Using the methods designers use as aids to thinking

The case of

public-private partnerships in sustainable agricultural value chain development

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***Abstract*—In this paper, we share our experience of developing and executing a user centered design workshop for an interdisciplinary team of policy makers, planners, funders and implementers of public private partnerships (PPPs) for programs on sustainable agricultural value chain development. For an audience who will neither practice the design profession nor tend to apply the user centered design process in their day to day work, what can we offer as the essential takeaways from a day spent immersed in the human centered design experience?**

Keywords—Human Centered Design, Agriculture, Interdisciplinary, Problem Framing, Design Thinking Methods

I. INTRODUCTION

In September 2012, we were invited to take a novel approach to problem identification and solution finding [1] within the context of government. Civil servants responsible for PPPs in the area of sustainable agricultural value chain development felt that the existing system had problems enough that they were a regular barrier to impact among the target audience of farmers. They had seen the familiar Venn diagram commonly seen in the field of design and innovation that put the selected end-user at the center of focus for design innovation and the entire solution ecosystem evaluated holistically through the multidisciplinary lens of business, technology and people. The specific words sometimes change such as design, engineering and business but the fundamental concept of customer centric strategy was the same.

Could we take a look at the way public private partnerships set about reaching common goals set by their public funders and discover if there were any fixable reasons why so few such programs ever demonstrated measurable impact or a viable exit strategy?

We framed our design brief's problem statement so:

- What are the barriers to adoption of sustainable agricultural practices that limit their spread and scaling?
    - What are reasons and/or causes of the existence of these barriers?

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Illustration1

Once we rewrote it [2] from a design project perspective we could immediately see it's resemblance to a more common problem formulation for fuzzy front end exploratory user research to inform and inspire the design planning and thus design and development teams. This is:

- What are the barriers to adoption of innovation aka new technology among this target audience?

And this re-framing of the original problem, through exploratory conversations at the earliest stages, allowed us to see the problem in a new light. The PPPs were formed to design and implement programs with specific goals of impact among the target audience of farmers in the developing world (sustainable agricultural value chain development being our particular focus). That is, they resembled any interdisciplinary design team [3] seeking to solve a problem in the form of an innovative service or product (innovation) that customers would want to buy (adopt). And the "new technology" in the case of agricultural value chain development could include Good Agricultural Practices (GAP) or better seedlings etc

Hence we were able to quickly reach consensus on our project's focus and emphasis. While the focus and content of

the processes we wished to explore were important, they tended to be contextually relevant to each individual program or call for PPP funding proposals. Instead, we would focus on the process itself that was followed subsequent to policy making leading to funding calls and PPP formations. Thus we would be able to identify any generalized or systemic problems commonly reoccurring, and prioritize our limited resources for maximum beneficial impact in the initial instance before proceeding to delve deeper into details.

II. Our approach and methodology

A. Introducing Design Thinking

Even as we were focusing on the requirements of the project, we were aware that our first project was something in the nature of an experimental work in progress. Our client partners were willing to permit the process as long as we were able to satisfactorily meet the outcomes required and added a further layer to consider in our narrative development: "Did human centered design have any role to play in all of this and if so, what and where?" as seen from the perspective of government.

We realized that the first impressions made of human centered design as both a philosophy for problem solving and an approach to solution development would be critical to the success or failure of the entire project as the nature of the problem under study required a higher level of cooperation and trust in the unfamiliar process to deliver usable outcomes.

Yet we knew that "design thinking" as a concept had mixed public response and the industry and academia were in debate over both its meaning and utility in any practical sense. The best way to demonstrate the efficacy of any particular approach to problem solving is to solve the problem at hand using it. We were heavily influenced by Charles Owen's Design Thinking [4] when forming the joint team of a science thinker, a design thinker and a policy maker to further analyze and develop these thoughts.

Here, it would be to look at the case of PPPs for sustainable agricultural value chain development for selected commodities in the developing world and attempt to identify what barriers, if any, were imposed by the system itself and would process tweaks help improve the outcome.

