KeyTouch

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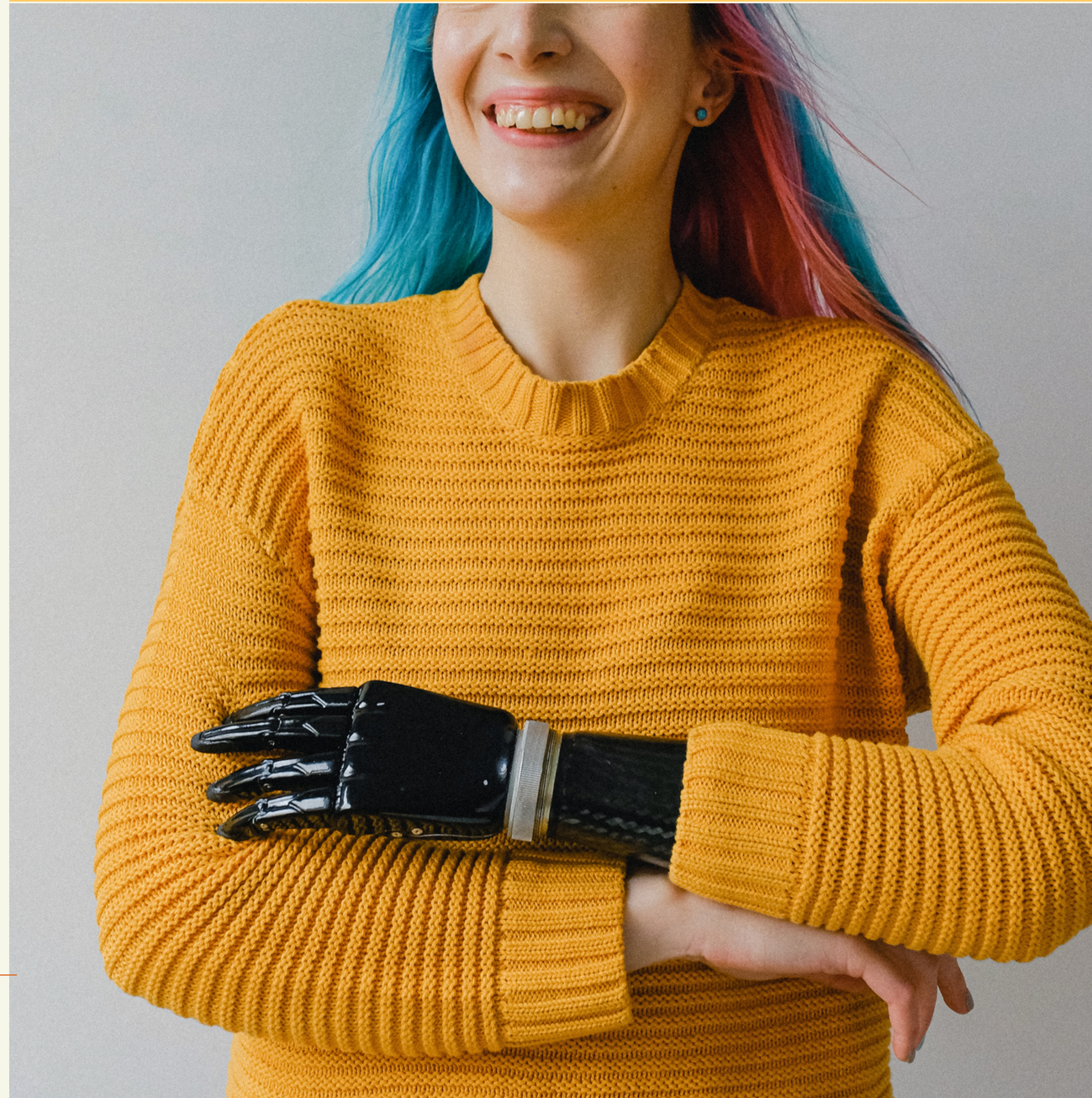
USING PERSONA SPECTRUMS FOR INCLUSIVE DESIGN SOLUTIONS

A report on how researching, developing, and utilizing persona spectrums, with special focus on upper limb disability can strengthen KeyTouch's new keyboard design.



Pitch Deck By

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Why Personas?

"A deep understanding of the user is the bedrock of creating a stellar product."

(Jacobs, 2016)

A persona is a depiction of a typical user, whose goals and characteristics represent the needs of a larger group of users.

- **Includes:** Persona depictions include behavior patterns, goals, skills, attitudes, and background information, as well as the environment in which a persona operates.
- **Impact:** Having personas help us understand what a specific (not generic) user, desires in a product or service.
- **Implementation:** This technique is used to make informed decisions about the users, to guide the development process and to build better user experiences and successful products (Sauro, 2017).

