I Spy Data Science That Listens

I Spy is a game where a lot of busy, detailed drawings are packed together on one page. Sometimes the game is simply to find one item, like a certain character. Other games give you a list of items to find, which is true for our game. In our case, the list of items are ideas from Indi's method Data Science that Listens.

We cannot reproduce the visual searching fun part of the experience for people using screen readers, but we can provide a way for you to enjoy detailed descriptions of the illustrations along with definitions of the ideas.

Introduction

People's cognition is marvelous. Learning about it doubles your success and provides better value to people. Data Science That Listens is a method that visualizes and tracks patterns of cognition for you to guide improvements over the years.

List of Items

Here are the visual descriptions of each item from that page, along with each definition. There are 38 items in total.

1. Purpose:

   Image: A person in a t-shirt bending over to talk to their mother, who is sitting in a wheel chair. Mother's right leg is bandaged, and she is looking tired. The words in the image say, "Purpose: take care of my parent while they recover."

   Definition: An intent or goal that a person is consciously addressing, deciding, planning, making progress on, putting off, or trying to avoid entirely. It's usually broader than a typical product goal because this is strategic research, whereas tactical research focuses on the solution and the "user" of the solution.

2. Framing a study:

   Image: Three paintings in three different size frames on a wall. The paintings each depict the same thing (a squash) but of different sizes. The words in the image say, "Framing your study."

   Definition: Define or set the scope of the conversations you want to have with people so that the knowledge your team is missing has a chance to emerge. There are broad frames, medium frames, and narrow frames. It's one of several variables that determine how many people to recruit.

3. Qualitative & quantitative data:

   Image: Two horizontal arrows, one above the other. Each arrow is fat and has little icons decorating it inside the borders. The upper arrow is labeled "quantitative," and those icons are numbers, math symbols, and bits of charts. The lower arrow is labeled "qualitative," and those

icons represent ideas like a house, butterfly, sun, an idea, pencil, happy face, heart, etc. Each arrow also has two arrow ends; the left ends are labeled "subjective" and the right ends are labeled "empirical."

Definition: Quant data measures how much, and qual data represents conceptual patterns. Both have an "iffy" version full of assumptions and a solid, reliable version, two ends of the spectrum for both types of data. (For qual, reliable patterns occur at data saturation.)

4. Listening deeply:

Image: Two people communicating with each other. The person on the left has their mouth open, talking, and their hand gesturing. The person on the right is focused on the person on the left. In between them are words saying, "Many forms of listening," with option A representing speech bubbles implying audible talking, and option B representing a chat using a screen, with messages flying back and forth.

Definition: To get outside your own perspective, and resist cognitive bias, listen for another person's core interior cognition. One-on-one. You can listen remote or in person, audible or by text. Also via sign language, drawing, movement, gestures, etc.

5. Germinal question:

Image: Hands holding out what looks like a bulb or hill of soil with leaves poking out the top, and a big question mark above it. The words say, "Germinal question."

Definition: The one question that a listener poses at the beginning of a listening session, "What went through your mind the last (few) time(s) you were <the purpose>?"

6. Topic:

Image: a person sitting behind a table with their mouth open, talking. Thought bubbles are coming out of their mind, where three of the thought bubbles show a hot pot, a stack of leftovers in containers, and a burger. From the last thought bubble a ball with splotches on it is dropping down onto the table top. On the table are other balls like this one, but of different sizes and with different splotches on them. The table shows the word "Topics." Each ball is a topic.

Definition: A subject a person communicates. A person will bring up many topics during a listening session, like putting subjects on the table. The listener will not bring up any new topics. Example: "Our team has good relationships with most of our stakeholders."

7. Concept:

Image: One of the balls with splotches cut in half, revealing several layers inside. The ball is labeled "Topic." Inside the half ball are little tiny beads orbiting at the various layers. These little beads are labeled "Concepts." The ball is meant to be like a jawbreaker candy, with its layers inside.

Definition: One of the discrete ideas or notions that a person brings up about a topic. There will be several concepts inside a topic, at the various layers. Example: "As I was reading about this method, I was also imagining how two of my stakeholders might react."

