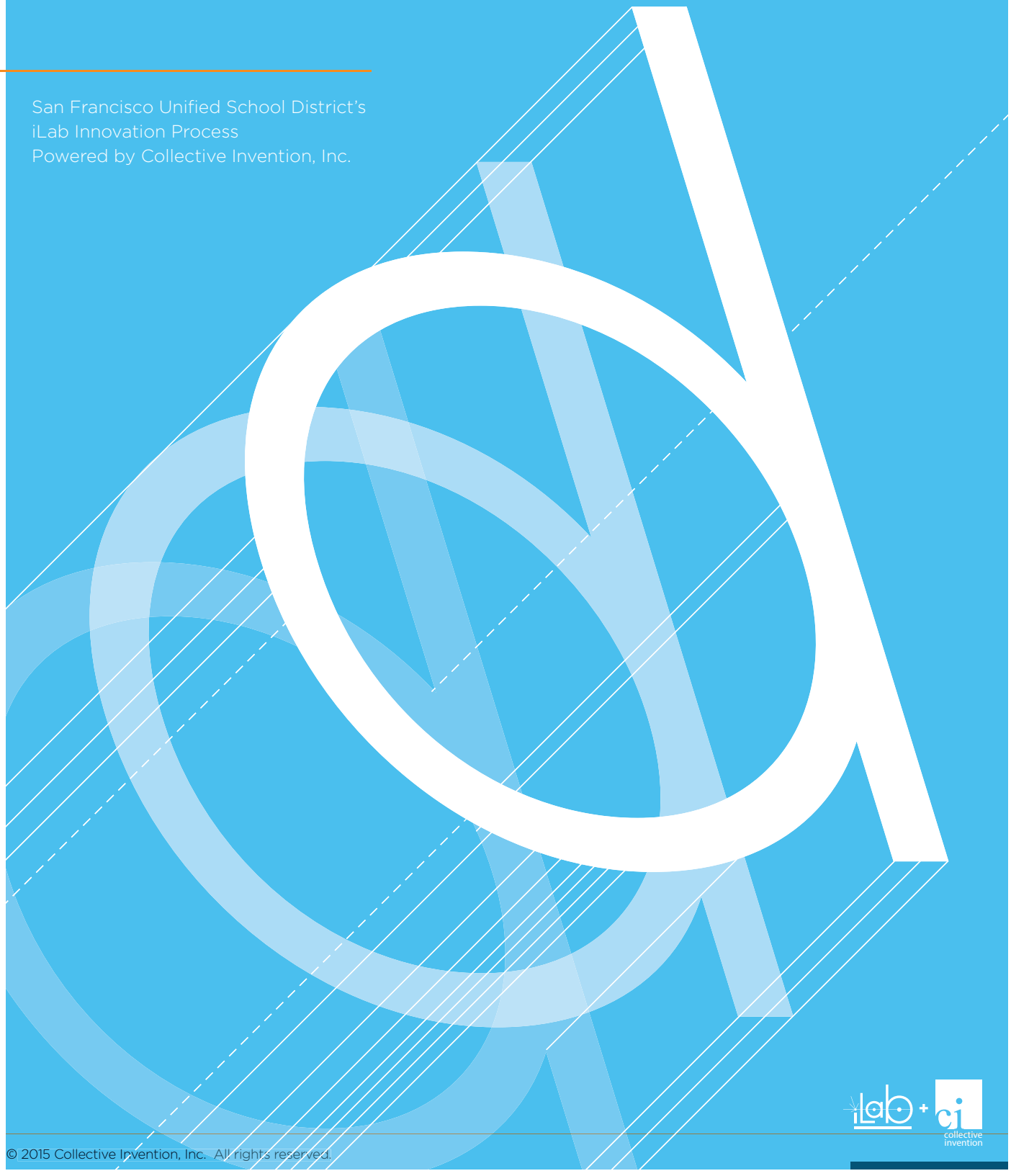
The 3D Process

San Francisco Unified School District's
iLab Innovation Process
Powered by Collective Invention, Inc.



Introduction

Welcome to San Francisco Unified School District's innovation process, hosted by The SFUSD Innovation Lab (iLab). The iLab launched in Fall 2014, and is a pivotal investment in the development, testing, and refinement of Vision 2025-aligned pedagogies, school models, policies, and practices. Our leading values—inspiring collective genius, fostering innovation, empowering our people, and impacting kids—guide our work. We offer seed funding, training, technical support, and process coaching for multidisciplinary teams with design ideas who commit to working collaboratively to develop and implement promising approaches that can inform broader systemic strategies.

Working with Collective Invention, Inc. the iLab team has developed a supportive experience—the 3D process—that will take teams through a rapid cycle of innovation—including research, design, and prototyping—in order to develop solutions to a variety of problems of practice. This workbook contains the background information, guides to exercises, and templates that you will need to go through the process.

The 3D Process

Discover

The Discover phase of the process invites participants to learn about the ways that similar challenges are solved, get inspiration from inside and outside the education field, and to practice a user-centered approach to solving problems of practice.

Define

The Define phase of the process translates insights gathered from the observations, engagements and scanning exercises to define, refine and make meaning, and to identify design constraints.

Do

The Do phase of the process asks teams to "work in a different way" by rapidly prototyping solutions, testing and iterating their designs.

About Collective Invention

Collective Invention is a multi-disciplinary consultancy dedicated to innovation for the common good. The practice is focused on three key areas: education, sustainable living, and local economies. Based in San Francisco, Collective Invention works with a range of organizations, from government departments and school districts to private sector clients and civil society, to develop both the cultural characteristics and the practical skills necessary for systemic innovation.

Collective Invention has partnered with SFUSD to create Vision 2025, and to help build the innovation capacity within the district that will make V2025 a reality.

Discover

The Discover phase of the process invites participants to learn about the ways that similar challenges are solved, get inspiration from inside and outside the education field, and practice a user-centered approach to solving problems of practice.

This phase includes physical and virtual learning journeys (or expeditions) and an ethnographic approach to identifying user needs. The latter uses observation and interviewing to learn more about the ways in which users are currently interacting with, or experiencing the dilemma or aspiration posed in the design challenges. Discovery activities are also designed to build empathy in team members. Tools, resources and trainings teach participants to use ethnographic research, make unbiased observations using low-inference data, and translate their insights into a deeper understanding of the problem and its root causes.

Research the Problem

Einstein famously said if he only had an hour to save the world he would spend fifty-five minutes defining the problem and only five minutes finding the solution. The point here is that a well defined a problem gets you nearly to the solution itself. A problem in its simplest definition is the difference between the current state and a future desired state. However, getting to a desired state is not always simple. Often, problems continue to exist because the solution is not easily created, if it were it would likely be solved already.Instead, most problems are complex issues within a larger context. Therefore unpacking a problem and understanding its root causes will offer clarity about what ultimately needs to be solved.