As KeyTouch prepares to design its first prototype of a keyboard for people with motor disabilities, defining personas helps us in 3 ways:

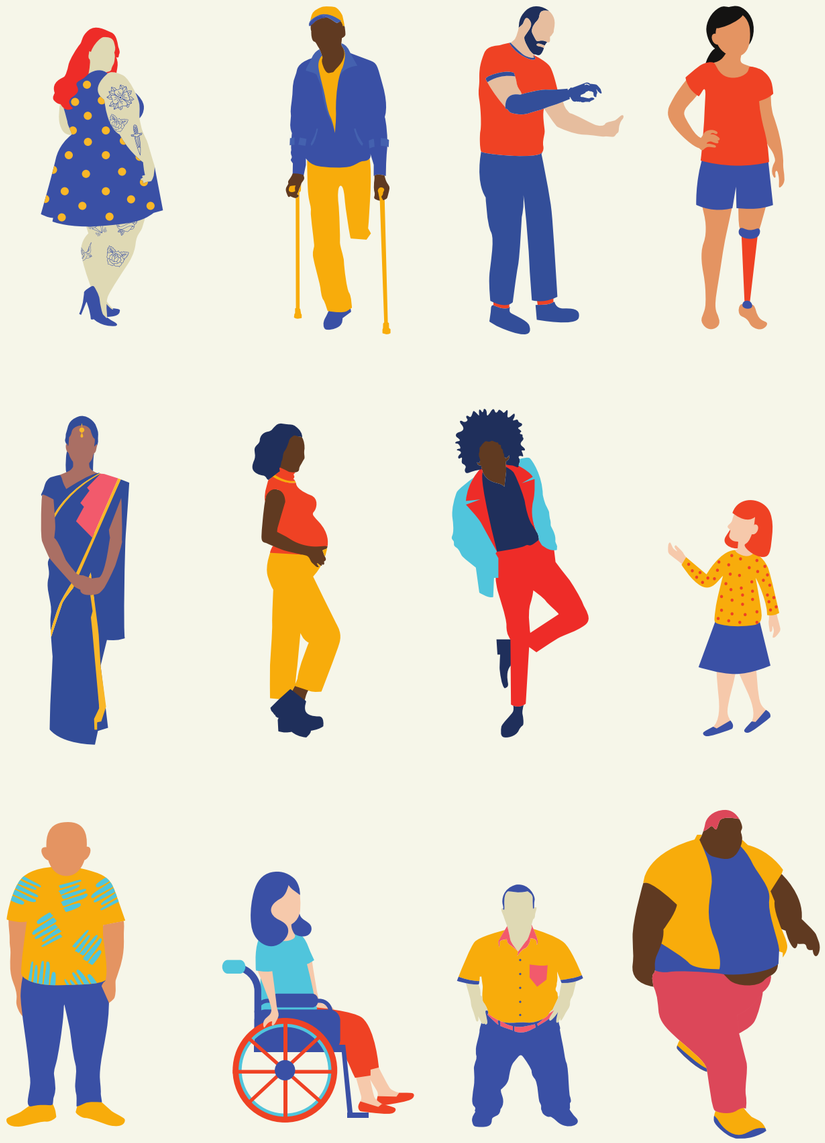
Tell a compelling story	Develop empathy	Visualize user's needs

Inclusive design: a collective responsibility

As designers and researchers, it’s our collective responsibility to know how our work affects the interactions between a user and society, especially to find out whether there is a mismatch. All human beings have intrinsically different experiences, hence they cannot be subject to the same cognitive and ergonomic constraints.
Understanding the limitations of each category of user, while promoting physical inclusivity and being considerate of diversity and cultural stereotypes fosters inclusive design - "creating great products for the greatest number of people" (Microsoft, 2013).

Microsoft's Inclusive Design Toolkit is based on 3 principles:

Recognize exclusion	Learn from diversity	Solve for one, extend to many



Persona Spectrums: one size does NOT fit all

Inclusive design practice embraces human diversity and allows us to be more cognizant of people's varying perspectives and abilities. To create an inclusive design, it is essential to implement human-centered design practices by designing for accessibility, internationalization, varying levels of tech literacy, socio-economic status, race, gender, sexual orientation, and more.

When we design personas with constraints in mind, we foster inclusive design, which opens up possibilities that benefit more users than we might have originally imagined.