8. Topic layers, as represented by a jawbreaker candy:

   Image: Half a jawbreaker candy with four layers labeled. The outer shell (with the splotches decorating it) is labeled "Description." The next layer inside is labeled "Expression." Another layer is sketched in. Then at the center the core is labeled "Interior Cognition."

   Definition:

   Description layer (the outer shell) contains concepts: Explanation, scene setting, fact

   Expression layer (next layer in) contains concepts: Opinion, preference, attitude, perception

   Almost cognition layer (third layer) contains concepts: Generalized, implied, future

   Interior cognition (core) contains concepts: Inner thinking, emotional reaction, personal rule

9. Concept types of interior cognition:

   Image: Half a jawbreaker candy with three little jewels in the center core in the shape of a crystal ball, a heard, and a four-pointed compass star. These represent inner thinking, emotional reactions, and personal rules.

   Definition: A way of categorizing the concepts of core cognition. It is these types of concepts that we are interested in.

10. Inner thinking:

    Image: A crystal ball on a short stand, labeled "Inner thinking."

    Definition: A person's active thought process, conscious or subconscious. Sometimes it's that little voice inside your head.

11. Emotional reaction:

    Image: A gem-cut heart with sparkles around it.

    Definition: A spark of emotion, a feeling, mostly as a reaction to a person's context. Example: "feel anxious," "feel excited." It's often confused with an opinion, as in "feel that," "feel like."

12. Personal rule:

    Image: A four-pointed compass star, faceted, with the letter N a the top (for North). There are shine lines coming from all sides of the star.

    Definition: An instruction or rule a person uses for actions or decisions. Each personal rule was created over the course of their lifetime. Can develop from values, superstition, discrimination. (Also called a "guiding principle.")

13. Pull-tab:

    Image: A can of soda decorated with crystal balls, hearts, and compass stars, with a hand opening the pull tab at the top.

Definition: During a listing session, it's a way to notice when there might be more to understand about what someone mentioned, such as phrases, hints, emotional shading, or suspecting your own assumptions.

14. Memory mode:

Image: Two scuba divers under water, with air bubbles around them. The diver on the right is just above the floor of the sea, with fishes and sea plants around them, gesturing to a treasure chest that is closed. This diver is in memory mode, about to recount their inner thinking, emotional reactions, and personal rules from a past event, represented by the treasure chest. The diver to the left is the listener, floating above the first diver paying rapt attention to them.

Definition: It's much easier for people to talk about their past interior cognition, rather than their present cognition. Much of the listening session will be spent in memory mode, where the person is focused on relating their cognition from "back in time."

15. Session mode:

Image: Now the two divers are in a boat up on the top of the water. The sun is shining and the water is splashing a bit. They are talking, but not about the memory. This sea surface and boat represent real-time, as the person and the listener work together to find memories to go back to.

Definition: The listening session will start and end with you both talking about the session itself, where it will go, whether there's anything the person expected to say. In between the person will be in memory mode, and resurface often to check in.

16. Find the root:

Image: A person with a shovel has roots growing out of their feet into the soil. The label is "Find the roots!" It is a metaphor for going back in time to understand the cognition from past experiences that formed into opinions and preferences.

Definition: Help the person communicate how an opinion or preference originally formed, to understand their inner thinking, emotional reactions, and personal rules from back then.

17. Pin to a place & time:

Image: Two stick figures, one holding a giant paper map, unfolded to shoe an island. They are pointing to a place on that island where a clock icon shows. This stick figure has a question mark over their head, and the other stick figure is thinking back to a memory of that place and time.

Definition: Help the person more easily communicate about their interior cognition by asking about a particular event in the past.

18. Stay out of judgment:

Image: An Asian dragon moving to the left, with tendrils from its snout and a mane. Its face is labeled "Present." The dragons body undulates to the right, with four legs present, moving. Its tail is uplifted. The body is labeled "Past experiences."