Brainstorm Problem Statements

Step 1

Any innovation is a response to a set of problems or challenges. Together we'll determine which problems to focus on. The first is for you to brainstorm all the problems you'd like your redesign to address. For guidance on how to run a brainstorming session read over the Brainstorm cheat sheet. (pg. 7)

Select

Step 2

Select the most important problem statements to address. Go over the Problem Statement cheat sheet (pg. 6) for tips on writing a problem statement.

1.

2.

3.

How Might We

Step 3

Using the "How Might We" cheat sheet (p. 8), create "How might We" questions for each of the selected top problem statements

Problem Statement Cheat Sheet

Problem Statement

When you think about what the problem is, think about the current state and write down the main thing that comes to mind. Expand on this initial idea by asking yourself the following questions:

- **Who does it affect / does not affect**
- **What does it affect / does not affect**
- **How does it affect / does not affect**
- **When is it a problem / is not a problem**
- **Where is it a problem / is not a problem**

Rewrite your problem statement based on the anwers to the previous questions.

When you think about what the desired state is, write down what comes to mind here. Then combine the revised current state with the desired state into a single statement.

Finally, review your new problem statement against the following criteria:

- **Focused on only one Problem**
- **One or two sentences long**
- **Does not suggest a Solution**

Adapted from Thinkinghow.com:
http://thinkinghow.com/writing-a-problem-statement/

Brainstorming Cheat Sheet

1. Focus on quantity
This rule is a means of enhancing divergent production, aiming to facilitate problem solving through the maxim quantity breeds quality. The assumption is that the greater the number of ideas generated, the greater the chance of producing a radical and effective solution.

2. Withhold criticism
In brainstorming, criticism of ideas generated should be put 'on hold'. Instead, participants should focus on extending or adding to ideas, reserving criticism for a later 'critical stage' of the process. By suspending judgment, participants will feel free to generate unusual ideas.

3. Welcome unusual ideas
To get a good and long list of ideas, unusual ideas are welcomed. They can be generated by looking from new perspectives and suspending assumptions. These new ways of thinking may provide better solutions.

4. Combine and improve ideas
Good ideas may be combined to form a single better good idea, as suggested by the slogan "1+1=3". It is believed to stimulate the building of ideas by a process of association.

In addition:

5. Write one idea per post-it note
By limiting each post-it to one idea we can more easily move individual ideas, combine them with others, etc.

6. Decide in advance when/how you'll converge
Groups are freer to think divergently and generate multiple options if they feel assured that there is a reliable process ahead for identifying those ideas with greatest promise and converging on a plan of action.

"It is easier to tone down a wild idea than to think up a new one."

—ALEX OSBORN
THE FATHER OF
BRAINSTORMING

Adapted from Osborn Brainstorm Process (citation: Osborn, A.F. (1963) Applied imagination: Principles and procedures of creative problem solving (Third Revised Edition). New York, NY: Charles Scribner's Sons.)

collective invention

"How Might We" Cheat Sheet

Our goal in this step is to translate problems into questions that stimulate our innate curiosity.

A "good" question is one that unleashes the imagination of a cognitively diverse team. We are looking for questions that activate the unique heuristics—the ways we address challenges and form mental models—of each member of the team so we can collectively generate better ideas and better solutions.

Another feature of a good question is that it helps move us from a fuzzy or ill-defined sense of the problems we face particular possibilities for active exploration.

Types of "how might we" or "what if..." question

Knowledge and Understanding

- How might we learn about X or understand Y?
- What if we better understood/ knew how to Z?

Action

- How might we change X?
- What if we did Y?

Scale

- How might we increase or reduce X?
- What if we increased or reduced Y by tenfold?

Perspective

- How might we look at this from X's point of view?
- What if I were doing Y myself— what would I want or need?

Reconfiguration

- How might we break this challenge down into pieces?
- What if we put X and Y concepts/ approaches together?

Research User and Stakeholder Needs

A User-centered Approach

User-centered approaches are driven by a belief that solutions rooted in the needs of people who will actually be using the design will better address the problem, and are more likely to be adopted. User-centered approaches always involve ways of researching user needs, which can range from administering surveys, to ethnographic studies. Because people are not always able to express their needs – some needs are tacit, and we are not aware that we have them – surveys, self-reporting, and diary studies, for example, may not yield the most useful information.

User-centered approaches can also differ in the role that users play in the work, ranging from users as subjects of research to having users as participant-observers and as co-designers on the team. Decisions about the role that users play are usually driven by a combination of beliefs (a belief that users should be active partners in the design process, for example, because the result will be better or because it will avoid a sense of users being passive recipients of design) and by logistics (can your users make the time to be a part of the process, and can they be true participants, for example).

Using Ethnography

In order to acknowledge the context of the problem space, and to help identify tacit needs, we advocate the use of ethnography for user research. Ethnography is a form of anthropology, classically identified by prolonged immersion in the culture under study, and by the generation of 'deep, or 'thick' descriptions of that culture. As ethnography is undertaken in contemporary research projects the time lines have been radically shortened and the 'deep' descriptions may be presented through multimedia.

Ethnography seeks to:

- **Understand a culture in its own terms**
- **Study the daily routines of people's lives**
- **Understand underlying beliefs and values**
- **Surface descriptions, norms, rules, meanings**
- **Uncover a group's needs (explicit and implicit)**

Ethnographers use observation, interviewing, the collection of artifacts, and sometimes participation to gather information. The process is characterized by the following:

- **An openness to the culture/individuals/situation being studied**
- **A belief that everything is data**
- **A focus on the 'here and now'**
- **And a rigorous interrogation of the researchers' assumptions**

When we are researching in very familiar situations it is even more important to try to put aside our ready assumptions and see the situation as if we were seeing it for the first time. Try to look at everything with fresh eyes, and ask lots of questions.

Work with others

It is good to do this kind of work in small teams of 2-3 people if possible. Everyone will see something different, and it is difficult to take in a lot of information at once. In the small team you can trade roles, with one person interviewing, for example, and another documenting. (However, for interviews, aim to have no more than 2 researchers to 1 interviewee).

Begin with observation

Before interviewing spend some time simply observing the situation you are interested in. Although you may have some specific things you are looking for spend time at first observing more broadly and noticing everything you can. The first step to looking with fresh eyes is to become as receptive as possible to what is in front of you.

For more information read the article Developing 360° Attention (pg. 26)

Time/Duration	Activity	Who	Social-Emotional Impact	Notes

The questions below are suggestions. Depending upon your project you may need/want to add other questions, or to edit these

Questions for students:

- What you are doing in class today?
- What kinds of things interest you about this work?
- What kinds of things frustrate or bore you about this work?
- (Draw upon your observations) I noticed that you were doing x. How easy or difficult is it do this?
- Is there another way you would like to be able to do this?
- If you could change this class in any way, what would you change and why?
- When this activity works well, what has changed? (This could be a learning outcome, the creation of something, more of something, or less of something) And how do you feel?