B. Introducing our UCSD process diagram

We decided to unpack the common UCD process[1] into a simplified linear diagram only for clarity of communicating the steps in the process that we intended to follow rather than attempt to capture the iterative and dynamic nature of UCD in practice.

Diagram 1

Broadly speaking, we can refer to the entire front end exercises from "Immersion" in the field through to the analysis and synthesis of findings which provide both context and content for actionable insights that bound the solution space before ideation begins as a combination of "User Observations" and "Design Planning". Breaking down the steps allowed us to explain our activities to our audience of our "end-users" without the barrier of industry specific jargon. We just call it the user centered approach to solution development (UCSD) and define it simply as a way to begin the process of solution development (product or service design for eg) from the perspective of the end user. Our primary observations are gathered by exploratory user research in field - unlike design specific user research which seeks to better improve a behavioral or working prototype of a new product or service, exploratory user research may have a guiding theme but no coherent anchor points for initiation [5].

We used this outlined process as a heuristic tool by which to assess the current day scenario of public private partnerships (PPPs) being called together to develop and implement programs for social and economic development. And shared it as our step by step guide to reach the Insights that led us to the successful outcome of our project for our government partners in the Ministry of Economic Affairs and the Ministry of Foreign Affairs of the Government of The Netherlands.

C. Reconstructing the project's narrative in the context of the user centred design process

Any application of the user-centered design (UCD) process requires a designated segment of the population as "the users" among whom one goes out to conduct some form of data gathering in order to identify any gaps in their systems or opportunities to innovate with solutions to fill or bridge these gaps. This selection of a user group also sets focus for the preparation and planning phase and drives the rest of the process through to the traditional outcome of some design concept developed to the required stage.

Our representative group of user profiles were drawn from the multiple stakeholders involved in such PPPs - non profits, government, academia, foundations, private sector and NGOs. Our intent was to use two methods in order to best gather data within the constraints of the project and our access to stakeholders.

D. Process followed

Thus, we began with immersion in the context and operating environment of the problem statement. That is, we made the assumption that for the purposes of this project's requirements, that the members of the PPP constituted the design team that was involved in designing solutions for sustainable agriculture to their end-user, the subsistence or smallholder farmer in developing countries.

- In addition to secondary research, we conducted primary research by means of in-depth interviews with selected representatives from the Ministry of Foreign Affairs, the then Ministry of Agriculture, Economy and Innovation, and other client side recommendations

1 http://en.wikipedia.org/wiki/User-centered_design

(Appendix A). For purposes of design ethnography or design research, 6 to 8 users are considered sufficient for early stage, rapid assessment of the situation [6].

- We then proposed and conducted a small internal workshop with client team representatives, as a rough prototype in order to gather data and make observations on the relevance and impact of the user centered process for solution development (UCSD). This was held on October 23rd 2012 at the premises of the Ministry of Foreign Affairs. Here, we had a representative from JAM[2] who helped us visualize the conversations and identify lacks in the current day process.

- The research team then assembled the data gathered through the interviews and the observations, and together with JAM undertook an analysis and synthesis of the findings in order to identify actionable insights that could inform the design of the formal public workshop held on November 26th 2012. The aim of the public workshop was to enable a dialogue on the challenges articulated in the beginning of this report, whilst also introducing the user centered approach to solution development as an overlay to analyse the problems and bottlenecks in the PPP innovation process. Therefore all participant responses to user centered design as their approach to problem solving (design thinking) were to be documented by JAM team of visual thinkers. The research question for our design team's observations and synthesis was "What aspects of the design process "work" with this mixed group of participants and what didn't?"

