

Searching for Tasks

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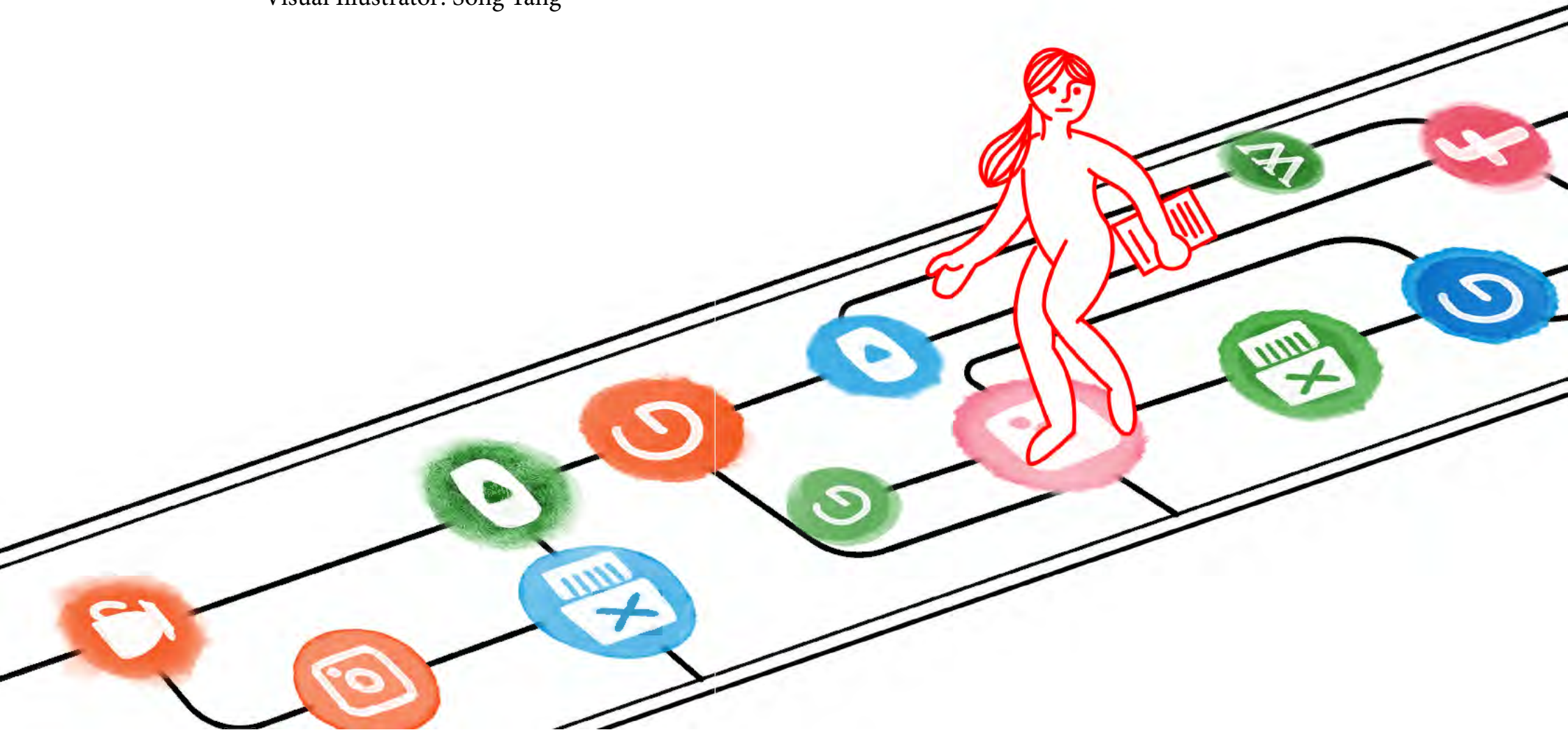
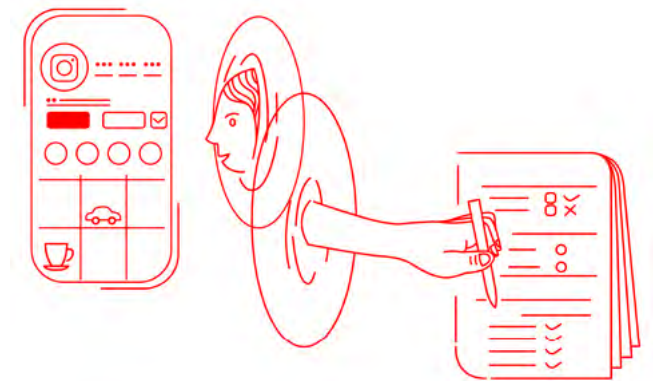


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Executive Summary

Some of the most important digital skills required by the current workforce are being overlooked by contemporary research and policy agendas. These are the heuristic skills that people devise as part of their everyday working lives to navigate the complex digital ecology of online tools for digitally mediated work. As more jobs move online, a better understanding of how people develop and use these coping skills is essential. The starting point for *Searching for Tasks* as outlined in the following report is that skills are not simply fully formed procedures that exist “out there” for people to acquire from experts but are in fact developed through their enactment in situ. Rather than approach digital skills as competencies tailored to specific knowledge domains, our focus is on skill as ‘task-orientation’: how workers develop embodied skills to cope with the tasks at hand in everyday situations. Our perspective has important implications for how we identify and understand resilience in the face of the new social and technological challenges facing workers and the delivery of digital skills education.

In the following report we detail how we have adapted Tim Ingold’s anthropological conception of task-orientation to investigate phases of digital skill followed by an outline of a pilot research project conducted in February 2020 with eleven research participants to develop individual “task profiles”. The key finding is a processual account of digital skills shows how participants had developed a set of “mediatized skills” that enabled them to weave together various human and technological productive forces in ways that included elements of coping with technology and using application software as tools to achieve tasks.

Phases of Skill

Skills are not “out there” to be learned but develop through their enactment in situ. Rather than defining skills using a tool- or media-driven approach, we understand skills as situated, embodied processes known as ‘task-orientation’. Coined by Tim Ingold (2011, p. 195) this term refers to “any practical operation, carried out by a skilled agent in an environment as part of his or her normal business of life.” Part of this approach entails taking a holistic, narrative approach to investigating everyday life (Ingold, 2000; 2006; 2011) which some scholars have applied to digital media use (Moores, 2017; Sumartojo et al. 2016; Pink, 2015; Pink & Leder Mackley, 2013; Pink, 2011). We believe task-orientation offers a flexible way to define tasks performed online and offline encompassing three interrelated themes: 1) the processional quality of tool use; 2) the synergy of practitioner, tool, and material; and, 3) the coupling of perception and action.

Our focus for this project is an investigation into how people perform unfamiliar tasks with digital media using the four processional phases. Unfamiliar tasks are an inherent part of our digitally-mediated everyday life to the extent that we have learned to ‘cope’ (see Sigaut 1994; see Ingold, 2000, p. 332; see also Nicolosi & Falsaperla, 2015, p. 71) with them — making them, in turn, one of our most ubiquitous and essential digital skills. The process occurs through a range of phases: getting ready, setting out, carrying on, and finishing off (Ingold, 2006, p. 67).

Getting ready

The starting point of any search for our participants is getting ready, which includes choosing an environment, getting materials, and opening applications and browsers. Kendall opens her laptop at a campus coffee shop, opens her browser, and grabs a notebook and pen out of her backpack.



Carrying on

Carrying on is the rhythm that develops when people work “with instruments and materials... rather than against them” (Ingold, 2011, p. 55). Abra sits with her smartphone swiping in and out, rhythmically going between websites and her notes app for nearly half of her work session.

Setting out

Setting out begins when “rehearsal ends and performance begins” (Ingold, 2011, p. 54) - when a person begins working through a task but has not yet hit a rhythm. For all of our participants, this searching started by making a Google query.



Finishing off

Not all participants go through the finishing off stage. Some people abruptly leave the search process while they are in setting out or carrying on.

Research Framework

The fieldwork for our pilot research study, *Searching for Tasks*, took place in February 2020 in Vancouver, Canada and included an in-person information session, a self-directed search task, and a follow-up interview using the walk-through method (Light et al., 2018). We recruited eleven female volunteer participants between the ages of 18 and 59 to join the study. Participants came from a wide range of cultural and socio-economic backgrounds.

We asked them to choose from one of three unfamiliar tasks and to complete their chosen task with the help of a self-directed online search. The three potential tasks related to common workplace skills, such as strategic communication (a social media audit), visual communication (modifying an image in Adobe Photoshop), and data analysis (creating a Pivot or Macro Table in Microsoft Excel).