Questions for teachers

- What are your learning outcomes for this session?
- How would you describe the range of students you have in this class?
- How do you typically address that range of interest and need?
- What kinds of student needs do you find it most difficult to meet in this setting?
- If you could change anything about this session what would you change?
- [If not already answered] What would that enable you to do differently? What different outcomes do you think that would have?
- When this activity works well, what has changed? (This could be a learning outcome, the creation of something, more of something, or less of something) And how do you feel?

At the end of this assignment you will have:

- Observation notes and photographic/video documentation of the people you for whom you are designing
- A log of the kinds of activities people are doing, where they are blocked in doing those, and what kinds of 'work-arounds' they may have developed to help
- A sense of the people for whom you are designing, and some sense of their needs (the needs expressed in interviews will likely be the explicit needs they are aware of, we will also go through an exercise at the charrette to help you determine their implicit needs)

Research Possibilities

Field Expeditions

Field Expeditions, also called "learning journeys", are disciplined approaches to observation, learning and sense-making. They provide fascinating opportunities to meet pioneering individuals and innovative organizations. Indeed, such journeys are used regularly by international government agencies, business strategists and industrial designers as they explore new markets and delivery models. But more enduring is the experiential learning Field Expeditions provide. Participants apply practices of self-reflection, observation, and multi-modal documentation; collectively and as individuals they become more thoughtful analysts of what they see, hear and learn.

This section describes how to prepare and participate in the field expedition, a process that will involve a commitment to inquiry, willingness to defer judgment, and the use of both collective and individual reflection to make sense of what we're learning together.

Generally, Field Expeditions are born out of a couple of different motivations, for example:

A sense that the answer to a pressing organizational or systemic problem can't be located within the constraints of operative mental models or standard operating procedures. In other words: a hunch that we won't be able to get out of our own way enough to see valuable opportunities, either because our culture won't allow it or because we simply don't have the right information or experience.

A belief that dynamic social phenomena are better appreciated in situ, than at third hand.

Sometimes, Expeditions are a response to intuition (we sense there is something out there we need to learn about, but we're not sure how to describe it); to untested hypotheses (we believe that we have a viable solution but need to learn from others who have passed this way before us); to curiosities (we just have to learn more about this, even if we don't know why it's important yet) or even to relationships (someone we trust knows about this place, and she mthinks we ought to connect with them, for example).

Expeditions involve both direct inquiry and contextual inquiry. We need focal questions as part of our direct inquiry, defined for our purposes as both the starting point and the touchstone for inquiry, and open questions that allow us to engage with the unanticipated and tangentially influential.

Direct inquiry requires us to have a fairly clear sense of what we want to know and learn in relation to our overall problem statement; focal questions ensure that we choose Expedition sites that will help us learn those things expediently and that, if applicable, we use our hosts' time wisely.

Contextual Inquiry At the same time, we expect (and hope!) that Expeditions lead us into unexpected terrain, that we are stimulated to make surprising connections, and that our understanding of our problem space is actually enhanced—and maybe even altered significantly. Focal questions help us remember our in-going learning agenda but should not prevent us from

doing the kind of open-ended contextual inquiry that can lead to real insight and opportunities for innovation. For example, following our curiosity (what questions do we have now that we didn't have before?) and noting the metaphors and analogies that come to mind will help us make sense of what we're seeing. We may also do modified breach experiments, substituting very different groups of "users" than the ones we are encountering so we think about the value of what we're seeing through multiple filters.

Review at least 3 articles on personalized learning examples, and use these to identify some interesting exemplars. Try to get some experiential information from the exemplars, either by finding videos online, reviewing blog posts, or calling the people involved and doing a quick phone interview. At this point you are looking for: inspiration; lessons learned; and any key ideas and solutions that you might be able to adapt. Capture your learning for the rest of the team using the template below and/or a short slide deck, or with some other form of graphic organizer.

Analogous sectors For this part of the assignment you are also looking for inspiration and ideas or solutions to adapt, but you will be looking at non-education examples. Think of sectors of work in which personalization is important. The healthcare sector is often an interesting comparator for education, but also think further afield – what is happening in retail with fashion, music or food, for example? What is happening with online news content?

Capture your learning in the same manner as you did for the education examples.

Descriptive Words

3-5 words that encapsulate this site/experience

Learnings

What Questions or Ideas Do I Have Now That I Did Not Have Before?

Define

The Define phase of the process translates insights gathered from the observations, engagements and scanning exercises to define, refine and make meaning in order to solve the problem of practice. In addition, participants will deepen empathy for their end-users. This section relies on intuitive, empathic principles and the collective genius of the group. At the end of this portion, teams will return to and refine the “How might we?” question, and develop it into a question they can truly design and test for

User Needs

Dimensions of Difference

Dimensions come from the attributes of users, and from themes emerging from your research. They may be themes that occur frequently when talking to a variety of different people, or they may only be mentioned a few times, but provide an interesting counterpoint to another theme. As a team brainstorm the dimensions that define your target users in relation to one another.

Dimensions of Difference Exercise

Drawing upon your research (and other knowledge if it seems very relevant) identify all the ways in which your users are different from one another, by creating a set of polarized dimensions, e.g. young—old. For each dimension draw a line and label the dimension and its poles (e.g. age on the line, young-old at opposing poles).

Almost everything is more relative than the dimensions suggest, and you can place your users at various points along the spectrum, however, the point here is to ensure that you are thinking about differences between your users. Your design will have to work for a range of people, and for this part of the work differences are more important than similarities.

Discuss each dimension, and then do one of two things to help with the next stage of creating personas:

- Either vote on the top 3-5 dimensions and use these to create 2 composite personas who are as different from one another as possible
- Or, use all the dimensions to create more complex characters

Creating Personas

Personas are characters that help us to focus discussions about needs and wants when exploring an issue, or designing a product or service. Ideally they are drawn from research, to help analysts and creators step outside of their own assumptions.