E. Public Workshop Description

In order to bring the human-centered aspect into focus, we decided to place the farmer (producer) center stage since the farmer is the primary "end user" of the knowledge and technology for innovations that can offer sustainable development. For the purposes of the workshop, we designed a challenge for the group to work together on in self-selected teams. Each group was to play the role of a specific actor in the value chain, as part of their task, and challenged to design an intervention relevant to that specific user group and commodity. These interventions were to be the introduction of several sustainable (or good) agricultural practices (GAPs) to be adopted by farmer groups. A set of constraints accompanied each challenge based on the commodity selected, i.e. tea in Kenya, coffee in Cameroon, cocoa in Ivory Coast, cotton in India, etc.

We began with an introduction of the rural economy including consumer behavior and purchasing patterns to set the stage with some insights on the end-users and their operating environment. The intent was to invoke thinking on how these aspects of the daily life and challenges faced by the producers were taken into consideration during the design and subsequent implementation of the actual value chain development programmes. Each group also received full design support from JAM's team in order to enable a group of non-designers to engage in the user centered approach to solution development.

Illustration 2

III. Summary of Workshop Observations

The workshop ended with each group presenting their concepts addressing the challenge posed, followed by a group discussion with the audience (the remaining participants) of their assumptions and constraints. An interesting pattern emerged across all the team's presentations: participants found themselves confronted with an inability to put themselves in the shoes of the end-users (the farmers). Across the board, they deemed that area of the value chain too apprehensive for conjecture, some even articulating the inability to imagine the farmer's needs or to claim the mantle of that perspective. That is, they felt the end-user's mindset, values and challenges to be too far removed from their own to be able to make that leap of imagination.

In our attempt to lower the barriers to a human-centered approach to developing solutions, it seemed as though we had inadvertently raised an inherently embedded barrier. We found the teams defaulted towards easy to apply and comprehend assumptions and guesswork.

Participants insisted on directing their problem solving attention to either a more abstract, distant level of thinking (the value chain) or choosing to take a perspective more closely associated with their comfort zone rather than that specified by the design challenge. For example, working on interventions from the point of view of Nespresso rather than the coffee farmer.

This inability to empathize with the end users (the farmers) had implications for the way in which the groups conceptualized their solutions. The approaches used tended to be vertical in nature, bounded by the narrow requirements of the production of a commodity. In their solution development, participants diverted towards general principles (assumptions) such as "tea production provides for income and thus will make the farmers happy" and then broke that down into disciplinary segments such as finance, training, agronomy, trade etc.

2 JAM Visueeldenken (www.jamvisualthinking.com)

The commonly held working assumption in the teams appeared to be that by creating a conducive environment around the end-user (farmer) that related to the specific design challenge they were tasked with, they would be able to convince the farmer to adopt the sustainable farming practices. They defined the elements of this conducive environment by defaulting to expert statements about farmer needs; in effect, substituting expert opinion for the voice of the user. This gave them a sense of control they required to make design decisions, relieving them of the uncertainty of the exercise and the leap of imagination to step, even hypothetically, into the farmer's shoes.

The upshot was that the teams created a logical construct for their proposed solutions which circumvented the farmer, working around their own design constraint of not being able to apply user insights. We then took a holistic look at the entire ecosystem of the multi-stakeholder PPP initiation, development, implementation and impact assessment process.

Synthesizing the findings from our in-depth interviews and observations made during the workshops held with Ministry officials, we can cluster the problem areas in the process broadly under the following headings:

- Assumptions drove decision making and choices
- Fragmentation of narrative around common goals and vision
- Willingness to respond hampered by constraints of timing and scope as well as lack of timely feedback loop during implementation process
- System not designed for informal economy prevalent in rural developing world

A. Assumptions drive decision making and choices

During the workshops it emerged that the participants were incapable of understanding the end user's – the farmer's – problems and challenges from his/her point of view. This inability is a major hindrance to achieving truly sustainable solutions which not only suit the farmer's actual situation, but also meet with her/his approval and support. Workshop participants simply applied their own familiar paradigms to the tasks presented, thereby failing to successfully complete those tasks.