Participants were free to use whatever digital media was available to them to complete their chosen task with the caveat that they use marketing software similar to screencasting, called Lookback.io, which we provided to each participant. Screencasting is a novel method to analyze search and the software is most commonly used as a teaching tool (Marinov et. al., 2016; Soho et al., 2016; Seror, 2012; Carr et al., 2009; Seror, 2012) or as a reference tool (Carr et al., 2009). Screencast software captures “the digital output of a computer screen” while simultaneously recording the audio narration (Marinov et. al, 2016) often in a visible way for the user. In ethnography, the researcher is apparent, but Lookback sits in the background, allowing us to discreetly capture the computer screen, audio, and web camera of the desktop computers, laptops, tablets, and mobile phones of the users. Lookback allowed us to be with the participant, in the background of the device, as invisible researchers, thus responding to a common criticism in video ethnography about the inability to record “people or culture” in an undisturbed environment (Pink, 2007). It is clear from their gestures that at certain points in the completion of their tasks participants forgot we were there.

Despite its advantages for research, participants also encountered some technical difficulties with Lookback. The video collected from screens or webcams were occasionally pixelated or completely dark. These issues made it difficult to describe certain moments within the searches. In most cases (but not all), these issues occurred when participants watched YouTube videos. This problem presented only a minimal impediment to the research process because we could, in most cases, still follow the participant’s process (it also served as a reminder of inevitable technical difficulties that can plague any digitally mediated task).

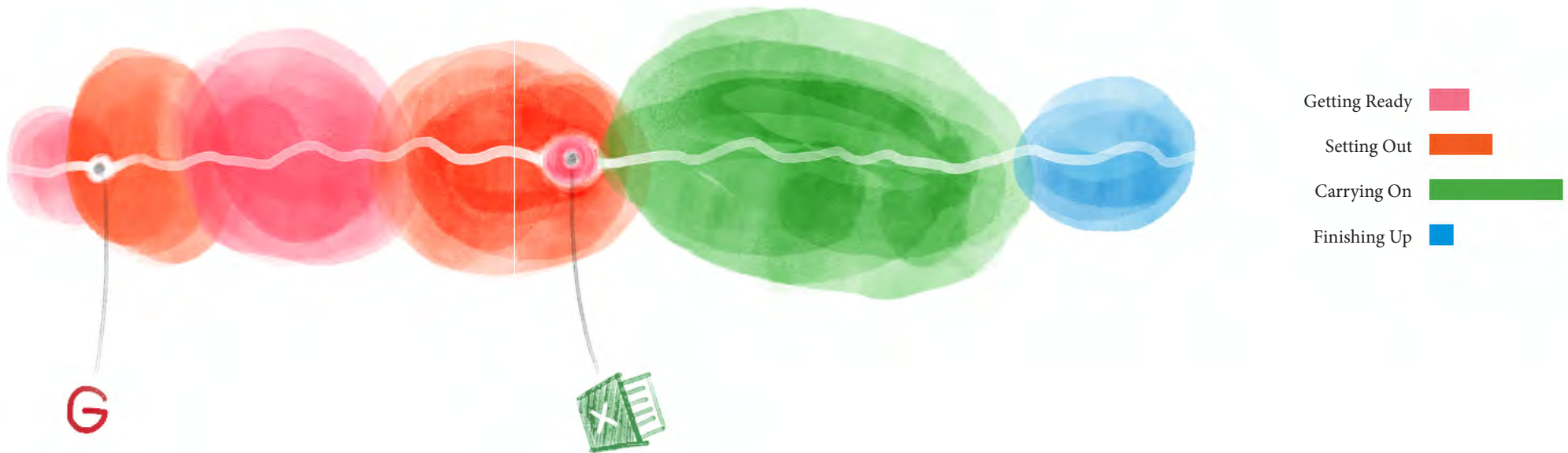
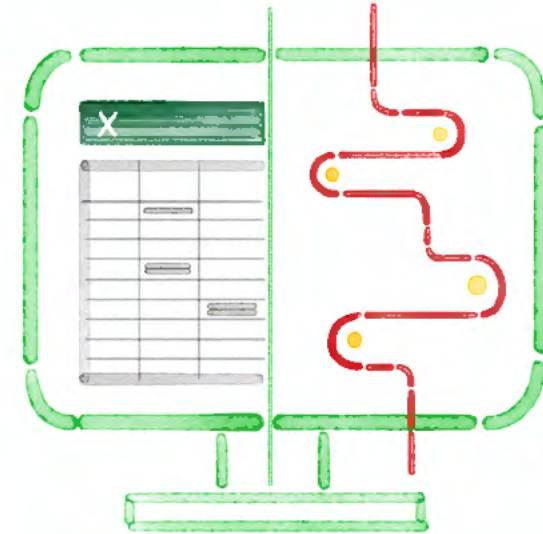
Narrative represents the key means of describing task-orientation because the relations between humans, their techniques and tools develop processually (Ingold, 2011; Van Ittersum, 2014; Lave et al., 1990; Patchett, 2016; etc.). Our analysis of the research material collected therefore focused on creating detailed narrative descriptions for each task. The first round of description entailed a detailed, step-by-step description of the screencast videos in the hopes of identifying the various phases of skill as described in the previous section. Despite (or perhaps because of) this close analysis, we found it difficult to identify the various phases of skill. Taking pen to paper, we initiated a second round of analysis using a colour-coding system to identify moments that corresponded with specific phases and any key pathways involved in these phases. We used this analysis to create a one-page profile of each participant, on which a visualization specialist developed a graph to show the proportion of time spent in each phase and a footprint showing the order of search phases and pathways.

Abra - Pivot Tables and Macros (Laptop)

Abra is in her 20s with a bachelor's degree. She has long black hair and wears a black crew-neck sweater and Apple smart watch. Abra is the only participant that did two tasks: a Pivot Table in Excel using her laptop and a social media audit using her mobile phone. She sits at a desk in her quiet bedroom. The walls are robin's egg blue, and there is an ornate wood bed with two oversized stuffed owls.

Sitting with her left elbow on her desk, she opens a search browser, scrolls through existing bookmarks, and starts Excel. Abra's extended carrying on phase occurs when she visits two Excel tutorial websites (excel-easy.com and contextures.com), which contain downloadable data sets and videos. "I enjoy reading so I can skim through and reach info quickly... if I need a more in-depth explanation, I go on YouTube."

Abra uses a split screen with a web tutorial on one side and Excel on the other, dragging information between rows, values, and filters. Finishing off includes a brief review of participant instructions. She appears stuck or as if she wants to stop. Abra selected a Pivot Table to build off of skills she learned in a statistics course, but "Excel just did not work," which "really stressed [her] out."



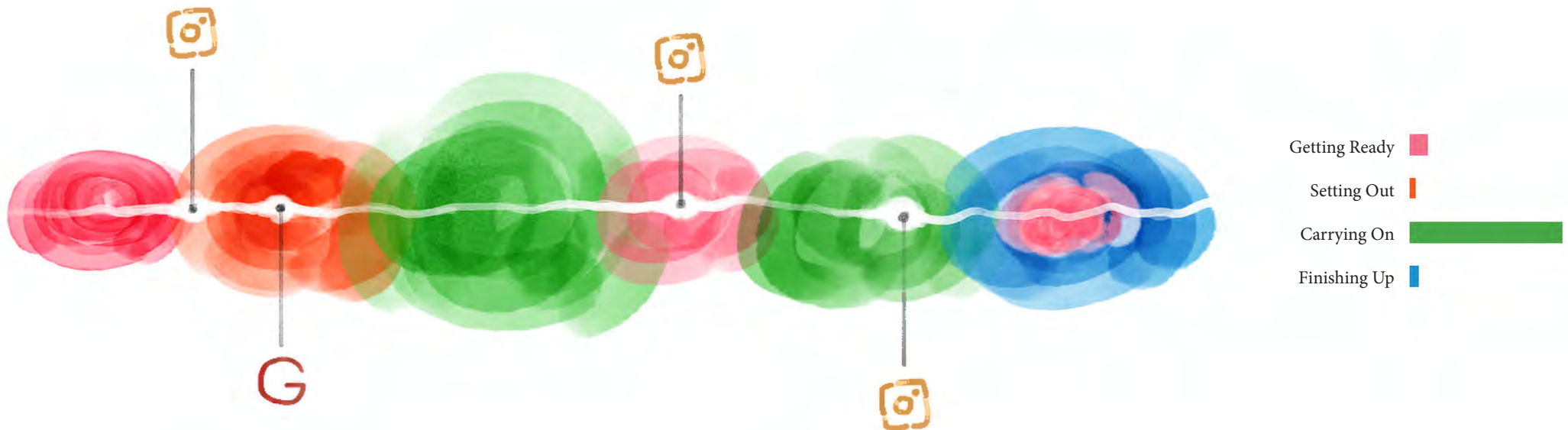
Abra - Social Media Audit (Mobile)

Abra pivoted to a social media audit after becoming frustrated with Excel. She worked as a social media intern during her university co-op but says the skill isn't relevant to her current job search. Abra sits in her room tapping on her smartphone. She says she keeps her phone cleaner than her computer, which she admits often has 30 tabs open at once.