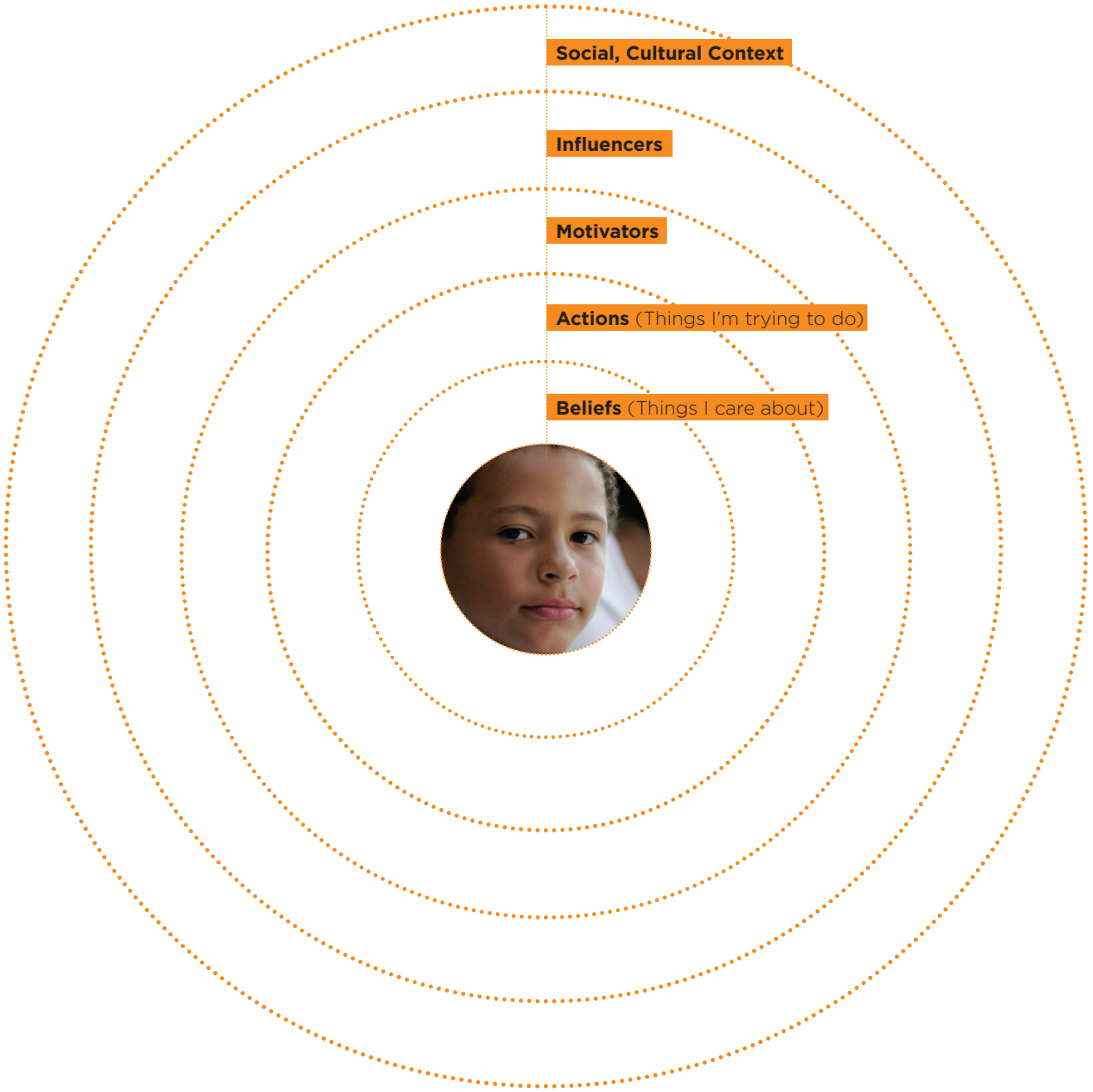
Personas can be drawn directly from research, i.e. a person we interview in the field becomes one of our personas, or they can be fictitious characters, composites drawn from real people. At Collective Invention we use both kinds depending upon the project.

From your Dimensions of Difference work pick 2 (or more) people who are your target users, or create 2 or more composite characters. These should be as different from one another as possible. The design philosophy behind this idea of difference is that if we can develop a solution that meets some widely ranging needs, then we will create something that will work for the majority of users. This is similar in spirit to the principle of Universal Design that states that if we design something for people who are, for example, differently-abled, we will design something that also works really well for others as well.

Persona Mandala

Create a Persona Mandala for each target user. Using "I" statements, rather than "he" or "she" write information from your interviews and observations on post-its—1 idea per post it! —and place in the appropriate area on the mandala. The idea is to build out as full a picture as possible of the "character" in question. You can also post photos or sketches from your observations.

Use one of the picture post-its—or a photograph if you have one—to place in the center of your template, and give your persona a name. List the key needs your persona has and any dilemmas she or he may need to manage. The mandala will be a visual reminder of your users, and their needs, as you begin to design.



Clarify the Problem

Now that you have deepened your understanding of the people you are designing for, return to your HMW statement and refine it to better reflect their needs.

Identify other constraints

Systems mapping: This piece of the process can be done at this point, or at any time during the prototyping iterations. As you begin to get a sense of what your design will need to do you may also be thinking about the other systems it will interact with. Think about the systems changes that will need to happen in order to support the prototype and chart them in a systems map.

Think of the different systems this design will interact with—brainstorm on post-its, one idea per post-it. These could include the bigger system of the school itself, specific parts of it, e.g master schedule, food service; district systems such as transportation, technology purchase and/or support; or more informal systems such as parents & caregivers, or community partners.

- Draw an informal systems map with something representing your design in the center.
- What different systems will this design impact? Post those around the RH side of your paper, and link back to the design with a colored line. Annotate each system that will be impacted with what you think that impact is likely to be, whether beneficial or not, and what might be done to remedy any negative impacts.
- What different systems will impact this design? Post those around the LH side of your paper, and link back to the design with a different colored line. Annotate each system that will impact with what you think that impact is likely to be, whether beneficial or not, and what might be done to remedy any negative impacts.

As you are prototyping you can use this map to begin to think of features that your design might have that may either take advantage of systems for support, or that it may need to address in terms of barriers. The system map will also be a useful tool as you design your fuller implementation plan during the beta development phase.

Do

The Do phase of the process takes the clarified user persona and “How might we?” question and asks teams to “work in a different way” by brainstorming, bodystorming and prototyping solutions. Teams will create an expression of their best current thinking, and test that out through user testing and other critical feedback.

Participants will repeat this part of the cycle over and over again until they hav e sufficient feedback to take their design to implementation.

Intro to Prototyping

Prototyping is a way of learning our way forward when the solution to a challenge is not clear, or when we want to challenge our own thinking and re-imagine the status quo.

Learn Fast, Manage Risk

Prototyping is a way of managing the risk of the unknown by taking the smallest, lowest cost, steps towards a solution and testing them rigorously before proceeding. In this way we try to learn as much as possible with minimal investment. The closer we get to a robust solution the more costly it is to make changes – it is cheaper and easier to change a sketch, than to redo a cardboard mock-up of a space. Likewise, it is cheaper and easier to change the cardboard mock-up of a space than it is to re-order furniture, or change the position of a door, for example. So the intent with prototyping is to learn a lot, very fast and very early on in the process. Rather than trying to learn by thinking and talking about the problem extensively, we learn by creating 'lo-fi' versions of the solution (prototypes) with which to test ideas.

Testing varies according to the kinds of problems being solved, but in any social application meeting the needs of users, and integrating user feedback into the learning cycle is critical.