Top-down, abstract assumptions generally result in crafting poor solutions for poorly understood problems at best, and creating solutions for non-existent problems at worst, It is essential that the lack of understanding, which underlies mere assumption be recognized, and addressed through listening to the voice of the end user.

B. Fragmentation of narrative around common goals and vision

As a result of allowing top-down, abstract assumptions to drive the decision making, choices about the allocation of resources and the direction in which processes are to be guided will not prove a good fit with the actual challenges posed by the end users' actual situation. Resources are likely to be misallocated, and goals are neither understood nor shared by all stakeholders and cannot therefore can only be partially achieved.

C. Willingness to respond hampered by constraints of timing and scope

A further issue is that even when goals are in fact shared and solutions are supported by all stakeholders, contingencies and emergencies will inevitably arise requiring rapid if not immediate response. The absence of clear feedback loops to obtain and process adequate and timely information from users causes an important barrier to a) defining the correct problem to solve, and b) adapting to progressive learning about users' needs and circumstances.

D. Incomplete bridge between formal and informal operating environments

The bulk of the developing world's farmers are part of a closely linked, rural informal economy that is more in tune with the seasonality[7] of the natural year (and the climate) than the calender based schedules of the formal economy. Without the framework based on understanding this difference, PPPs focusing on sustainable agriculture value chains overlook the need to respond nimbly and with a degree of flexibility echoing the relationships between timing, money and a trusted social network that characterize the rural economy.

IV. DISCUSSION

Earlier we had mentioned that our parallel inquiry had also been to assess the potential role of human centered design (UCD methods[3]) in this context of government's role in Public Private Partnership formation for large scale international development projects in sustainable agricultural value chain development in developing countries.

A. Synthesis from the User Centred Design perspective

Given our findings as mentioned above, we took a closer look at these challenges which acted as barriers to programme impact and success among farmers from the perspective of the designer, that is, thinking like designers. We identified the ways that our representative group had experienced the difference between our approach and their existing ways and clustered them accordingly:

- Exploratory nature of design research

  The nature of the interviews conducted as part of the process meant meeting were held without an agenda, following an unstructured and conversational approach to exploring the interviewees sense of what the problem was and where the challenges might lie. This difference was explicitly described by our client team as an initial discomfort at the uncertainty that was later appreciated for its creative possibilities in sense making and share narrative development.

- Importance of the farmer as stakeholder

3 V.Kumar (2013) 101 Design Methods: A Structured Approach for Driving Innovation in Your Organization

As our workshop observations emphasize, the biggest challenge the multidisciplinary teams of representatives from stakeholders in PPPs faced was the leap of imagination required to perceive the end-user's point of view. By reframing the entire conversation of sustainable agriculture, market creation and value chain development at the last mile of the global food security ecosystem in terms of human centered design thinking, we were consistently able to replicate the gap in each process or stage left by the lack of agency allocated to the target audience of these programmes. Where is the farmer (user)? became our rallying cry and what does she want?

- Becoming user centered or customer-centric

  We were able to demonstrate the likelihood of programme impact if the end user's aspirations and motivations were influential drivers of the design of beneficial services, products or other interventions. Stakeholders took away the clear understanding of the difference made to programme impact and success by giving farmers the centre stage. That is, giving voice to the end user who is to be considered as much a stake holder in the programme development cycle and its success as everyone else involved i.e. emphasizing the user's agency (Norman 1986)

- Rapid prototyping through Sketching and Modeling Concepts in 2D and 3D

  Being able to quickly build and iterate to see what will work or makes sense. We used post it notes with steps of the process to demonstrate how the order of steps might change or to model a use case. We were particular in our collaboration with JAM visual design thinking; a studio consisting of industrial design graduates self trained to use their rapid sketching and illustration skills to render abstract concepts from brainstorming sessions, group meetings and design charrettes. They were invaluable in demonstrating the power of visualizing concepts and illustrating context and use cases as well as capturing entire scenarios as a form of documenting group dynamics in brainstorming sessions while lowering barriers to shared understanding and consensus. They were the clearest example of design thinking in action which benefited all stakeholders immediately and were immediately requested to follow up with organizations of different types. Using JAM designers extensively enabled a wider variety of communication of complex and abstract concepts across multiple stakeholder worldviews and agendas. Such rapid sketches lowered the barriers to sense making, story telling, scene setting and framing the problem in various ways while assessing which combination of elements was optimal.