Abra says she starts every search on Google - her "primary search engine" - but, today, she loads the Instagram app and clicks on a sponsored Evo ad before searching "Evo car share" on Google.



Abra's search is unique - she spends over half of her search in carrying on. She swipes in and out of apps and websites, tapping on her phone as a social media audit takes shape in her notes app. Abra's audit of the car share company includes information on the brand, competitors, consumers, and recommendations for improvements, like linking social posts to saleable merchandise and using brand ambassadors. Abra says she uses her notes app for school and work, too, and that it automatically backs up on the cloud. Abra finishes her session by reading the instructions, reviewing her notes app from top to bottom, and returning for one final look at the instructions.

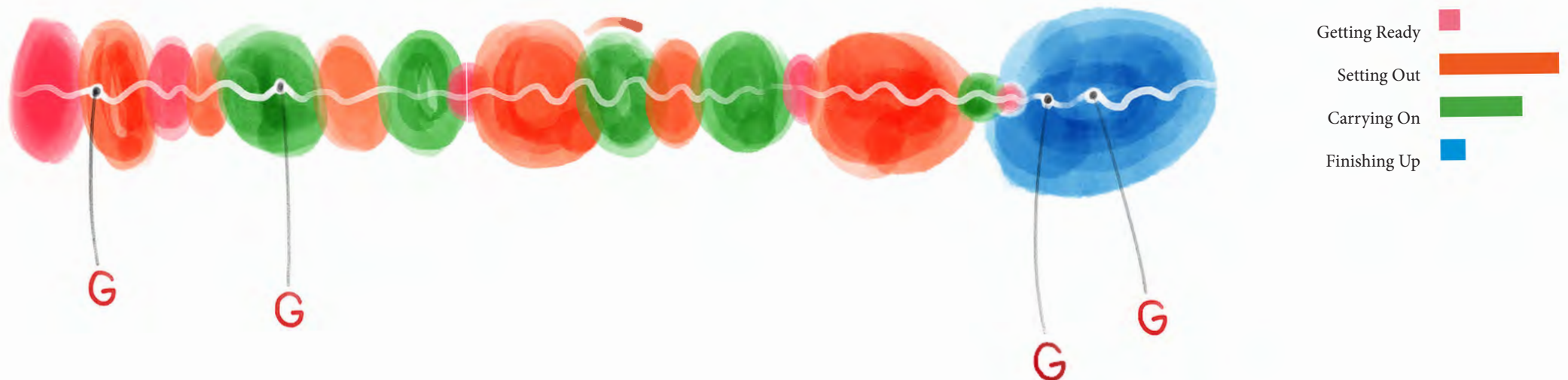
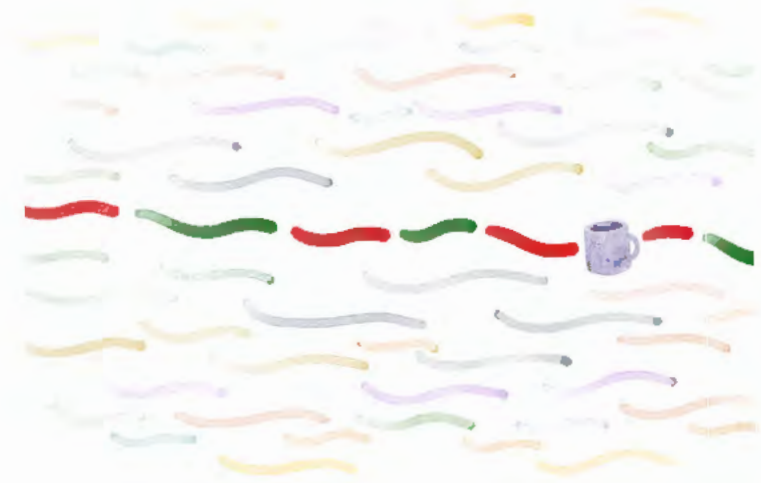


Allison - Social Media Audit

Allison is a female graduate student in her 20s. She has blue eyes and reddish-brown hair, and she wears a loose, olive-green jacket. She teaches as a sessional instructor at a university, while also working in the food service industry. She has considerable work experience for her age – more than 11 years.

Allison sits at a booth in the central public atrium of her university's downtown campus, with promotional banners draped across the walls behind her. She is surrounded by ambient noises, the voices of other people working in the atrium, and an occasional low buzzy noise that she hums to herself.

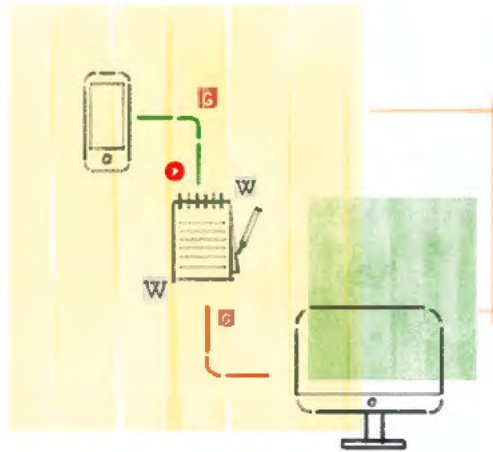
With her elbow on a table, and a mug within reach, Allison stares intently at her laptop. She pulls up the participant instructions, launches a search browser, and types in a keyword search on Google: “an online reputation audit and social media.” She reads the steps in a social media audit (searchenginejournal.com), which prompts her to open a new document in Google Drive. Allison is calm and focused for most of her session, only occasionally pausing to take a sip from her mug. She moves between setting out and carrying on, and similarly, between websites and her Google Docs page, to develop a literature review on social media audits. Allison finishes off by reviewing instructions, her history tab, and her Google Docs page.



Himari - Pivot Tables and Macros

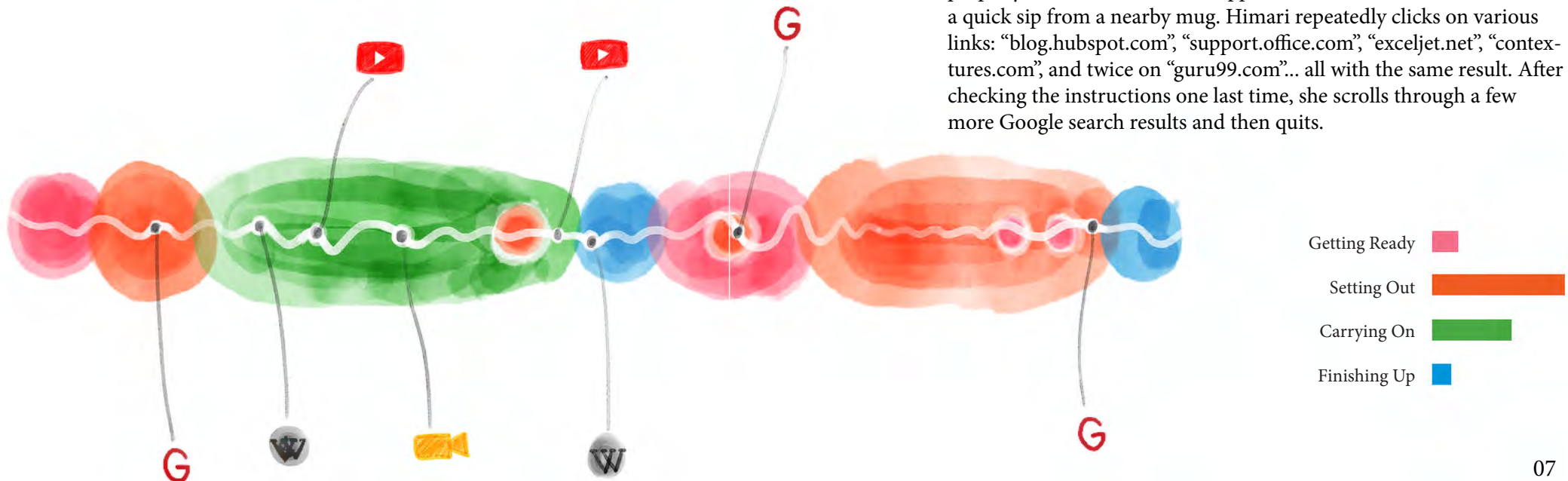
Himari is a female in her 50s with a master's degree and more than 11 years of professional work experience. She is currently employed in business consulting and advising. She wears a white fleece zip-up jacket with the sleeves rolled up and a dusty pink turtleneck. Her black hair is pulled back into a bun.

