationships with the product planners in Japan, the United States and Europe. The research team members, who are deemed "meaning-makers", work with the Results Manager to tailor research results to the needs of the receiving planning groups.

The initial research phase, labeled "initial research" in figure 1, leverages the anthropological roots of ethnography as a means to describe how customers understand and perform their work today and identify unmet needs. We use a codename for the site, and titles, instead of names, for the users, so that we may share the information about the site, while keeping the customer site confidential. Each project creates a rich set of data and so provides an unedited view of "work" in a customer's setting. Photo diaries, short videos and customer quotes are highly valued by our overseas corporate office. We are expanding to meet internal demand and are always looking for better ways to categorize and present the information on our "findings" website that is available corporate-wide.

The needs from the customer site are then filtered to identify the ones that are important to the site, within the core competency of Ricoh, and reflect an adequate market opportunity. We try to get as many team members involved on the site as possible in the work of describing what is happening at the site, and observing unmet needs. We find that by participating in the fieldwork all members (and most especially supporting non-core members) gain a fresh perspective on what "work" really looks like on the ground and can actively participate in creating the list of unmet customer needs.

During the "initial design" phase we document our understanding of the customer's specific situation and deepen this understanding through workflow charts, photo essays, etc that are instantly available on our project wiki. Once we have a clear idea of what the customer wants to achieve, we then discuss the myriad ways of solving it and also identify the corresponding value for Ricoh.

The customer's role in this process depends greatly on the individual. Some customers act as grounding points by which ideas are weighed for merit and critiqued for improvement. Others dive right into the collaborative process and communicate directly to us how they themselves think things should work. In either case, we gain insight into the best design, as well as why and how solving the issue is perceived as valuable for the customer. We learn the right vocabulary for expressing the issue in its industry-specific context and we capture all of this information on our internal wiki.

At this point we move into a paper-prototyping phase where we sketch out the workflow understanding or build cardboard 3-D designs, or create a visual story. Listening carefully to customer reactions provides the most telling information. Each question or confusion regarding a prototype reveals a mismatch between our mental models as designers and the customer's understanding of their work. These mismatches help us refine our

models of work as we probe to understand priorities and identify trade-offs. Over the course of a few meetings, we usually get to the stage where we all agree on the scope of the project and what metrics need to be captured in order to obtain both a qualitative and quantitative assessment of our research.

Once a functional prototype has been developed, we deploy that to the customer site for three to eight weeks. Early on in the deployment, we make an effort to not intrude on the customer's workflow. Our team notes the discovery process through software logs as well as observing use patterns. This phase usually lasts between two days and two weeks.

Once we have gathered as much as we can from the discovery process and initial use, we flow into a month-long process of iterating the solution design with the customer, and, sometimes literally over night, we improve and re-deploy the prototype. Each step of this iteration process provides useful information for other groups focus on designing products and developing use cases. Past projects on our wiki serve as a visible reminder than no matter how smart and talented a team one has, and no matter how many customers one involves, version 1.0 of any solution is a long way from perfect. It is not uncommon for our prototypes to go through twenty iterations from final design through deployment completion.

In typical practice, projects rarely proceed in this perfectly ordered six-step fashion. Innovation based on ethnographically-based research is always intriguing and never the same twice. We adapt to our customer requirements, so it is not unusual to hear "we're trying something new at this site"- which usually involves jumping on serendipitous opportunities, creative scheduling, condensed deadlines, spur of the moment brain-storming sessions, and project changes based on good old-fashioned luck.

Initially our results were met with great interest from the product planning groups, but none of our findings or design concepts directly informed a new product offering. After a tumultuous first year of work, in which none of our efforts transitioned into commercial product plans, we began tailoring our research needs to the needs of individual planners who were interested in our work. Specifically, we augmented our research reports with a one-slide summary of the core business value of our work, and added a short video to every report, that explained our process as well as our findings in the context of the customer's environment. Applying the learnings in the second half of this paper, our results now meet with great success. This new innovation method for Ricoh continues to evolve, even as it is being institutionalized and used at other Ricoh research centers around the globe. We have completed almost twenty projects and with each new project requests for specific information on sites and projects continue to rise. Over the past three years its has catalyzed three new solutions, two new business cases and one additional service idea that other groups in Ricoh are in the process of commercializing.

On Being Heard: Lessons Learned

Our experience reveals that when delivering good user research, it is not enough to be "heard"; rather, it requires transforming findings into actionable results and working with other business units to achieve them. Our success is as much to our skill in filtering, packaging and relating our results in ways that are readily actionable by Ricoh group as it is to the rich and valuable findings. The remainder of this paper discusses the extensive efforts in communication required to ensure your research findings fall upon fertile ground. Successfully transferring our findings, requires as much time and attention to identify the right "catcher" as we spend identifying appropriate research sites. At Ricoh that means providing each product team with only what is relevant to their project, and packaging it in a way that is applicable to the current planning stage.