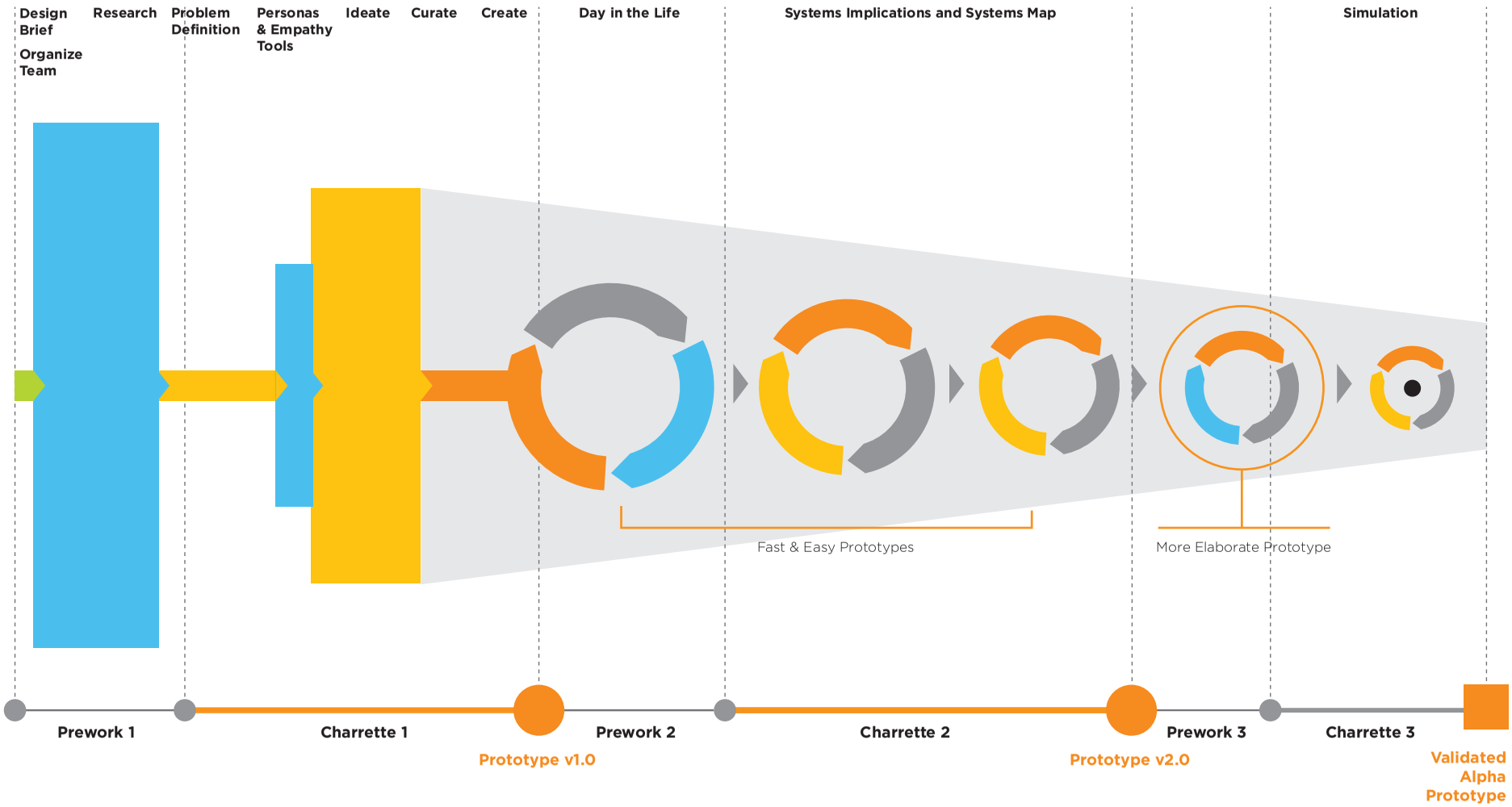
Meet Needs

Key questions to ask early on are: What do we want to be different for the people using our solution? And what do the people we are designing for want to change about their situation? Designers have great ideas to improve situations, and users have a combination of explicit and tacit needs. There is always a dialogue between what the designers see as possible, what the users find desirable, and the ways in which research and prototypes can combine to help users articulate their tacit needs.

Think Differently

We sometimes call this "thinking with our hands", to differentiate it from the way in which we normally understand thinking. Making things together can cut across cultural,functional and language barriers. We learn best by doing. This is not only because of the immediate feedback we get. In addition, we are using our bodies to learn through muscle memory, different learning/adopting styles, calling on visual and kinesthetic pathways, and moving well beyond our intellect and logic (left brain). This is also seen in rapid prototyping, in drawing, in modeling. Making things together is also a high form of collaboration benefiting from public creation, celebrating craft, beauty making, and a deep satisfaction of creating a "something" from nothing.

And it's also a way of thinking with our head, hands and heart together. As our hands create, our brain and body learn, as we take user needs into account we are practicing empathy, and our solutions get closer to meeting real needs.



Team Project Infrastructure

Research

Problem Definition and Design Constraints

Prototyping

Validation

In this rapid process we are aiming to get from initial ideas, through paper prototype to 'live' alpha prototype. In the three charrettes and the assignments between the charrettes we will go through several cycles of making and learning, each time refining ideas until we have a simulation to test at the third charrette.

iLab + ci collective invention

Principles of the Innovation Studio

Progressive Approximation

Prototyping is a good way to work when we do not start with the answer in hand. Because the world is dynamic and needs change over time we also acknowledge that we can never create a fixed, perfect solution. Overall the process mis one of progressive approximation—getting closer and closer to a great solution, in a spirit of continuous improvement and tinkering.

Iterate

Prototyping operates through rapid cycles of creating, testing, learning, refining and restarting that feed forward to move our thinking and creating towards a better solution to the challenge at hand. These cycles are known as iterations. Iterations in prototyping don't usually move us towards a solution in a straight line, but they do move us towards a solution.