Himari sits in a solarium room whose walls are painted light yellow; the room doubles as an office space in her apartment. Her desk is in front of large sliding glass doors with green blinds half-drawn near a tall L-shaped silver lamp with a cream shade. Himari uses a combination of her mobile device, a desktop computer, and a notebook to complete her chosen task. She appears in deep concentration throughout the session, occasionally absentmindedly humming to herself.



After reading the instructions online, she begins taking written notes in her notebook. She starts with a Google search on her mobile device for “Excel Pivot Table” which first takes her to the Wikipedia entry to “Pivot Table” then to a video tutorial on Microsoft Office’s official website. All the while, Himari jots down a few notes in her notebook. After viewing the video, she shifts to working with Excel on her desktop to test what was described in the video.

Soon, Himari sets out on another search with her mobile device and finds a website containing more information about Pivot Tables including an embedded YouTube video. After viewing the video, taking a few more notes in her notebook, and checking her work on her desktop computer, she returns to the original instructions for the task stored on her personal device. It is here that Himari encounters a technical problem with her mobile device. From this point forward, none of the videos she tries to upload from her Google search seem to load properly. A look of frustration appears on Himari’s face as she takes a quick sip from a nearby mug. Himari repeatedly clicks on various links: “blog.hubspot.com”, “support.office.com”, “exceljet.net”, “contextures.com”, and twice on “guru99.com”... all with the same result. After checking the instructions one last time, she scrolls through a few more Google search results and then quits.

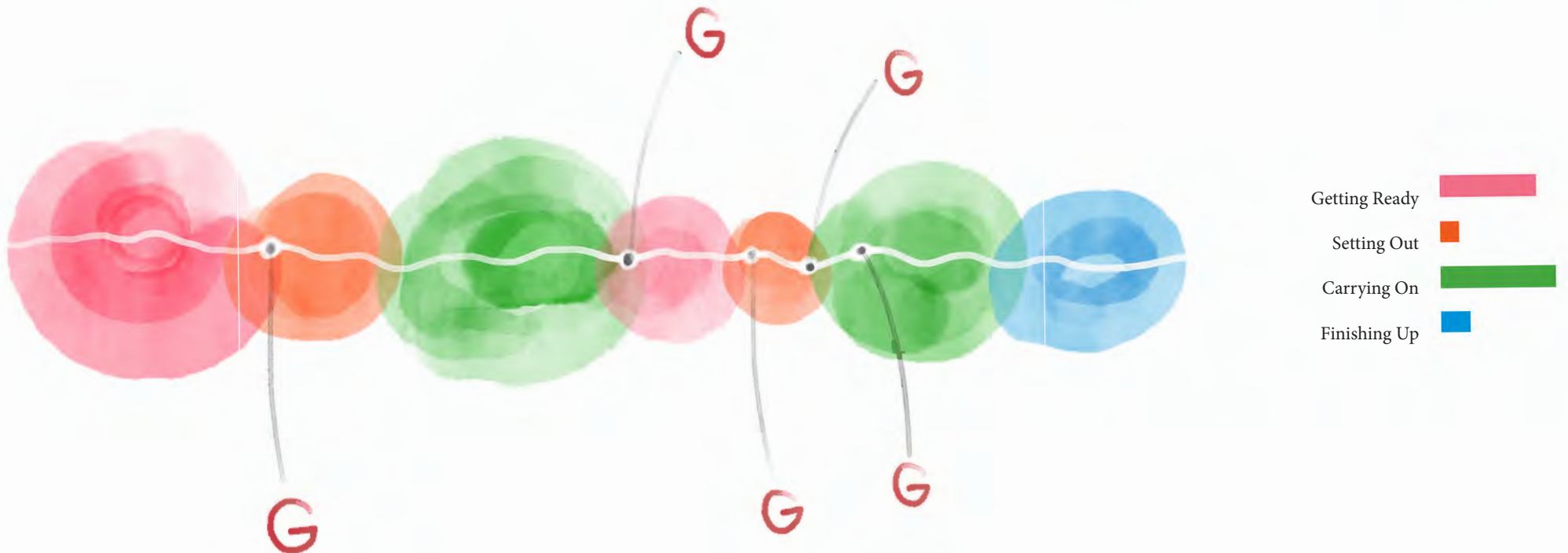


Kendall - Social Media Audit

Kendall is an undergraduate student in her 20s with long blonde hair and big brown eyes. She sits in a campus coffee shop where people talk and drink as machines beep and people bustle in and out of the busy shop door behind her seat.

Kendall flips open her laptop, sets up Spotify, plugs in earbuds, and takes a notebook and pen from her bag. Tapping on her keyboard she types “online reputation management,” but adjusts her query to “online reputation audit” before pressing “search.” She clicks on searchenginejournal.com to learn about conducting a brand reputation audit and develops a repeated pattern of reading and penning an audit in her notebook.

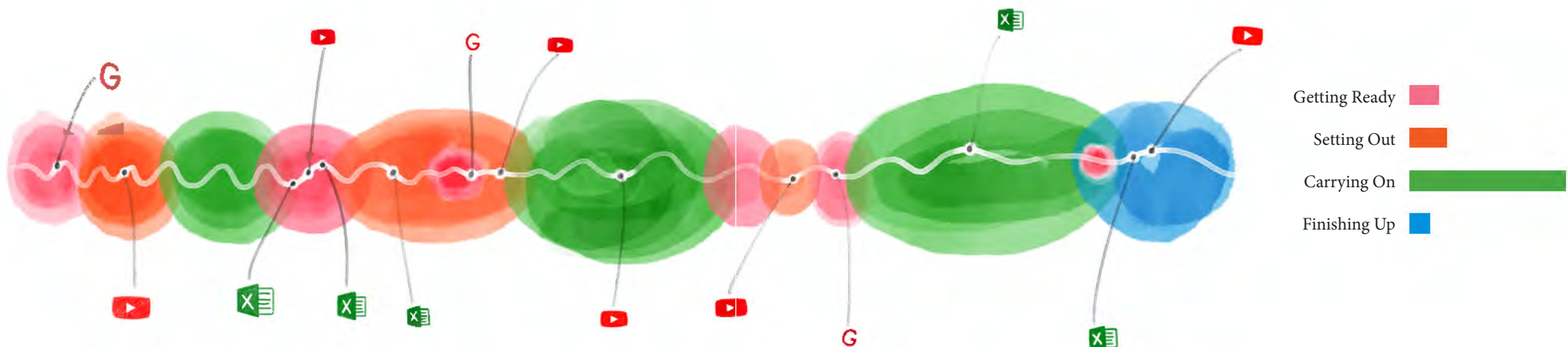
A young man interrupts her workflow with an extended, unsolicited stare from behind. Kendall turns around at the same time the man walks off - it isn't clear if she notices him. She plays with her watch, stretches, and continues her work. On Google, she searches “yoga companies” and “yoga brands” before narrowing in on “Alo Yoga” for her social media audit. She scrolls, reads, writes, and repeats. Kendall finishes up by looking at Alo Yoga’s website, stretching, checking Spotify, and signing off.



Maria - Pivot Tables and Macros

Maria, a young student in her 20s, has brown eyes and straight medium-brown hair that covers her in-ear headphones connected to her laptop. She sits in a minimalist bedroom with a tall wood dresser, a bed, and an L-shaped desk with a few folders stacked to one side. Maria is an undergrad student majoring in science - “science degrees sometimes require data tables,” which is why she thought a Pivot Table “might be helpful.”