Illustration3

- Non-Linear, Iterative, Ambiguous

  The design process is not like a mathematical formula which can be neatly followed from problem statement to one right answer or a set of answers within a range. It emphasizes lateral thought, is iterative in its approach to sensemaking and solution finding and has deliberate and extended moments of ambiguity. This pause in chaos was the most challenging aspect and led to observed behaviours of "pushing the burden of uncertainty further downstream" as explained by one of our interviewees.

B. Role of Human Centered Design

If we list once more the key findings from all the observations made across the PPP formation process, and reflect on them from the design thinker's point of view, we see a pattern emerge. We have highlighted this in italics:

- Assumptions drive decision making and choices (*voice of the user*)
- Fragmentation of narrative around common goals and vision (*coherent story for all stakeholders*)
- Willingness to respond hampered by constraints of timing and scope (*nimble*)
- Lack of feedback loop during implementation process (*responsive*)
- System not designed for informal economy prevalent in rural developing world (*Flexibility*)

The discipline of Design Planning, integrating elements of business and design at the fuzzy front end of innovation strategy, offers some tools for sense making & insights but others, such as observing users, are fundamental to all of human centered design. When we write out the pattern we see in the cluster of gaps identified in the current PPP formation process as barriers to impact among beneficiaries (barriers to adoption among end users) we find that we are essentially

describing the designer's methods for thinking in teams and tools for collaborating and cooperating on abstract concepts.

Thus, the missing voice of the user which the User Researcher provides in a design team, or a coherent story for all stakeholders that the conceptual designer manifests in shareable format, or nature of rapid prototyping and iterations implying a nimble, responsive nature that can embrace periods of ambiguity in order to keep the flexibility of the solution malleable throughout the development life-cycle all the while gathering feedback.

The value of judicious and selective application of relevant and selected methods and frameworks from the human-centered design planning toolkit is in their ability to impact the alignment of strategy and deliverables from the top to the identified needs and requirements of the end user, in the context of his or her operating environment. The role of human-centered design and planning then is to offer holistic roadmaps for manifesting envisioned solutions in a tangible, self-sustaining manner.

The difference in outcomes by adding some human centered design thinking when approaching the problem finding and solution development aspect of Public Private Partnerships for sustainable agricultural value chains in developing countries could enable an opportunity for just the right boost to those farmers poised at the tipping point of entering the middle class.

We got a hint of this during our feasibility study conducted in a subsequent phase to ensure we also had the farmer's perspective on our hypothesis. Our team was warmly welcomed by farmer's cooperatives when they heard we were there to gather their opinions and challenges in order to better design interventions for their needs.

C. *The experience of the Human Centered Design process from the non designer's perspective*

The design perspective has revealed several discrepancies on the participation of non-designers in the design process as opposed to trained designers. The question here is what underlies this phenomenon? To understand this the designer has to take the fact in consideration that non-designers, participating in let's say PPP's, are part of a different system of human interaction. There are several differentiators at play, but the leading one in our case is that most members of PPP's reason from the perspective of proven technology and knowledge within their own context. This difference is expressed in various facets pertaining to the PPP context. These are not separate facets but interwoven, and interact with each other to provide the background for human interaction within this context.

- Politics and intent

  Even though the political landscape on the issue of development is changing from aid to trade, the premise for technology and knowledge application remain more or less the same. Under the aid paradigm, the driving intent was to utilize our technology and knowledge for the betterment of our partnering developing countries. With the shift to trade the intent has more or less remained, but the nuanced difference is that the focus is on opportunities of mutual benefit. The broad challenge of market creation that is required under trade conditions, remains addressed however, and is impossible for PPP's to influence.