Embrace Failure—Fail forward, learn fast

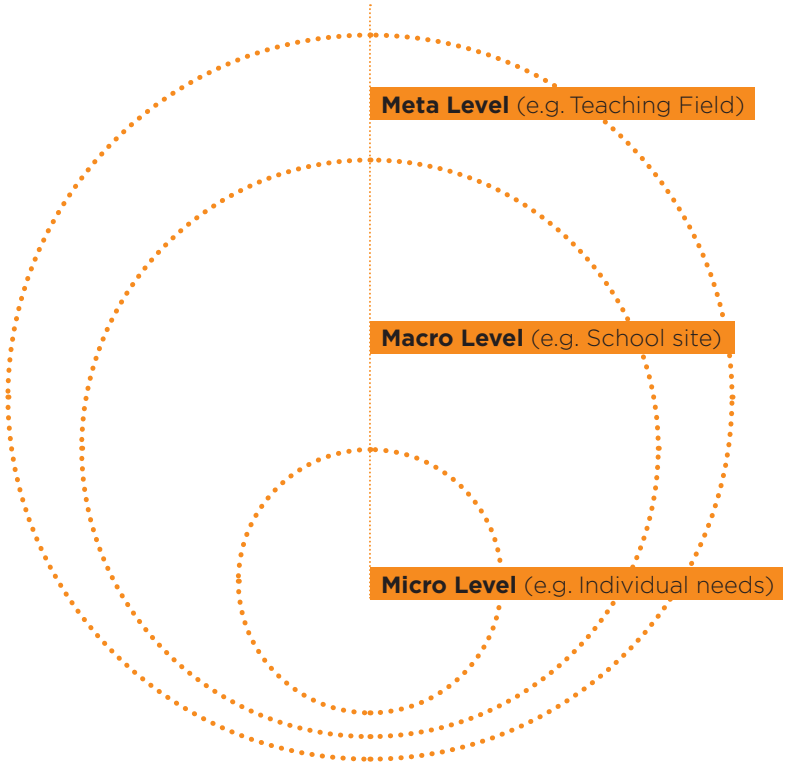
If we are lucky we will learn about the ways in which our developing ideas are not working, so that we can change course before too much time and other resources have been invested. Finding out what's not working is necessary failure, without it we won't learn what will work best. Learning from failure is immediately fed forward into the next version.

Divergence-Convergence

The process of prototyping involves periods when it is best to gather a lot of different inputs and explore different options, and periods when editing and curating those inputs is important. This rhythm is the process of divergence and convergence, and it is a feature of iterative cycles. As the process of progressive approximation gets close to a proposed solution Divergence becomes minimal and Convergence predominates.

Altitudes

When working collaboratively it is important to ensure that we are talking, thinking and working at the same 'altitudes'. At different points in the process we may need to consider the Meta level—thinking about systemic issues and the 100,000 ft view; the Macro level—thinking about sub-systems, or the needs of different groups—the 10,000 ft view; or the Micro level—on the ground detail issues—the 1 ft view. In this project Meta may pertain to the district, or to the broader field of teaching and learning; Macro may pertain to the school site; and Micro to the individual space, or the needs of individuals in that space.



Refine

Critical Feedback & Learning Forward

An essential part of iterating a design is getting outside feedback. Users will always give good feedback, and if they are part of the team this will be ongoing. More formal user testing can also be done as the alpha prototype becomes more robust, and there is something for users to interact with. It is also useful to get feedback from Critical Friends – people who understand and are supportive of the intent of the design work, have some contextual knowledge, and who will also give very candid, direct and constructive feedback.

The team will go through various rounds of feedback—from critical friends, and from users—and will then take this information and use it to refine their design. Each piece of feedback should be given and taken in the spirit of moving the solution forward, and not stopping the process. Each piece of critique is another opportunity to ask a How Might We Question.

Description of idea, with photo or copy of sketch

What 3 words come to mind when you look at this idea?

What do you like about it?

What do you notice?

What do you want to know more about?

What other questions do you have about it?

The Culture of the Charrette

Ideas expressed in words mean different things to different people in different contexts.Expressing ideas in visual images as well as words helps "disambiguate" meaning, captures a "thicker" interpretation of ideas, and builds shared understanding.

Equally important, visual thinking, by stimulating richer neuronal activity, encourages the cross-connection among ideas. This is crucial to innovative thinking.

What I Hear I Forget,
What I See I Remember,
What I Do I know.

This ancient Chinese proverb is borne out by modern neuroscience. We have poor memory retention of what is said to us. Visual imagery, by contrast, sticks in both short and long term memory. In part this is because some 70% of our neural receptors are specialized for visual processing. Finally, the experience of doing something, or even simulating doing something embeds it in our minds, our memories, our muscles. (A pianist can rehearse by playing his fingers along the edge of a table. Athletes today are taught to pre-image their upcoming performance in as vivid detail as possible. Brain scans show that pre-imaging a thing, a place, or an activity excites the same brain centers and produces the same somatic responses as the real thing). This is why cognitive learning is "thin" and has such a short half-life ("let me describe to you how to ride a bicycle") while experiential learning is "thick" and sticky (once you've ridden a bicycle, you always know how).

In our methodology, we emphasize visual imagery and the construction of experiential knowledge. The visualization and experiencing methods that we use are central to collaborative generative thinking.

Visual Ideation and The Charrette

We apply to organizational innovation certain techniques of creative thinking borrowed from the fields of architecture and industrial design One of these is the "Culture of the Charrette." Charrette is a French term used by architects and designers to mean an intensive, round-the-clock collaborative team work session. In French, a Charrette is a horse-drawn cart. The term originated in the eighteenth century when teams of architects worked many days without sleep to prepare design submissions for state-sponsored building projects. On the morning of the judging, they tossed their rolls of drawings down into the cart as it trundled by in the street below, collecting the submissions.

A central characteristic of the Charrette is visual idea generation. All thinking is done in rapid visual iterations, proceeding from the roughest early concepts to successively more refined versions. All working materials, including all reference material, data, and creative stimuli, as well as work products are put on the walls. This gives everybody the same shared view of the content as it emerges and the same shared history trail of the collaborative body of thought as it grows. Everybody feels free to annotate, rearrange, cluster and re-organize the material constantly. The effect is like viewing a visual, neural-network map of the collective mind of the project team. This stimulates

the spontaneous cross-linking of previously unrelated detailed ideas and the pattern-recognition of larger gestalts—the "Aha!" cognitive behavior that is uniquely characteristic of human higher mental functions.

Visualization is not confined to representational drawings. It includes rapid rough sketches, diagrams,, maps, process flow-charts, icons, brainstormed phrases and key words. What is important is to generate as rich a field as possible of data-items and to keep them all visually displayed all the time. Visualization also includes very importantly constructing three-dimensional physical models. These can vary from found objects or crude "blank models" made from bits of paper, plastic or clay, through iterations of rough concept prototypes to high-fidelity prototypes.

Finally, visualization can include enactment; that is: bringing to life the potential user of an idea being developed. This can be done by playing the role or simulating the behavior, or imagining a scenario story of a hypothetical potential user, or by actually engaging a real potential user in the generative process as a test subject or a co-participant.

Within the intensive, immersive, experiential, and schedule-driven context of the Charrette, visual representation stimulates out-of-the-box, boundary-testing thinking. Architects and designers do not think of visual ideation as the documentation of a thought after the thought is already completed – it is rather thought brought into being by the act of visualization. A designer will customarily "draw something to see what I think". Some visual or tactile image—a doodle, a mark, even just randomly handling an object—gives rise to a new thought, which leads to the next image, then to the next thought, and so on, in a succession of image-prototypes and thought-hypotheses chaining ever forward. Because it proceeds iteratively from crude preliminary gropings toward ever higher-fidelity clarity, some designers call this process "successive approximation."