We've studied the internal groups who rely on our findings, just as we study our research subjects, in order to glean what are their hidden needs. Since all planning groups are designed to move products through the planning process, it is safe to say that they always need actionable concepts. The hitch is that the definition of actionable concepts changes depending on the stage of planning at which each group is currently. Through a series of trials and failures over a four year period, we honed our process and deliverables to precisely match the needs of the receiving product or new business group. Successful transfer of research results is predicated upon tailoring the findings so that they were both clear and actionable for the receiving group. Our research team has to think like an entrepreneur, and balance both the needs and desires of the customer with the economic realities of running a business. When we simply focus on our research activities, our hard work typically is misunderstood because the corresponding recipient organization is not ready or able to incorporate our work into their current task. Five elements emerge from our experiences which others may find useful. These elements are explained below:

Element 1: Cultivate a team culture

One of the most challenging issues faced by our multi-disciplinary approach is the potential for factionalism among the four major disciplines: business, engineering, interaction design, and ethnographic-based user research. Each discipline is steeped in its own perspective, luminaries, and methodologies which must be melted together with the objectives of the team to create a consistent view of the customer's problems across two different perspectives.

The ethics of protecting the research site from exploitation, and concerns for confidentiality form the foundation upon which notions of process and completeness are hammered out and layered. No discipline has the upper hand in decision making. The customer needs and the customer's willingness to participate are paramount. We do not monetarily compensate our research sites. They volunteer to be researched, and understand well that whatever we jointly build and test will be removed from their site at the end of the project. Their reason for participating is an expectation of valuable insights they can apply to their business. It is the very same expectation we have at Ricoh. Every team member, including the customers, is willing to participate to learn insights.

This often involves "bending", and occasionally "breaking", disciplinary taboos. Our business people have to create business cases in weeks, not months. Our user research team must provide insights in weeks, not years. Our interaction designers must forego beautiful visual design, and concentrate on use experience. Our engineers must cobble solutions in any way that will actually work, all the while, thinking through how they would explain the correct way to approach the issue when asked. Fostering this culture of collaboration and expedience is critical to success and yet largely juxtaposed to the culture of more traditional research labs.

Element 2: Transform "researchers" into "change agents" who own responsibility for the end success

Like most of companies, Ricoh judges research value in terms of business results: profits, enhanced customer relationships, and increased revenue. This means that we cannot expect others who are not intimately involved with our research to make the proverbial leap to innovation. We have to do it – and so we have to be the change agents who will convey the message to the company as well. Paul Horn, who oversees research at IBM, stated in an interview with *The Economist* last year that: *"the idea devalues over time, if you don't get it to market quickly. Everything we do is aimed at avoiding a 'handoff'- there is no 'technology transfer'. It is a bad phrase at IBM. Research teams stay with their ideas all the way through to manufacturing."*[1]

At Ricoh, our research team succeeds by carefully listening to the objectives of the product divisions, and crafting our results so they fit easily into the product specifications and market requirement documents of the receiving groups. Much as if I tell you that the word "Nitrogen" can be re-arranged to spell a multi-billion dollar business that didn't exist ten years ago, I have left you with a puzzle, rather than a solution. If instead, I simply tell you that through research we have identified the "Ringtone" business that leverages core elements of our Nitrogen business, and describe how the elements can be re-arranged, I have given you a potential solution to consider, and a means of pursuing it. More often than not, this type of exercise requires our team to help the product planning group unlearn some assumptions they have made along the way. The case study below describes how researchers can proactively changed one marketing manager's mind about the value of user experience research by contrasting it with the experience provided through the current offering.

[1] Eric Schmidt, *Out of the Dusty Labs*, www.economist.com/science/displaystory.cfm?story_id=8769863 (Jul 2007).

Case Study- Transforming researchers into change agents

In one of our projects our team explored the need for quick, cheap, personalized marketing brochures. Through a mix of market research and contextual inquiry, we described the opportunity to create software-as-service that would deliver a vastly superior custom brochure printing experience, without the need for the customer to leave the office. We described how, through participatory design, we had identified a way for customers to print beautiful, professional quality custom brochures from our existing line of printers and copiers. The marketing manger retorted that Ricoh had already tried "that" and it hadn't worked. "That" being the marketing manager's general concept of what we were talking about: customized direct mail. We learned Ricoh had once resold an existing print package to their copier and printer dealer that was not well accepted. Thus, the marketing manager had learned the wrong lesson, and was convinced that since their package hadn't sold, there was no market need.