- Funding criteria and mitigating uncertainty

  Public funding, utilized to contribute to PPP's is bound to criteria on delivery of pre specified impact. Projects are being treated as implementation and execution projects, rather than exploratory projects that require research and fresh orientation. Projects that want to include exploration and research activities to mitigate uncertainties are generally not granted any funding. PPP's have no abilities to influence these criteria, which are often non-negotiable.

- Understanding the context and conducting research.

  As a result of the execution orientation, PPP's generally consist of partners able to deliver on the project's plan. The understanding of the actual socio-economic context is considered as a given, to be contributed by each partner respectively on their area expertise. Projects are rendered to a question of pooling the right mix of parties together, rather than creating partnerships that are able to explore the opportunity space, and from that exploration bring together the required understanding from their respective disciplines of expertise. It's the difference between dividing the work over different expertise's, and joining the various expertise's in a process of co-creation.

- Perceptions on experimentation and piloting

  People in PPP's operate from the perspective that enough research and pilot projects have been done to understand what works and what doesn't. Any experimental activity which is proposed in this context is considered as repetition, and can't be argued to contribute to learning.

The fact that these facets are not causally linked, but relate in mutual dependance, makes it very difficult for people in PPP's to create and embrace alternative ways of working, using different tools, assumptions, metrics, and overall language than they're accustomed to.

V. FURTHER RESEARCH AND DEVELOPMENT

It has been generally accepted that development aid, such as sustainable development programmes in agriculture, are not as effective as they should be. In recent years, there has been a shift in mindset from "Aid as charity" to "Development as business" largely due to this recognition, offering new impetus to achieve results in longer term social and economic development.

One such focus is on the development of emerging markets among the lower income demographic in the developing world. The rationale is that if we are able to build and sustain for-profit businesses in these markets, it contributes to local

development as well as offering opportunities to benefit from the expected cycle of growth. This is also the underlying premise of agricultural value chain development.

This shift in orientation has important implications:

- First and foremost is the shift in thinking about the end-users for which these programmes are meant, from beneficiaries of international aid and charity, to collaborators and co-producers in a value chain of economic and social benefit.
- Second, consumer facing businesses have always sought to understand their target audiences and identify unmet needs and/or the opportunities for innovating with new products, services or business models, in order to improve their success rate in the marketplace.

Thus, as development aid reorients towards increasingly taking a business perspective, it follows then that a greater emphasis on end-user insights and consumer behaviour, will also be required in order to improve the impact and outcomes of relevant and appropriate programmes. While pure profit alone has never been the intent or aim of such enterprise development for poverty alleviation, neither can programs continue to be solely supported by donor funds. Self sustaining programs require end users to embrace and adopt the schemes, continuing to deliver outcomes long after the end date of the project.

Our proposed solution of a customized set of tools to improve the outcomes of the PPPs in sustainable agricultural value chain development was based on the findings observed during the workshops covered earlier in this paper. We said:

The commonly held perceptions of lower income (BoP) farmers in rural Africa were decades out of date, and that current day technologies and socio-economic development had far outpaced the obsolete image of "the farmer". This worldview needs to be updated and revised by in-depth exploratory user research, segmentation of the rural population to better refine PPP targets and a platform for dialogue and relationship building to be established to help close the feedback loop leading to more responsive adaptable program implementation cycle.

This future research initiative has been scoped into two broad areas:

- the need to conduct exploratory user research, using design ethnography methods, in order to refresh and bring up-to-date our perception of "the farmer" at the bottom of the pyramid who was the target beneficiary of the process and the PPPs; and
- the recommended development of a platform for dialogue and exchange of knowledge that could close the feedback loop, utilizing ubiquitous technology such as the mobile phone.

We are currently in the final stages of securing funding for this research proposal.