Definition: The person's interior cognition was partially shaped by the total body of their past experience. The dragon's head is the moment of cognition, and the body is the past experience. This reminder helps you see interior cognition as utterly valid from the person's point of view.

19. Comb transcripts for concepts:

Image: A stack of pages from a transcript on the left with many concepts flowing out of it into a set of rows and columns. The concepts are represented by tiny crystal balls, hearts, and compass stars. There is a magnifying glass above these, to signify the idea of looking closely through the transcript for these concepts.

Definition: Search each transcript for all the inner thinking, emotional reactions, and personal rules. Gather repeats into single concepts, and untangle clumped ones, so that you can write a summary for each concept.

20. Summary:

Image: A triangle with three levels delineated inside it. The top level is labeled "Verb." The middle level, slightly wider than the top, contains a key icon to represent the key point. The foundation level, widest of all at the bottom of the triangle, is filled with icons representing ideas like a fish, a flower, a car, etc. This widest level represents the supporting details of a summary.

Definition: For each concept write a summary using their words. Use this formula, to make it easier to see patterns in the second part of data synthesis: verb + key point + supporting details. The key point is what the person is verb-ing. Example summary: Decide + to ask the doctor if codeine is okay + because uncle says she had a reaction as a kid.

21. Demographic assumptions:

Image: Three people standing next to each other. The label beneath them reads "Demographic assumptions." The leftmost person is female with high heels, a form-fitting dress, glamorous glasses, and long hair. She is carrying a purse and there are gleams around her. The middle person is wide, has big round glasses and short hair, and is reading a book. The person on the right is very young, has their hair divided into pigtails, wears a dress with scallops at the bottom hem, and is holding a doll.

Definition: A person's demographics don't cause their inner thinking, emotional reactions, or personal rules (except in experiences of discrimination). Saying "women like expensive purses" or "nerdy people are smarter than people who are athletic" or "girls love dolls" causes your team to make broad assumptions and create inappropriate or harmful solutions.

22. Edge cases:

Image: There is a bell curve, low at the left and the right, and high in the middle. The two low parts are labeled "Edge cases." The high part of the curve in the middle has a box around it and is labeled "The process" with the word "Typical" under the highest part of the curve.

Definition: Don't use this phrase to describe groups of people. Edge cases only apply to a process. Edge cases are other ways to do the process when the context is slightly different, like "it's below freezing" or "several people are out sick today."

23. Average user:

Image: Three different people's legs, from the calf down to the foot, each wearing a sock. The sock on the left is too big for the leg. It falls down to the ankle in a wrinkled bunch and extends out at the end much farther than the actual toe. The middle sock is too small for the big let, squeezing it down and causing pain at the calf, ankle, and toe. The pain shows as lightning bolt icons. The sock on the right fits this person just right. A starburst sticker placed over the first two socks reads, "One size doesn't fit all!"

Definition: A myth. You have a variety of people in your audience. One solution only fits half (or less) of your audience.

24. Thinking styles:

Image: Three heads with brains shown as curly scribbles inside the skull. A different part of each curly scribble is shown in a different color, to indicate that these three people have slightly different approaches to a purpose than each other. The label reads "Thinking styles."

Definition: Groups of people whose cognition is similar as framed by the person's purpose. Not made up! Thinking styles emerge from the listening sessions. How? Most cognition is common across participants, but a few concepts define unique cognitive approaches toward the purpose.

25. Characters instead of personas:

Image: This image has three parts, starting with a comparison of two items on the right. The two items are a TV showing a cast of characters from an imaginary TV show called "The Mental Model Theory." The characters are posing and waving. One character stands off to the side with the symbol of a comic book hero on their t-shirt. The TV is next to a box that represents a persona, with a headshot, text paragraphs, lists inside boxes, and a few images representing gaming, music, and roller skating. The heading beneath these two says, "Characters instead of personas." The third part of the drawing is to the far left, showing thinking styles that each character represents in the TV show. The thinking styles are described in paragraph form.