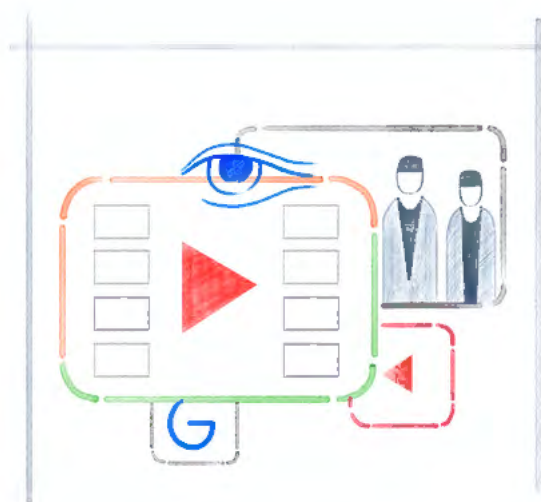
Maria gets ready by launching Lookback and opening Google. Maria says her searches always start on Google; but, as a visual learner, she uses YouTube to understand concepts. She sets out with a YouTube search: “what is a pivot table?” After watching a YouTube video on Pivot Tables, Maria opens Excel, and begins moving between Excel web tutorials and the application. She watches a video or reads step-by-step instructions before copying the action in Excel. Maria says she follows a similar pattern for her schoolwork. “I don’t really use my phone because it’s too small.” She does occasionally use her iPad instead of her laptop – “it’s... the same process... just a different device.” Maria finishes up by conducting a review of her search process and checking her work one last time.



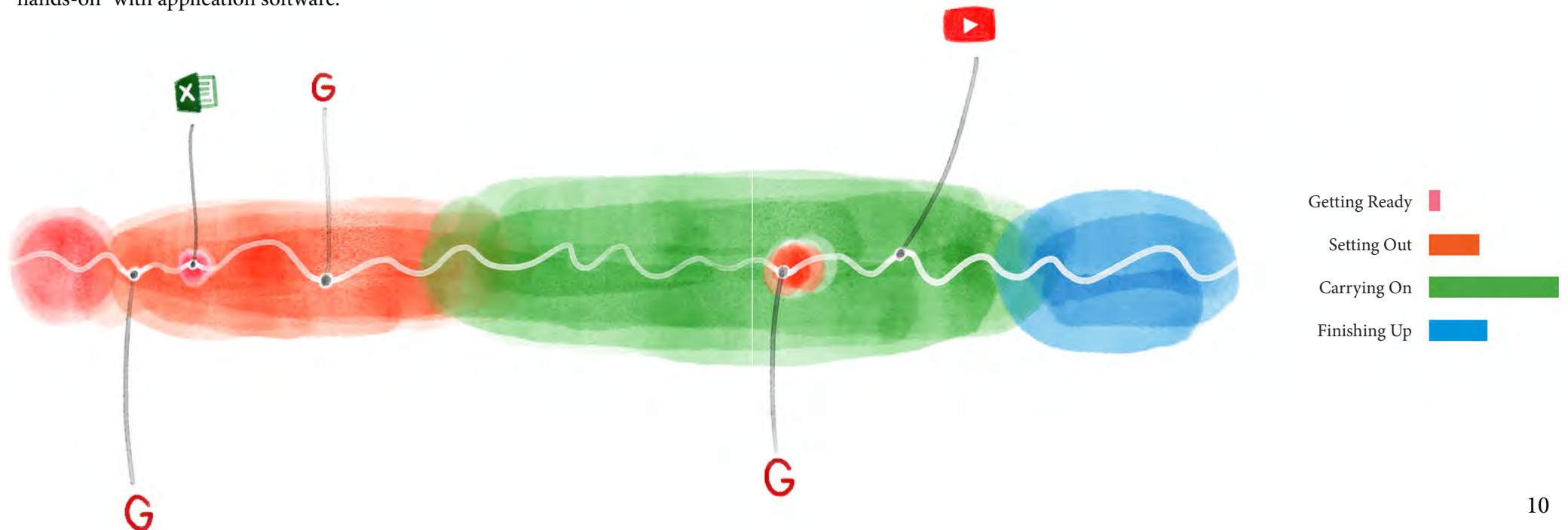
Olivia - Pivot Tables and Macros

Olivia is a 24-year-old female with some post-secondary certification currently studying Psychology as an undergrad. She has over 5 years of work experience across a wide range of fields including food and hospitality, retail, customer service, medical aesthetics, and administration. Olivia chooses the Pivot Table task because she encountered this topic while working for a temp pool at a university research lab.

She begins her search while sitting at home in her living room. An episode of Grey's Anatomy is playing in the background. Although she would find music or television distracting for other kinds of work, she feels Googling for this kind of task does not require the same level of concentration. She has been using Microsoft Office from a very young age, having been introduced to the software in primary school. Olivia does not take notes during the process since she finds it easy enough to remember what to do when doing something "practical" or "hands-on" with application software.



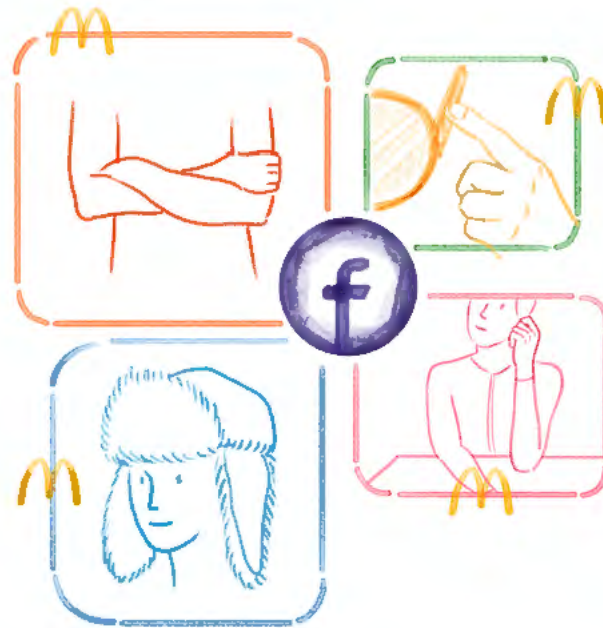
Following a search for "what is a pivot table" in Google, Olivia splits her screen between Excel and instructions from a website and sets out to create a pivot table. Just as she begins to finalise a draft version of her pivot table, she starts a new Google search for "What is a pivot table used for?" She quickly finds a video which she views from start to finish. As a self-described "visual learner", she prefers videos to other resources. She finds these resources more helpful – especially when the instructor narrates slowly while taking the viewer through each step. Having completed the video, Olivia finishes up by closing her Excel file without saving.



Rebecca - Social Media Audit

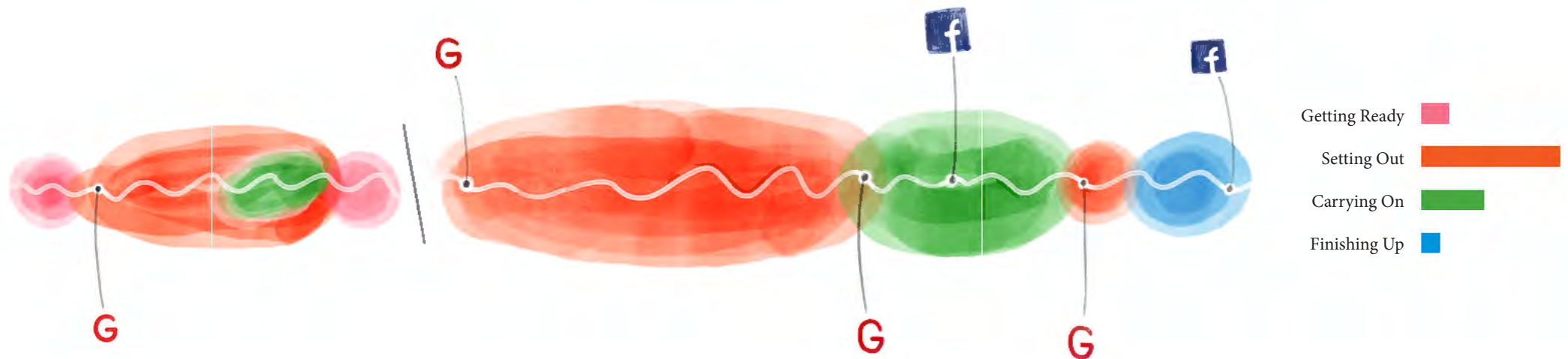
Rebecca is a female in her 40s. She has short brown hair, wide brown eyes, a red zip-up fleece branded with a bank logo, a black fanny pack, and a patriotic fuzzy red felt trapper hat. She has big, round gold eyeglasses that are pushed halfway down her nose.

Rebecca sits in a classroom at the university's downtown campus with her left elbow on the table and her hand over her chin and mouth. Rebecca wasn't able to get Lookback to work on her own computer so she is working on a laptop borrowed from a researcher, whom she asks to set up the pre-installed software, which shows the value of help in the getting ready phase.