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Illustration 1

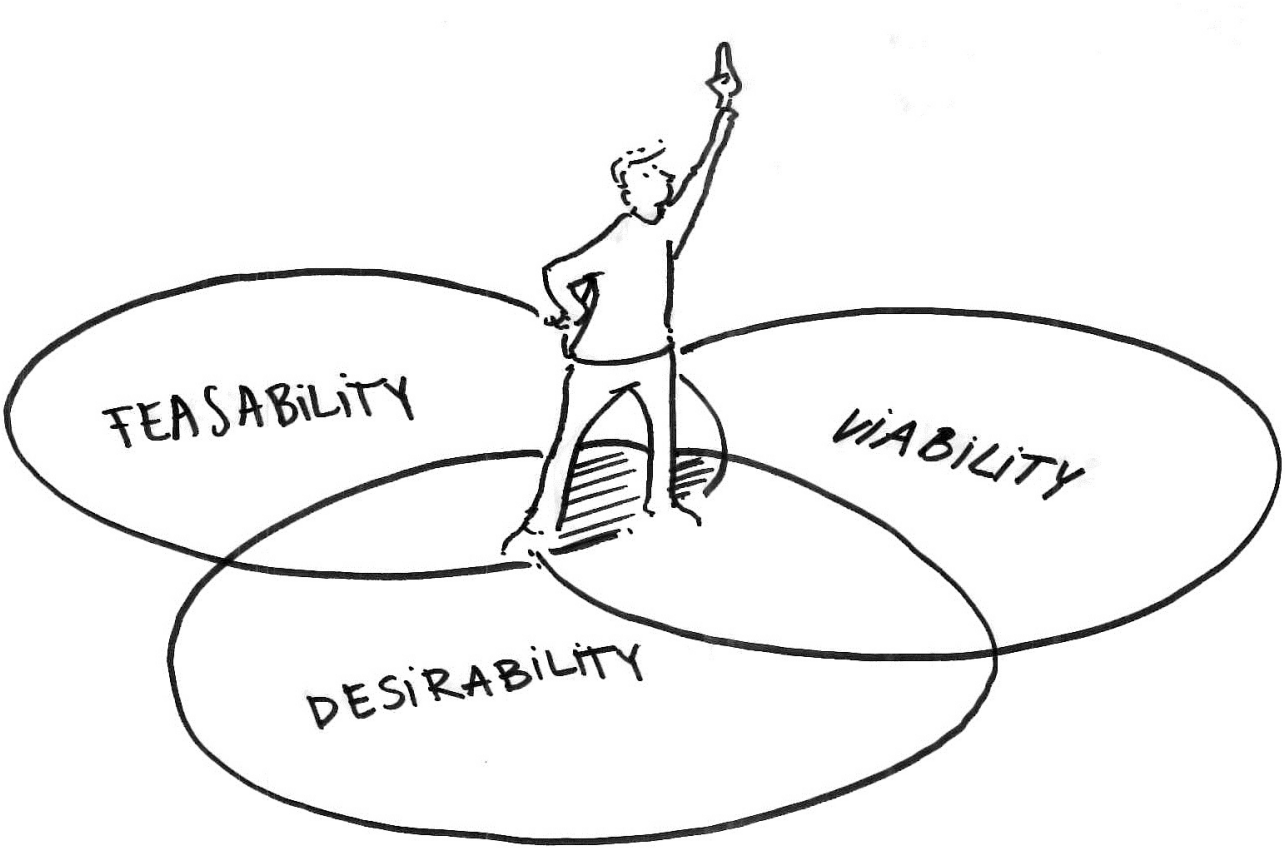


Diagram 1