In an effort to catalyze change, our research team member then offered to compare our customer-driven approach with the existing print package, and to return with the results. The comparison afforded us the opportunity to clarify for the marketing management the stunningly bad use experience of the product they selected. It had failed for very different reasons than he originally thought. By building a use story and walking him through the entire use experience, the manager gained an appreciation for the richness of an ethnographic approach, and the distinction between solution value and market relevance. In this case, the product they had selected wasn't relevant to the market opportunity of interest and did not match the customers work practice or underlying needs.

Using less than twenty slides, we educated the marketing manager to the value of user research by dissected the current product interface and revealing the difficultly with discovery as well as the two wizards and twelve other steps needed for the user to conclude that they could not accomplish their initial goal.

This level of explanation, placed in the context of a business plan, clarified the market opportunity we were highlighting, and ultimately gain the support of the business unit to explore new product ideas in this particular market segment.

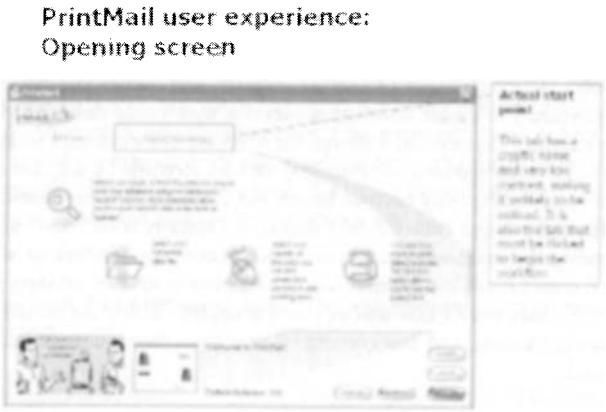

FIGURE 3 By Walking the Product Manager through the Discovery and Workflow Challenges, the Value of User Research became evident.

Element 3- Summarize findings in terms of business objectives - use business language

It is our job to craft our communication with business groups so that they have a means of talking and thinking about our ideas. When we first introduce a project to selected, diverse, corporate mangers, we make sure the message is simple, clean and meaningful to the group as a whole. We have found that we must provide an overview of our work, in a sound bite they can mull over and communicate to others. In this way, when we return with more insights and findings, they have informed the right people. As in the example below, we provide a one-slide overview of each current project, where we state our research objective, it's potential relevance to Ricoh's business, and our main findings (if any) so far.

FIGURE 5 A One-Slide Project Summary Gives the Audience an Overview of the Project Objective, Common User Need and the User Setting

The example above is the initial one slide summary given for studying massive multi-player online gaming. We retain a large amount of space for a picture (of the theme, or the prototype - if it has been built). Especially since we are communicating across cultures, we find photos to be essential.

In our monthly research update, we restate the project objectives and suggest which product groups might want to "join" our project team through our wiki. On our wiki site, each project is laid out with the same eights steps, and rich user data as well as our discussions about the findings area are accessible. All project materials, including photos and video, are indexed so they can be easily searched.

The wiki site is where all the research findings reside for corporate management to access them at anytime in the future, thus becoming part of phenomena Chris Anderson called the "long tail" in his book of the same name.[2] By placing our findings on an internal server that can be searched by any planning person, the value of our findings can stretch over many years, instead of only a few months. It is not uncommon for a planning group to reference a project that is over three years old to review vertical workflows or the identified customer needs.

Element 4- Clearly Identifying Customer Value Reduces Business Risk and Gets "Heard"

No matter where on their perspective lifecycles your industry and technology are, it is paramount to remember business units are built for action. Employees are measured on concrete results, usually in terms of revenue, profit, objectives or a combination thereof. In order to ensure your ideas get "heard", it is important to champion them until you have a few working examples that prove their market validity. This type of proof can take the form of short user case studies, product experience contrasts, Return on Investment (ROI) profiles, adoption rates (for new trial network services), etc.

Our wiki site also has an area dedicated to common unmet customer needs, and the industries where the need has been confirmed. Customer surveys and survey results are nestled with the reports, and linked with the market research completed by past product planning teams that referenced the same industry, or product. However, the most useful form of executive communication appears to be short video clips that are three to ten minutes in length and depict:

- The common unmet need, in a realistic user setting (Figure 6).
- The current market offerings (if not well-understood in Japan already).

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[2] Chris Anderson, The Long Tail: Why the Future of Business is Selling Less of More, (New York: Hyperion, 2006), p. 10.

- The user-derived solution result of our research.
- The metrics used to prove both qualitative and quantitative value (Figure 7).
- A short caption by the highest ranking customer (typically a decision-maker) involved in the research project.