Definition: To tell a good story you need characters and a plot. Make up a cast of characters to use over and over, like episodes on TV, featuring one character by themselves, or a few of them interacting. Episodes let teams explore something from the mental model skyline that the organization wants to support. Across episodes, characters will represent different thinking styles, like wearing different hats. It's fun to show characters wearing a thinking style hat that is at odds with common biases about their demographics.

26. Focus of mental attention:

Image: Three stick figures standing next to each other, each with a thought bubble. These represent three people thinking about which medicine is going to work, in three completely different contexts. For example, one could be thinking about reducing their mom's pain without using a pill she had an allergic reaction to as a girl. Someone else could be working with their doctor to see which type of anti-depressant best works for them. Surrounding each thought bubble is a larger thought bubble, which is their next-higher-level cognitive context. In this case it's a context of "Figure out which pill works" and it's the same for all three people.

Definition: This is the affinity technique to group summaries by each person's next-level-out focus of mental attention. Groups emerge from people's mental contexts. It is different from affinity techniques that group by keyword, by concepts used at your org, by timeline, etc.

27. Emergent data synthesis:

   Image: An amoeba, shown in time lapse over a period of time. At first the amoeba is shaped kind of like a pentagon, and then the next snapshot of it shows that it has stretched out sections of itself to the upper right and the lower left. The last snapshot in time shows that the amoeba has grown two sprouts off the upper right section that had stretched out. The amoeba grows, shifts, and changes over time similarly to the focuses of mental attention that make up the groups of our data. The label is "Emergent data synthesis."

   Definition: To resist cognitive bias, the affinity groups come from people's cognition. Compare each summary to every other summary to see if the focus of mental attention is similar; if so, group these summaries together. The resulting groups shift and change as each summary gets added to the whole, like an amoeba. Eventually reliable patterns emerge.

28. Mental model skyline:

   Image: A set of eight towers of varying heights, arranged in a row next to each other. It resembles a city skyline. The towers represent groups of summaries, each representing a focus of mental attention. There are tiny icons of crystal balls, hearts, and compass stars decorating the background and a label reading "Mental Model Skyline." A decorative sliver of moon rises in the distance behind the skyline.

   Definition: A visual representation of the patterns of focus-of-mental attention from the data. Because these patterns come from interior cognition, this visualization lasts for decades. You can layer other data on this visual skyline over the years.

29. Capabilities:

   Image: Sticky notes aligned beneath some of the towers in the skyline above. Each sticky note has lines of text on it representing a part of the solution your org has in place or is planning in support of the focus of mental attention of the tower it appears beneath. Some stickies have question marks on them to show potential ideas. Not all towers have capabilities beneath them because either they are towers the org didn't think of, or because they are towers the org does not intend to support, which is a valid condition.

   Definition: Align your solution features beneath the towers they are meant to support. Often gaps appear because the solution features were not designed for a person's focus of mental attention, but instead because it sounded interesting to leadership.

30. Tower:

   Image: One tower showing a label and three summaries within it. The label for the tower is the focus of mental attention "Figure out which pills work." The summaries that came together to create this tower are "Decide to ask the doctor if codeine is okay because Mom has a reaction as

a kid," "Feel relieved the doctor suggests a pill that is safe for Mom," and "Realize that Dad's tummy is upset because of the pill."

Definition: A group of concept summaries in visual format. A tower represents a focus of mental attention common across several people that emerged as we compared summaries to other summaries. For example, these are different towers: "Keep the swelling down," "Learn how to move around," "Figure out which pills work," "Deal with getting the medicine," and "Make sure I don't get addicted."

31. Block:

Image: A set of four towers clustered into a larger group, shown with two vertical borders between this cluster and the clusters to the left or right of this one. The label of this cluster of towers is "Reduce their pain." The tallest tower in the cluster is shown as double-wide since it has six summaries in it, and would be twice as tall as the next tower, which has three summaries. To keep the vertical height from getting too tall, we make double-wide towers every now and then.

Definition: A "city block" of towers having the same next-level-higher focus of mental attention. Just as summaries group themselves into towers, towers group themselves into city blocks. For example, "Reduce the pain," which contains the towers above. (Also called a "mental space.")