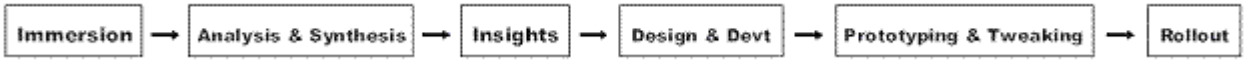


Illustration 2

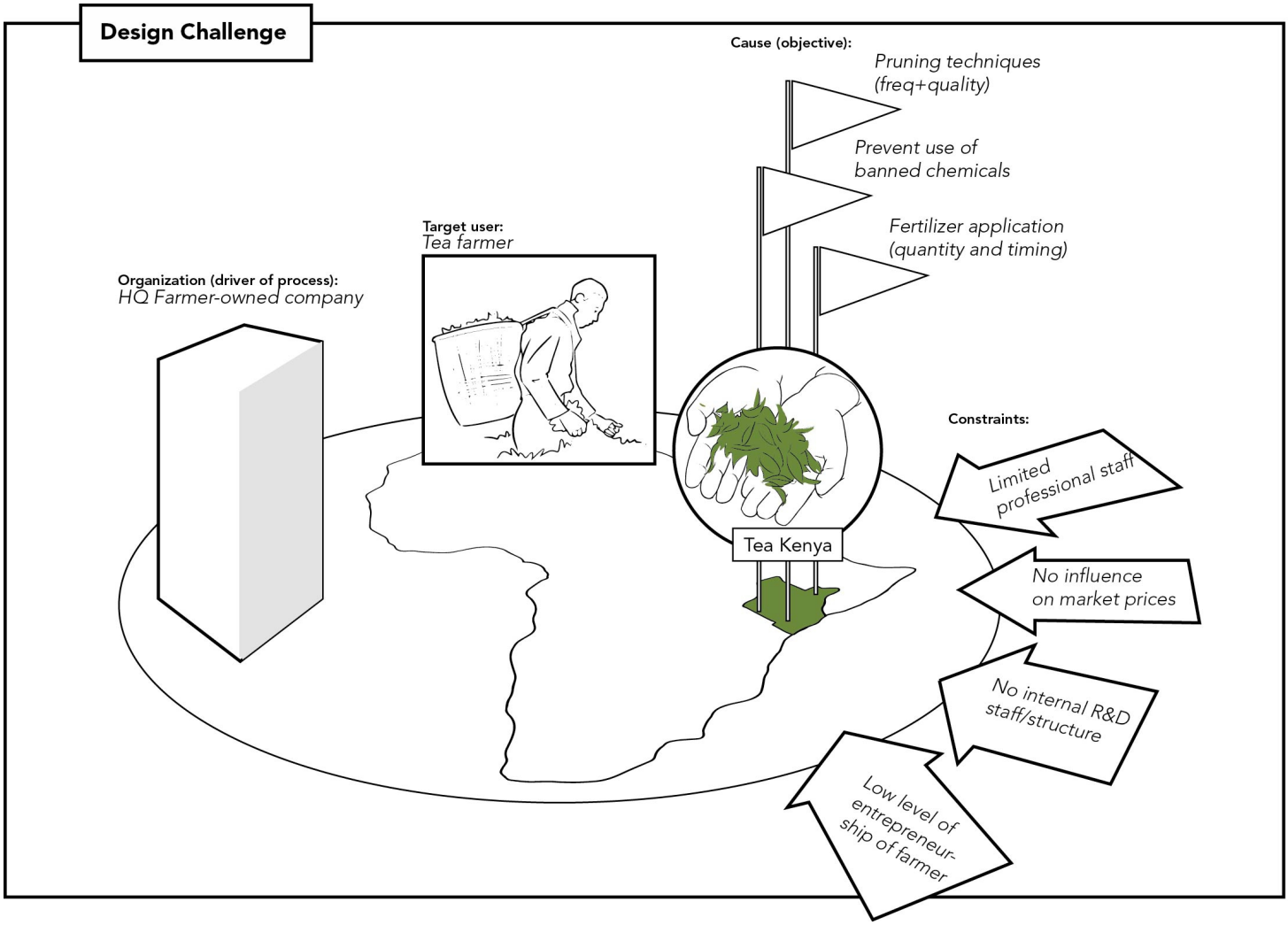


Illustration 3