Rebecca begins every search with Google: "I use it at home too." Her first Google search is, "how to conduct a social media audit," which leads to an article about how to perform a social media audit. Rebecca slowly reads the website - twice. She moves into doing an audit with later keyword searches like, "mcdonald's on facebook."

Rebecca said that if she was trying to learn about a social media audit at home she would use Bleeping Computer (bleepingcomputer.com), a free online forum where users can register to post questions about computers (hardware, software, application, etc.) and receive relatively speedy answers from other online users.

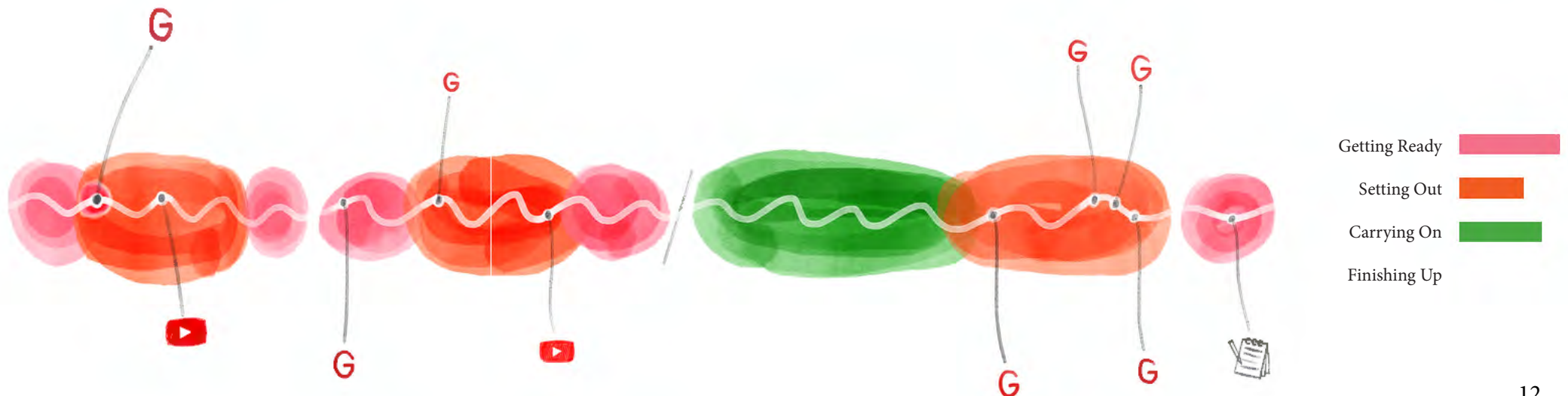
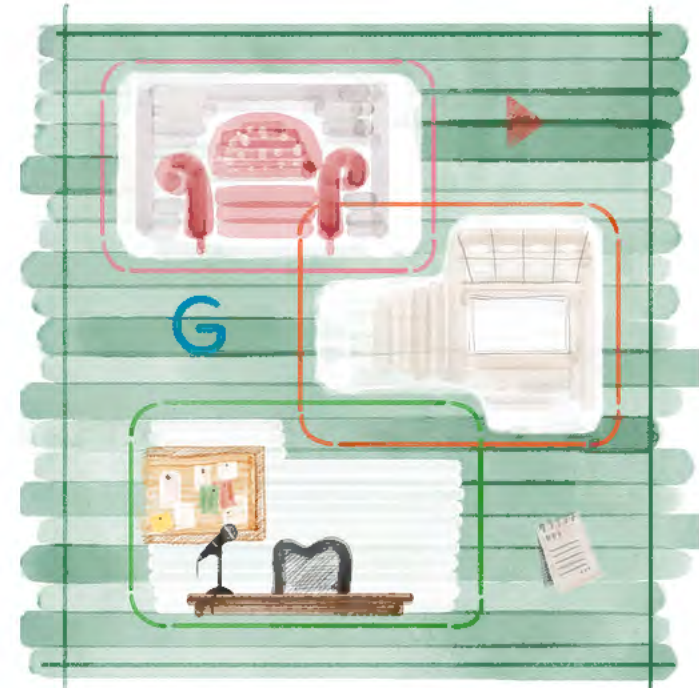


Stephanie - Pivot Tables and Macros

Stephanie is a young female with a bachelor's degree. She has straight long hair and big black eyes. Stephanie learns how to make a Pivot Table in Excel over the course of three videos. In the first video, Stephanie sits on a pink patterned couch in a dimly lit living room that is extremely quiet. For the second video, Stephanie is in a bright white office or classroom that has industrial pop-out ceilings, pot lights, and big windows. In the third video, Stephanie is in a small office that looks like a campus radio station.

Stephanie starts on Google with a series of searches, "what is a data set," "what is a pivot table," "what is a macrotable," and "difference between a pivot table + macro table." She returns in another session to look at the participant instructions. She logs back in for her final session and immediately takes to Google with similar queries to her first search: "what are macros and pivot tables" and "what is a data set." She focuses her search to free online data sets on mental health in Canada, which she uses in Excel.

The video cuts out in a number of periods in the video making it difficult to accurately depict the phases or see if there is a finishing off period.

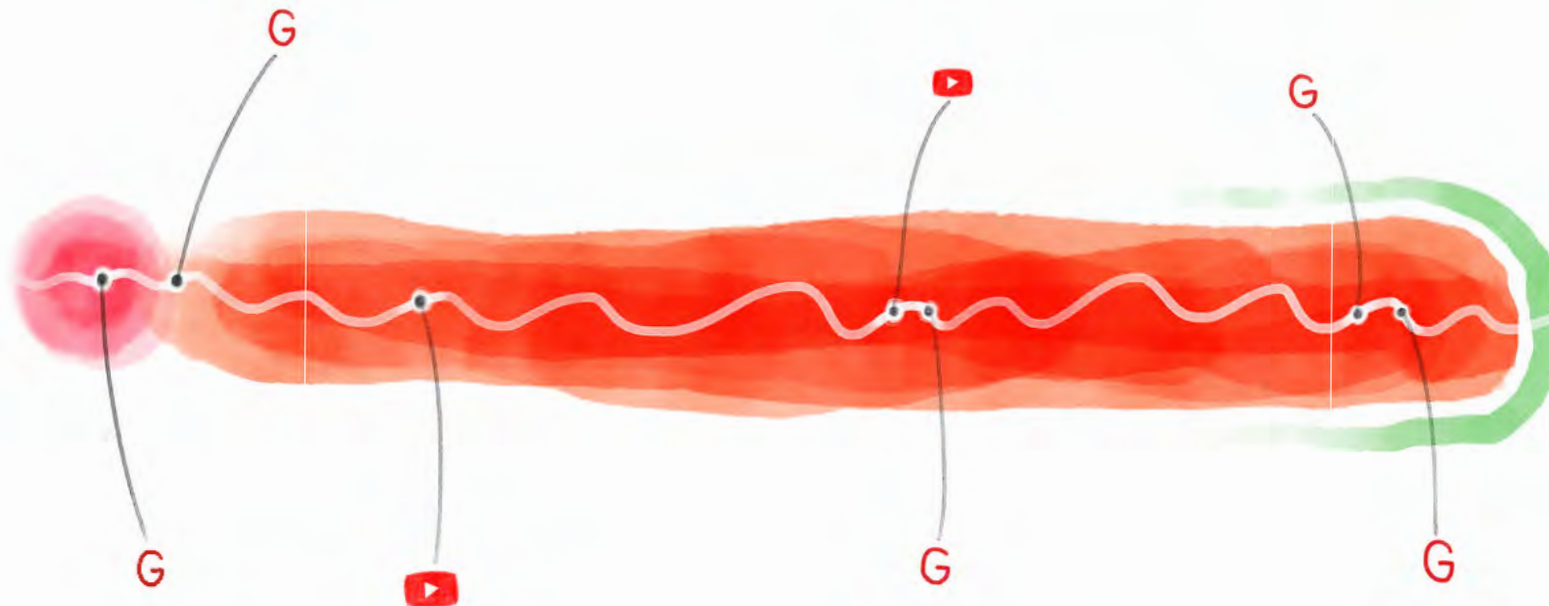


Safiya - Photoshop

Safiya is a female in her 20s who has completed a bachelor's degree. She is currently working in scientific research. Her dark hair is about shoulder length and loosely tucked behind her ears. She wears oversized thin, rose-colored rimmed glasses, Apple earpods, and a bright orange shirt. There seems to be a fan in the room or some other sort of air filter creating a small breeze that continuously flits her hair ever so slightly. She is sitting in her bedroom with her mobile phone. The walls are an off-white and covered with posters of bands and pictures (including one of a large penguin).