FIGURE 6 This Photo Aptly Sums Up The Issues with Paper Forms in a Clinical Setting – They Provide No Value During An Examination And End Up on the Floor

Short videos allow product planners to witness what a customer site is like, and also to empathize with the many real-world issues that occur. We keep these videos rather rough, because if they are too professionally done the audience may mistake them for commercial product case studies. We try to keep these video vignettes to less than 10 minutes, and we use them to convey the "feel" of the customer site, our project goals, and our project metrics. We save our actual findings for the smaller audience of individuals who can act upon them.

The example below illustrates our research in a health care clinic environment. Figure 6 demonstrates the drawback of using a paper charting system in the clinic environment. Figure 7 depicts the summary of results achieved by working with the end customer to derive a user-centered system with benefits for Ricoh as well.

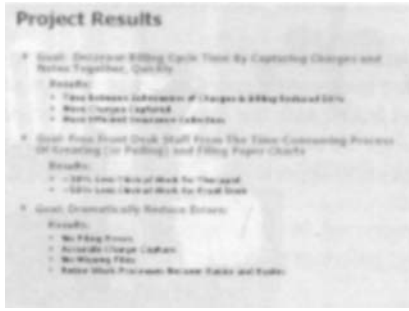

FIGURE 7 Project Results Show How Project Goals Were Achieved

Element 5- Pick Your Battles: Avoid Situations Where User Research Does Not Match The Business Cycle

During the evolution of a market, innovation shifts from technology to customer experiences. This implies that creating new value for customers requires shifting from technology research to the type of customer based design process described here. We have identified three cases where dislocations between research and business naturally occur, and take care to avoid them.

Situation 1- The "Just Ship It" Focus to Gain Market Share Trumps Product Improvement When a Market is Young

As companies move from the emerging stage to adolescence, the business focus naturally shifts away from technology innovation and toward market share capture. Researchers at this stage may have problems getting heard because growing companies are focused on the inevitable race for market share. Geoffrey Moore, in his book Crossing the Chasm, outlines the myriad challenges faced by young technology companies as they grow. He sums up the objective of juvenile companies as "just ship it".[3] The key factor for success is gaining market share as customers make their initial adoption. The market share race in the 1980s between the database vendors like Oracle, Informix, Sybase and IBM is one such example. It seems counter intuitive, but Moore makes a well-researched argument that gaining market share is a critical success factor at this stage in the market lifecycle. A company must first gain a customer, before they can improve the customer experience. Once most buyers make a purchase a move to the customer category, they are loathe to admitting they purchased the wrong product, and are motivated to derive value from it. Only once the company has run the initial rush for market share and established itself, will it have time to consider user research to improve its products.

Situation 2- Profit Potential Plummets as Market Matures – No One is Listening to Research

As products offerings mature, the underlying technology matures. The business unit responsible for maintaining the steady growth curve demanded by Wall Street, no longer has the time, attention or investment dollars for research. The product line undergoes ever-increasing pricing pressure. As the market matures further, and commoditization of production occurs, a new set of competitors arise, and exponentially increase pricing pressure. Margins begin to erode, and the business strategy shifts. The product group that once devoured your research may milk its market position for cash required to dominate other growing markets. In this case, research efforts might be better utilized by shifting the focus to a new product (and technology) in the business portfolio.

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[3] Geoffrey A. Moore, Crossing the Chasm, (New York: HaperCollins, 1991), p. 74*n*.

Situation 3- Misalignment between Customer Needs and Corporate Capabilities

As we explore customer needs, and derive valuable ways of solving them with the customer, we sometimes leverage new technologies or paradigms that have yet to become main stream in corporate engineering environments. For example, in order to best solve a customer need for customized direct mail that could be created, stamped and folded for mailing in-house by the front desk clerk, we leveraged web services architecture. Ricoh had made announcements about offering web services, but had none in operation at the time of this project. Consequently, support from upper executives, and enthusiasm from the channel were not enough to transfer our design concept to product development. There simply was not a services planner available with the background and skill needed to translate our design and value propositions into a commercial web service. Thankfully, because our materials were searchable on Ricoh's internal network, these particular findings are now seeing revived interest within Ricoh.

Conclusion

The experience of the Ricoh Innovations research team suggests that a wide audience of executive, marketing and sales people can benefit from an accurate and empathetic portrayal of the actual customer workflow. The value of findings is directly proportional to their fit with current marketing needs. Moving from description to prescription requires critical thinking to understand the context in which they will be used. Understanding and connecting with the audience who will take the next steps is paramount for success and an exercise for the entire research team. To ensure the appropriate understanding and connecting, ethnographic practitioners need to gauge success by the amount of buy-in and personal ownership for the product's success you find in the receiving organization. We must acknowledge that the business people are experts at execution and that many factors such as channel readiness, compensation plans, channel conflict, related product launches, etc. will impact the success of the final product that embodies your ideas. Only through strong collaborative efforts can research impact commercial product reality.