Not only does visualization operate on ideas like a ratchet or amplifier, it also seems to trigger the emergence of ideas from the realms of tacit, unconscious, and abstract thought into accessible, explicit and concrete form—a process called "reification."

The designer's rapidly iterative, parallel-processing, visually-mediated way of working is in sharp contrast to the conventional mode of organizational discourse, which tends to be linear, sequential, text-driven, and verbally mediated. In the Charrette, the style of thought that dominates is generative, exploratory, divergent, and variety-seeking. By contrast, in conventional organizations, the dominant style of thought is convergent and resolution-seeking. Innovation requires continuous iteration between both styles of thinking.

The Charrette Space

A further key feature of Charrette culture is the generative nature of the physical space. A Charrette takes place in a space exclusively dedicated to a specific project for the entire duration of that project. Everything relevant to the project content, structure and continuity is displayed continuously on the walls.

To walk into the Charrette space is to be instantly surrounded by and immersed in the entire, un-compressed history of the project. Members of the project team may have come from geographically distant "home bases", but for the duration of the project, they work together, here, continuously. They need only lift their heads to see every detail of the project in every dimension. Neatness and tidiness do not dominate here. Continuity of argumentation, persistence of information, shared meaning, visibility, creative stimulation, and surprising interrelationships of dissimilar parts count for everything. These are the lifeblood of the kind of generative ideation that leads to innovation.

The Charrette space is dramatically different from conventional organizational workspaces: the individual's personal workstation where he or she stores personal knowledge that remains inaccessible to others—or the conference/meeting room,

where PowerPoint presentations disappear from the projection screen in quick succession and any reference material put on the walls is instantly taken down to clean the room for the next meeting—disappearing into somebody's personal workstation space, or the trash. In most organizations there is no sharing of the original generative process that gives rise to the written report or the Power-Point summary. The formal parlance of organizations is a "thin," cryptic, tidy, verbal summary that loses the "thick," messy work-in-progress, rich with patterning and cross-connecting possibilities. The conventional organization is the antithesis of a learning organization. The conventional organization is more like a person who has amnesia instantly after every creative thought.

The Charrette space is the physical-temporal embodiment of visual thinking. It ensures:

- **For all participants, the same view of all ideas as they emerge in real time.**
- **A document trail of the unfolding conversation**
- **Information persistence (thoughts don't get lost or diluted through summary)**
- **Knowledge display and pattern recognition (because all ideas are on display all the time, synaptic connections take place between ideas in different contexts and at different points in time)**
- **Shared knowledge, shared meaning and shared understanding.**
- **All the raw material necessary for conveying the Charrette output to others.**

Arnold Wasserman
for Collective Invention

Arnold Wasserman is a co-founder of Collective Invention™, an innovation think/do consultancy based in San Francisco.

Developing 360° Attention

When doing fieldwork, or field expeditions, we want to maximize the amount of information we can take in. In everyday life we tend to default to absorbing information that comes through our dominant sensory channels, and that conforms to our assumptions about the world. In order to counteract this tendency whilst in the field we need to open up our other senses, work with others who have different dominant senses, and question our readiest assumptions. These notes were originally prepared for people learning to do ethnography, however, they are relevant to our attempts to explore and learn in any contextually rich environment. They cover four areas which can help us develop 360º attention:

- **Openness and receptivity**—challenging our assumptions to allow a situation to 'speak' to us
- **Multi-modality**—referring to different sensory channels, or the different media types information can be expressed in
- **Deepening Questions**—asking for contextual details, associated feelings, conceptual associations and connections
- **Content/Process Distinction**—noticing how something is said, the timing of it in a conversation, to whom it is said, for example, as well as the informational content

The following Notes will give introductions to each of these elements. The ordering here is not important, and the ultimate aim is to develop each of these capacities to work together.

Openness and Receptivity

Undertaking a Learning Journey, like doing ethnography, requires an openness and receptivity to the situation being studied. Even if we have a specific question in mind to be answered, or a specific focus to explore, in order to appreciate the stuation at hand we need to put that aside at first and let the situation speak to us. The purpose of this is to try to suspend our assumptions about a situation in order to facilitate our receptivity to information. It is not possible to do this completely, which is why we also continually question our judgments and assumptions as we move through the process.

What unanticipated things can we learn here? Ways of keeping things open include holding our agendas lightly - for example, widening our perceptions intentially, and using multi-modality (see below), and by not having fixed lists of questions. If we have to make sure that certain things are covered, we may have a core list of topics or suggested questions, but again we need to hold these very lightly, possibly only introducing them if it looks as though an interviewee really isn't going to cover them. And if this happens a few times we might ask ourselves why the things that we think are important about this situation are not, apparently, as important for those people who live that situation. Whatever happens in an ethnography project, it is all data. Openness in the interview also allows us to discover new things about the situation that we could not have anticipated with our questions.

Multi-Modality

Before you read this section take a moment to try the following exercise:

Sit comfortably in a chair, close your eyes and think back to your last vacation. Allow yourself to remember this experience for a few minutes – it doesn't matter, (for the purposes of this example!), whether it is a pleasant, or an unpleasant memory. After a few minutes spent down memory lane, open your eyes, and notice how the information of this memory came to you. What did you notice first? A visual of the place you went to? A visual, or a sense of the people you went with, or met there? The sounds of a place – music, waves on a beach, etc.?

Some of the informational content of this memory will be shaped by the kind of place you went to, but the ways in which the sensory information comes to you, particularly that which comes first, will indicate your dominant sensory channel for receiving and remembering information).

Multi-modality refers to the different channels by which we can receive, or disseminate information. For example, a message may be relayed by words – written, spoken, sung; or by images; or music; or dance; or sculpture, etc. It may be mediated through a book, or music, or a film.

In doing ethnography we want to keep all the sensory channels in mind for two main reasons. Firstly, we want to develop as full a picture as possible of whatever it is that we are researching. The more sensory awareness we can bring to bear upon this, the fuller that picture will be. Significant aspects of our research subject may also be conveyed through channels that are not the dominant ones of words or visuals. The sound-scape of a place may tell us a lot about that place, for example.

Secondly, different people take in information in different ways. Many people are visual, for example, and will

primarily take information in this way. As a species we have a highly developed visual cortex. Much of dominant industrialized culture is also visual. However, for some people other channels are stronger. They may take information in aurally, through the sense of touch, or be particularly sensitive to emotional undercurrents or the sense of 'energy' in a particular place, or person. The value of appreciating these differences is that on a team, people with different dominant channels, will notice different things during observations and interviews. This will allow you to develop a richer material sense of the research subject.