After loading instructions and a search browser, Safiya types “what is digital imaging with Photoshop” into Google. The search leads her to a YouTube video, which she says will help her understand digital imaging. She watches the Photoshop tutorial and returns to the existing Google search where she clicks in to read a web tutorial.

Safiya refines her search and sets out to learn digital imaging with Photoshop. She reads step-by-step instructions on a web page. At first she skims the page quickly. She begins to lean into the computer, verbally narrating the instructions and slowing down her pace as she reads, moving her body closer to the screen. The search ends abruptly. Safiya doesn't have Photoshop and doesn't try one of the free alternatives. As a result, she leaves the task still in the process of learning to understand.



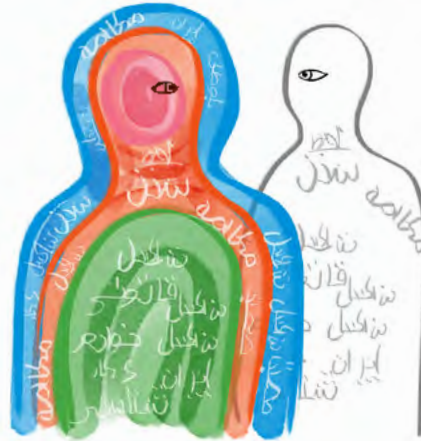
- Getting Ready
- Setting Out
- Carrying On
- Finishing Up

Yasmin - Pivot Tables and Macros

Yasmin is a female grad student in her 30s who is in the process of immigrating to Canada. She has a bachelor's degree from a university in Iran and some work experience. She is studying to complete her MBA and lives with her sister, Yesfir.

Yasmin sits at home on her couch, wearing a black collarless shirt with her auburn hair pulled back, while resting a laptop on her legs. Speaking aloud or mumbling under her breath, she works on her sister's computer to complete the PivotTable and Macros task, occasionally breaking off to speak to her sister in a mix of Farsi and English.

Although her studies are currently in English, she often uses material in Farsi when searching. She is familiar with Excel to the extent that she has used it for "simple functions" like making tables or charts but wishes she could apply these other useful functions in her work. She starts by reading the instructions on a printed piece of paper.



Next, she makes a few Google searches about pivot tables, which leads here to a page on the website "excel-easy.com", where she spends a bit of time reading.

She then restarts by creating an Excel file and returns to Google in search for sample data she could use to learn to use pivot tables. Soon, after finding sample data she can use, Yasmin is shifting between excel-easy.com instructions.

About halfway through the session she switches her focus and begins a Google search about macros. She watches two videos on the topic. As she begins experimenting with macros in Excel, she switches to Google searches in Farsi to find websites about macros. In the last few minutes of her session, Yasmin deletes all of the material she created in Excel, creates a new sheet, repeats a cut-and-paste of raw data taken from a website, and re-runs the macro she has created. She breathes a sigh of relief and silently mouths "There!" before proceeding to close all of the running applications.



Yesfir - Pivot Tables and Macros

Yesfir is a female in her 30s who lives with her sister, Yasmin. She has a bachelor's degree and is taking undergraduate courses in English and accounting. Yesfir has used Excel during her 11 years of work experience, but says she has forgotten how to use it well since leaving her job to immigrate to Canada five years ago.

Yesfir has long, curly auburn hair and wears a thick black sweater as she sits on her couch at home with the afternoon light shining through the Venetian blinds that partially cover the windows behind her. With a laptop on her lap, she reads the printed instructions sheet before calling Yasmin over to confirm in Farsi - their first language - that she properly understands the instructions.

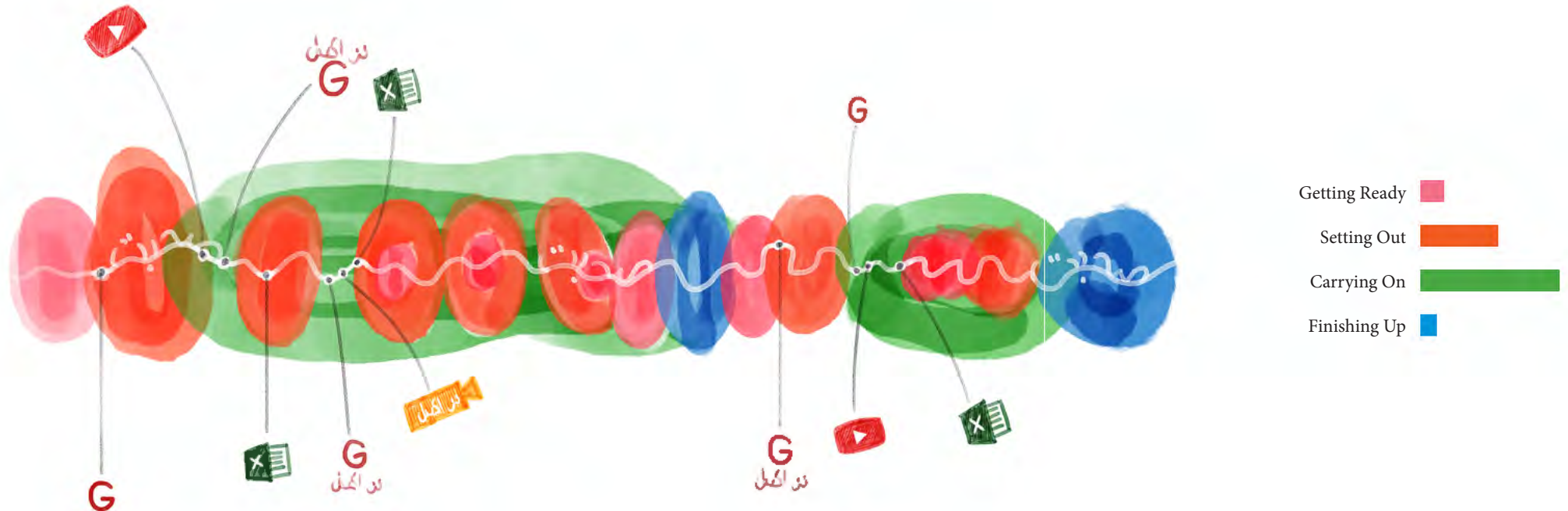
Yesfir prefers using Google's image search results when setting out to conduct her task. She explores images related to Excel macros by clicking on additional keywords provided in the Google search browser. Soon, she switches to writing her search terms in Farsi. She opens an Excel spreadsheet and begins shifting back and forth between Excel and websites she finds with videos and texts with step-by-step instructions in Farsi.



Testing the macro function involves setting Excel to record a series of discrete actions performed by the user. She creates her own data in the spreadsheet and begins testing different kinds of macros. Starting over four times, she uses new sheets to modify the data. Yesfir repeatedly tests these functions until she has created seven different versions of macros. After running through the macros one last time, she finishes up this portion of the task by creating a final, eighth macro.

Returning to her hardcopy of the instructions, she starts over with a focus on pivot tables. Conducting her Google search in Farsi, she consults relevant written and video instructions. Cutting-and-pasting the same data she had used for macros into a new spreadsheet, Yesfir begins experimenting with various pivot table fields, creating three different versions in all.

Suddenly, Yesfir repeats a large sequence of edit-undos to erase much of her recent work. She then creates a fourth pivot table to test out a few last experiments before closing the application.