32. Harms scale:

Image: a long, thick arrow going from the left to the right with four signs hanging off it below. At the arrow to the right is an emoji for a person screaming in horror and pain. The signs read, from left to right: "Mild," "Serious," "Lasting" with pain lightning bolts on it, and "Systemic" with an explosion and a caution sign on it. Above the arrow is the label "The Harm Scale."

Definition: Words to describe how we harm some thinking styles beyond frustration and confusion. There's serious harm such as interruption and emotional triggering. There's lasting harm such as lost productivity or relationships. There's systemic harm that gets structured into our laws & policies, at a public level and also within an org. See Resources/#images on indiyoung.com to download the full descriptions as a diagram.

33. Measure value to people:

Image: A section of a mental model skyline with five towers and some capability stickies beneath the towers. Evaluative research has been done for each tower, making sure each of two thinking styles are recruited for each study. The results show as two points beneath each tower, one for each thinking style. These points are hooked together to make a sparkline for each thinking style. The points show whether the part of the solution meant to support each tower helps or harms each thinking style.

Definition: Define your evaluative studies by a small subset of towers and thinking styles, then map the results back to the skyline beneath the towers as points. These points form sparklines that show whether the thinking style is being helped or harmed. Track and change these points over time with successive iterations of evaluative studies, to show how the team is improving value to people.

34. Recognize who is missing:

    Image: A big round pie chart is made into three-dimensions by giving it a height. Six stick figures stand atop the pie chart, one of which is making a heart symbol with the fingers of their hands. But there are two cracks in the pie chart, with six stick figures stuck in them, trying to figure out how to get on top of the pie chart. One of the stick figures has a question mark over it's head, and another is trying to pull itself up the cliff of the crack edge to the top of the pie chart.

    Definition: Use the gaps and sparklines in the mental model skyline to decide where to focus your efforts to improve support for certain thinking styles.

35. Innovate for people:

    Image: A hot air balloon with a flag flying on top holds a basket of employees, one of which has a hat on to indicate they are a manager or leader. One employee holds an unfolded paper map. Another employee is looking through a telescope at the city landscape of towers of summaries below, each representing a focus of mental attention that people have as they address their purpose. The org has its name printed on the side of the balloon. The words in the image say, "Innovate for people."

    Definition: Use mental model skyline to choose where to focus and to catalyze ideas for innovation.

36. Teach AI to recognize thinking styles:

    Image: At the left is the head of a robot in profile, with a CPU chip showing as its brain and an antenna off the top of its head. Three speech bubbles show at the right, which are the robot having a different kind of conversation with each of three thinking styles. Each conversation supports one thinking style's approach to the purpose.

    Definition: Teach your AI the thinking styles derived using this strategic research method, and then it will be able to recognize who is after what kind of experience, and guide them to a pre-designed solution.

37. See work fitting together:

    Image: Three people are talking together, standing near each other. One is pointing to a mental model skyline on the wall behind them. Another is holding up a paper with some new ideas documented on it. The third person is thinking of other ways that the ideas connect. The label is "See work fitting together." This drawing comes from a real photo with a systems architect, the content lead, and the UX lead all discussing new ideas for their customers that came up because of the visual representation of the mental model skyline with capabilities aligned and the help/harm evaluative data points below the towers.

    Definition: Across teams, a mental model skyline can hold one cohesive understanding of how users might be supported. It works not only for user experience, layout, and product management, but also for systems architects, content writers, marketing, ops, ethics teams, and strategists.

38. Extend your total addressable market:

Image: Five towers of different sizes cluster in a way that is kind of similar to the Olympic podium of different heights for bronze, silver, and gold awards to athletes. In this drawing there are five people climbing up on the five boxes, plus a crowd of more people behind them, ready to follow. The person on top of one tower holds a heart over their head. This image is meant to represent that your org can provide better support to people, either via innovation or via versions of solutions for thinking styles that were missed in early versions of solutions.

Definition: By understanding the variety of cognition, your org can finally see and address more people.