The people in your research study may also have different dominant channels. This is likely to come out as you ask for stories of their experiences, and as you notice what those channels are you can tailor the wording of your questions accordingly. For example, if someone has a strong aural channel you might deepen a question about their typical day by asking for a soundtrack of that day, and exploring the associations with each song, sound or piece of music that s/he suggests. It can also help to avoid interviewees getting blocked when asked for associations. Someone who focuses a lot on energy may find it hard to give you visual images in association with something, or may find it easier to do via considering the energy of that thing first.

Deepening Questions

The easiest and quickest way to deepen any question is to ask for a story to illustrate whatever it is that your interviewee has just said. Usually it is best not to name this as a story specifically – some people take offense to the word 'story', because, for them, it carries the implication of something that is not true. Instead, you can ask follow-up questions like:

"Can you give me an example of that?"

"How did that make you feel?"

"What is that like for you?"

"Tell me something about that time"

"Could you tell me a little more about that?"

"What's a particularly good/bad memory associated with that?"

"How does/did that feel?"

Sometimes indirect questions are also good for provoking a story:

"Tell me a little about the friends you did that with"

"What time of year did that happen?"

The aim with questions is to get three types of information: basic content information; perceptual and meaning-making information; process information. These types of information are discussed further in the Notes on Content/Process distinction. But briefly, basic content information is the direct response to a question, perceptual and meaning-making information is what this means for the person concerned, how they view the subject under discussion, and process information is the dynamic, feeling tone of the interview at this point.

For example:

"What kinds of movies do you like?"

"Anything that's not junk. Not Hollywood blockbusters." (Basic content information)

"Can you give me an example?"

"'Take My Eyes', it's a Spanish film about domestic violence. It's sad but meaningful." (Still mainly content information, but here the interviewee has also indicated something about what is important to him, we're moving towards personal meaning-making.)

"So what's a junk movie for you?" (We could also have gone in the direction of probing on his sense of what is meaningful.)

"Anything with bad acting, bad script. Anything that feels like a waste of my time, if I feel that I could have been doing something else with my time. And I like things that feel real."

(This gives us a sense of what is important to this person. This echoed a theme that occurred throughout this interview that indicated that this was a person who liked to be active, and to feel that things were moving. Sometimes there is a strong cultural assumption that things like films and TV are about escaping from reality. For some people this is important. But for this person that was emphatically not the case.)

During this part of the interview, the interviewee – who kept a lot of direct eye contact with me throughout the interview – looked into the distance for a moment as he mentioned the film. The few times that he did this during the interview felt like times of particular reflection. This was an impression built-up over the times that it

happened, and related to the things he was talking about. It is not the case that looking into the distance, rather than making eye contact would mean the same for everyone, for some it may be an indication of lying, for others a sense of dissociation, and so on. But in this interview it felt like the kind of reflection in which he was more engaged with the thing he was remembering than with the interview itself. (This is process information, which can give us further information about the interviewee, and about the way in which the interview is going, for example.)

Content/Process Distinction

During interviews, particularly, but also during observations and analyses, it helps to assess each response at the process-level as well as the content-level. The process-level will give you insight into the dynamics of the interview itself, for example. As the interview is also an example of the research subject in action this can give you further insight into your subject. It also gives you insight into your own perceptions and biases, which is critical when doing qualitative research.

To start with the familiar, we will look at two content levels:

The informational content level covers basic information responses to questions, e.g.

"What places do you like to visit?"

"Art galleries."

But unless we are interrogating this further for ourselves we will only have our assumptions of what this means. We need to look, for example, at the perceptual and meaning-making content. The question to ask ourselves here is: "What does this mean for X?" As in the suggestions given in 'Deepening a Question', we might ask, "How do you feel when you're at an art gallery?" "Who do you like to go with, and why?" Or, more broadly, we might ask for the story of the last art show that X went to, or the best. The aim here being to gather information about what this experience means for X. It is important to do this because perceptions drive beliefs, values and behavior more strongly than facts do. It is also important because in qualitative research a lot of information is filtered through the subjectivity of the researcher. In order to serve the subject best it is vital to interrogate our assumptions. Going to an art gallery, for example, might mean something very different for the researcher than it does for the subject X—what it means for the subject is more important.

The perceptual and me'aning-making response, then, may be something like:

"Because art makes me see the world in different ways and I like to be challenged like that." Or "It's a spiritual experience for me." In other words there could be a variety of different reasons, each one begging potentially illuminating further information.

The other level of attention to bring to bear is process awareness. This is a meta-level awareness of the dynamics of the interview, for example. To pursue the example of an interview, process level questions include: "How is this person responding to this particular question—are they angry, excited, sad, defensive, for example?" And, in relation to this, "How does this response make me feel, as an interviewer?" "How am I being pulled to respond to this?" For example, if an interviewee is getting angry about a certain question, you might find yourself getting angry in response, or alternatively getting placatory. Once you've noticed this, you have some options: if you get angry in response you may not get any further information from your subject; being placatory may work, or it may alienate your subject; another option is to calmly state what you've noticed and enquire about the anger, this may bring the interviewee into a calmer state of mind, or may make them more angry. Deciding upon an option will depend upon what kind of rapport you have built with your subject and what you know about them.

Noticing the emotional climate of an interview will help to attune you to those things which the interviewee feels most strongly about, or cares least about. It will also indicate which questions draw the strongest responses. You may want to use this information in future interviews. For example, in interviewing someone who has some direct responsibility for something that others have expressed anger about you may want to say, " some people have felt particularly strongly about ….".

It will also help you to learn more about the interviewee because you are learning about them through the ways in which they are responding to you. The more informal and naturalistic you can make the interview, for example, the more you will be seeing the interviewee 'in vivo'.

For observations, informational content information will be in your descriptions of what you see, etc. Perceptual and meaning-making information will generate questions to ask, either of yourself and your team, or in follow-up interviews if you have the opportunity to do them. Process information will help to distinguish your biases about what is going on, allowing you to ask questions about the ways in which people are using something, or otherwise interacting with it.

For analyses, informational content information will be the baseline of what you look at, and in your team you will trade perceptual and meaning-making information and process information. One of the great values of working in a team, rather than working alone, is that the perceptual and meaning-making information and the process information will provide you with a rich array of possibilities. These latter types of information will become the most significant – and contested – material in your analysis.

In summary: Informational content – the basic level of information you will get about a particular issue.

Perceptual, meaning-making content – what the informational content means for the person involved.

Process level information – how the interviewee is responding to the interview; how the interviewer is responding to the interview. Generally speaking, how the interview 'feels', how it is going, the dynamics and emotional climate.

Endnote:
Overall, the aim of these notes is to help you to open up your awareness and allow you to take in more information. Do not try too hard to remember all of the information above, i.e. do not let your attempts to develop 360º attention get in the way of your receptivity. If you know yourself well enough to know what you usually focus upon, and can prompt yourself to notice other things you will be developing your awareness. And if you are working in a team, make use of each other's different propensities and perceptions to develop a fuller picture of the place and people you are learning about.

Fiona Hovenden
for Collective Invention