Proportion



Abra - Social Media Audit



Yasmin



Maria



Yesfir



Olivia



Abra - Excel Pivot Table



Kendall



Allison



Stephanie



Himari



Rebecca



Safiya



Footprints



1- Abra (Social Media Audit)



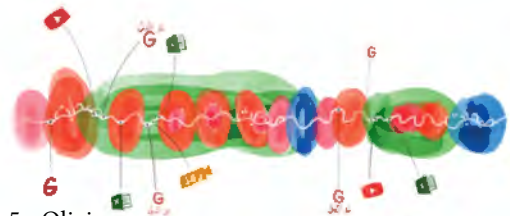
2 - Yasmin



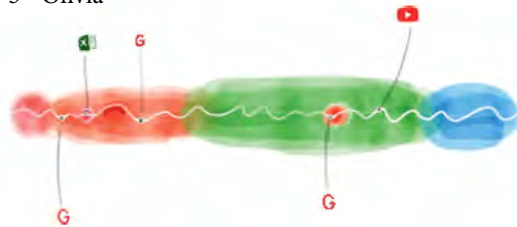
3 - Maria



4 - Yesfir



5 - Olivia



6 - Abra (Excel Pivot Table)



7 - Kendall



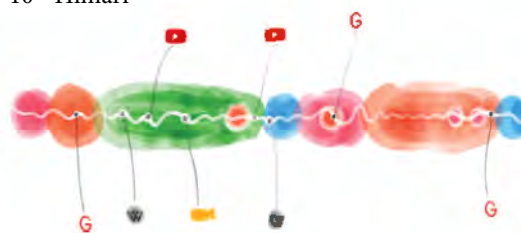
8 - Allison



9 - Stephanie



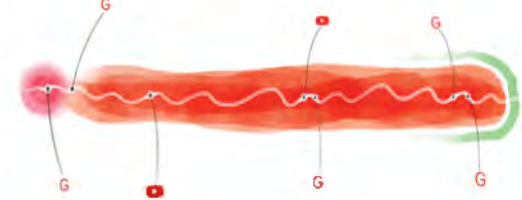
10 - Himari



11 - Rebecca



12 - Safiya



Findings, Discussion, and Conclusion

The first key finding of this pilot research has been the advantages of taking a processual — as opposed to procedural — approach to describing digital skills. These tasks are not step-by-step procedures that can be achieved or learned by following a script. The participants all start with their own version of getting ready followed by setting out, but then move in and out of stages in an intuitive response to the events that unfold. Himari, for example, gets ready, sets out, carries on, sets out, and finally finishes up in a process embedded within getting ready and setting out. Finishing up often involves some combination of reviewing instructions, checking work, and a mini-reperformance of work. The processual quality of digital skills, like any other skill, does not unfold at random but nor is it a linear trajectory. The order that develops through each participant's undertaking points to various factors — spatial, technological, social, cultural, personal, etc. — that shape the task's processual development.

Common sense tells us that skills like strategic communication, visual communication, and data management are more than merely the ability to use specific application software; for example, data analysis is more than being able to make Pivot Tables using Excel. Brands of application software and some of their features, however, are frequently used as a shorthand for skills. Knowing how to use these applications, while not a sufficient condition for claiming mastery over such skills, is increasingly a necessary condition. What we see in the case of *Searching for Tasks* is that the relationship between application software and skill is complex. A task-orientation approach allows us to pay attention to the way in which applications are contingently incorporated into an individual's digital media repertoire (Hasebrink and Hepp, 2017).

Our decision to draw inspiration from Ingold's theory of task-orientation may at first seem counterintuitive to those familiar with his work. Ingold is critical of modern technology, which he conceptualises as “an objectification and externalisation of [human] productive forces” (Ingold p.311). In other words, for Ingold many modern technologies are designed to drive humans to the periphery of the production process. The only possible task-orientation with such technology is to ‘cope’ (Ingold - 332) with them; that is, to find tactics that enable us to re-integrate technology into everyday life in ways that create collective meaning and identity. Although Ingold does not explicitly address them in his writing, it is easy to imagine that digital technologies would fall in this category. If such were the case, our only recourse would be to try to cope with digital technologies. What emerges from our fieldwork, however,

is that application software like Excel, Photoshop, and even Google's search engine — software designed to “carry out a specific task other than one relating to the operation of the computer itself” (OED) — are designed and used in interdependent ways that mediatize human productive forces with those of automated digital technologies like Google's search algorithm or the automated data processing that takes place through Excel's PivotTable function. These applications are not quite tools that extend participants' capacity to skillfully complete their task, nor do they quite fit in Ingold's definition of technology.

The cases described above could therefore best be understood as mediatized skill. In other words, what we are describing in the cases above is a task-orientation for weaving together various human and technological productive forces in ways that include elements of coping with technology and using application software as tools to achieve certain tasks.

To illustrate what we mean by mediatized skill, we can look to how various participants used keywords as tools for searching. Participants iteratively chose keywords from various sources including the task description and notes from verbal descriptions of tasks, which they in turn deployed within their search queries on Google's search engine in different ways at different stages of their search. Keywords like “Excel pivot table” or “what is a pivot table” were important devices for navigating their search process, which we call webfaring – borrowed from Ingold's (2000; 2011) concept of wayfaring. Early keyword searches helped participants understand the task while later keyword searches helped participants do the task. Kendall's first Google search was “online reputation audit”, while later in her task the searches were more targeted, such as “yoga brands” and “Alo Yoga.”

While Ingold sees technification as an attempt to objectify and externalise productive forces from social relations, what we also witnessed were instances of participants developing skills for objectifying and externalising productive forces. The simplest example that perfectly illustrates this is Yesfir's repeated attempts to intuit how to record and apply macros. In this case, Yesfir was not coping with automated technology so much as practicing how to design automations within her task.

References

- Carr, A. and Ly, P. (2009). "More than words': screencasting as a reference tool." *Reference Services Review*, Vol. 37 No. 4, pp. 408-420. <https://doi.org/10.1108/00907320911007010>
- Hasebrink, U. & Hepp, A. (2017). How to research cross-media practices? Investigating media repertoires and media ensembles. *Convergence: The International Journal of Research into New Media Technologies*, 23(4), 362–377. <https://doi.org/10.1177/1354856517700384>
- Ingold, T. (2011). *Being alive essays on movement, knowledge and description*. Abingdon, Oxon; New York: Routledge.
- Ingold, T. (2000). *The perception of the environment: Essays on livelihood, dwelling & skill*. New York: Routledge.
- Ingold, T. (2006). Walking the Plank: Meditations on a Process of Skill. In Dakers, John R. (Ed). *Defining Technological Literacy: Towards an Epistemological Framework* (pp.65-80), New York: Palgrave Macmillan, 2006.
- Ingold, T. (1993). The temporality of the landscape. *World Archaeology: Conceptions of Time and Ancient Society*, 25(2), 152–174. <https://doi.org/10.1080/00438243.1993.9980235>
- Lave, J., & Wenger, E. (1990). *Situated Learning: Legitimate Peripheral Participations*. Cambridge, UK: Cambridge University Press.
- Light, B., Burgess, J., & Duguay, S. (2018). The walkthrough method: An approach to the study of apps. *New Media & Society*, 20(3), 881–900. <https://doi.org/10.1177/1461444816675438>
- Marinov, V., Webb, A. L., & Valter, K. (2016). Teaching is the best way to learn: student-led screencasting. *Medical Education*, 50(11), 1155–1156. <https://doi.org/10.1111/medu.13169>
- Moore, S. (2017). Digital Orientations: Movement, Dwelling, and Media Use. In T. Markham & S. Rodgers (Eds.), *Conditions of mediation: Phenomenological perspectives on media* (pp. 59–66). New York: Peter Lang.
- Nicolosi, G., & Falsaperla, F. (2015). *Open codes: skills, participation and democracy in new technology development / by Guido Nicolosi ; designed by Francesco Falsaperla*. Cambridge Scholars Publishing.
- Patchett, M. (2016). The taxidermist's apprentice: stitching together the past and present of a craft practice. *Cultural Geographies*, 23(3), 401–419. <https://doi.org/10.1177/1474474015612730>
- Pink, S. (2011). Multimodality, multisensoriality and ethnographic knowing: Social semiotics and the phenomenology of perception. *Qualitative Research*, 11(3), 261–276.
- Pink, S. (2015). Approaching Media through the Senses: Between Experience and Representation. *Media International Australia*, 154(1), 5–14.
- Pink, S., & Leder Mackley, K. (2013). Saturated and situated: Expanding the meaning of media in the routines of everyday life. *Media, Culture & Society*, 35(6), 677–691.
- Seror, J. (2012). Show Me! Enhanced Feedback through Screencasting Technology. *TESL Canada Journal*, 30(1), 104–116. <https://doi.org/10.18806/tesl.v30i1.1128>
- Sigaut, E. (1993). How can we analyze and describe technical actions? In Berthelet, A., & Chavaillon, J. *The Use of tools by human and non-human primates*, 381-397. Clarendon Press; Oxford University Press.
- Sigaut, E. (1994). Technology. In Ingold, T. (Ed) *Companion encyclopedia of anthropology: humanity, culture and social life*, 420-459. London: Routledge.
- Sumartojo, S., Pink, S., Lupton, D., & LaBond, C. H. (2016). The affective intensities of datafied space. *Emotion, Space and Society*, 21, 33–40.
- Van Ittersum, D. (2014). Craft and Narrative in DIY Instructions. *Technical Communication Quarterly*, 23(3), 227-246.



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