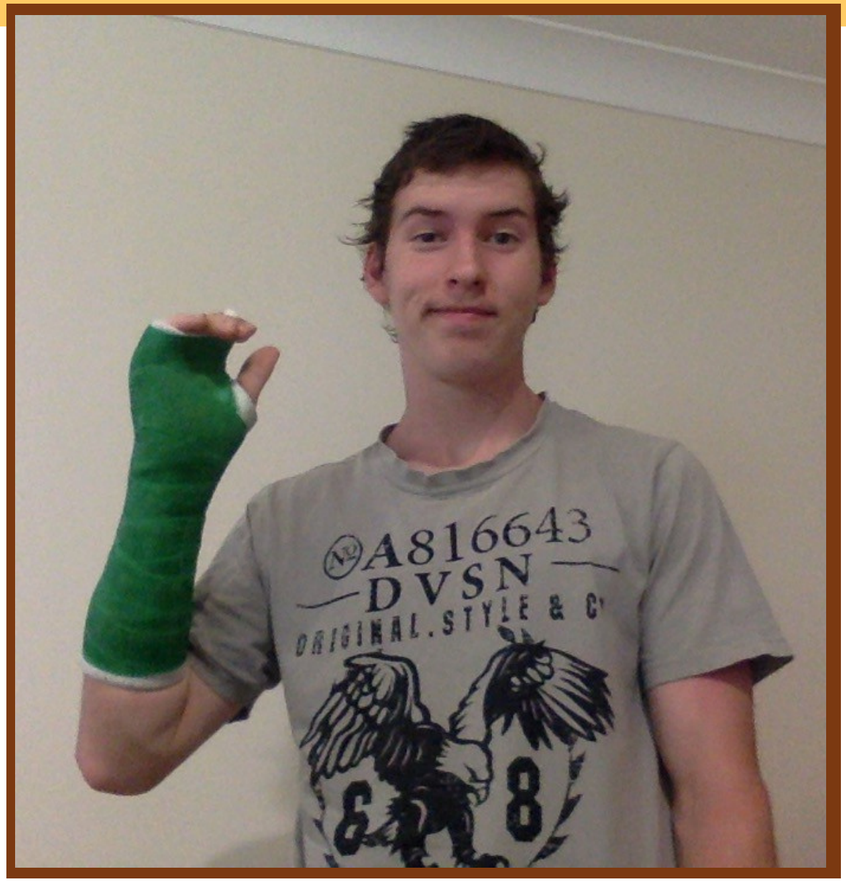
This inclusivity can be recognized by KeyTouch if we understand the value of understanding our users through personas, that celebrate their diversity, understand their characteristics and constraints, and extends this to a persona spectrum- considering the **permanent**, **temporary**, and **situational** limitations of each user.

This report presents a persona spectrum for KeyTouch's new product, keeping in mind users with mobility disorders, specifically upper body disability, for the following reasons:

- Understanding user characteristics (temporary, permanent, or situational) that can lead to usability deficiencies
- Helping the design team make well-informed decisions
- Being aware of user’s prior experience, technical skills, memorizing ability, uses, and overall familiarity with electronic hardware
- Understanding user’s personality traits, such as levels of curiosity, patience, buying confidence level, decision making, self-efficacy, and exposure to media
- Demographics such as age, gender, educational, and cultural background

Jack Glendenning

21	He/him/his	Boston, MA	Computer Science student
Age	Pronouns	Location	Occupation



"As someone who does spend a fair amount of time using a keyboard to produce code, having a broken hand does have it's setbacks."

Bio:

Jack is a 21 year old engineering student, living on campus in Boston. He loves to explore new technology, keep fit, and can often be seen exploring new cafes and restaurants. He codes for a living. A recent skiing accident led to metacarpal fracture in his right hand.

Pain Points:

- Any typing takes a long period of time.
- Special characters required for coding take extra time to reach.
- Typing for long periods leads to severe discomfort.
- Getting timed out before he can finish his internship applications.

Upper Body Limitation: TEMPORARY

Jack's arm is in a cast, numbed for up to 4 to 6 weeks. All his typing needs to be done with his left hand at the moment. Unfortunately, this is the only window he has to apply for summer internships and filling out application forms can be stressful and time-consuming. His typing speed has reduced to 25WPM from 100WPM.

Needs:

- Quick reach to special characters.
- One hand intuitive typing without discomfort to wrist.
- 'Eat and drink while you code' kind of luxury is motivating while working for long hours.

Helena Fischer

26	She/her/hers	Detroit, MI	Artist
Age	Pronouns	Location	Occupation

"The keys are so close together, the keyboard is so smooth your hands are in a very tight confined area and after a while I find that makes me tired."

Bio:

Helena is a 26 year old female living with a roommate and pet cat in Detroit. She is a recovering addict and is suffering from Post Acute Withdrawal Syndrome (PAWS). She has recently bagged a designer internship and also started selling her beautiful illustrations on Instagram.

Pain Points:

- Any typing takes a long period of time.
- On bad days, she is unable to discern between keys.
- Typing for long periods leads to severe discomfort.
- The click clack of keys has been triggering some episodes.

Upper Body Limitation: SITUATIONAL

Symptoms of PAWS include unpredictable and intense mood swings, issues with physical coordination, and depressive, anxious episodes. Helena is afraid that her acute sensitivity to stress might increase her mobility issues and she would be fired from her new job.

Needs:

- Soundless keyboards.
- Visually sensitive and highlighted keys.

Ryan Bishop

50	He/him/his	Nottingham	Unemployed
Age	Pronouns	Location	Occupation

"If I could afford assistive technology that caters to my posture, I would buy it."

Bio:

Ryan is a 50 year old male living alone in Nottingham. He had Parkinson's and is currently using the internet to look for employment. He likes to maintain an enjoyable exercise routine and good posture by daily stretching.

Pain Points:

- Any typing takes a long period of time.
- Completing job application forms or other documents takes too long, and he gets timed out of a page before he can complete it.
- Does tax returns online and types out a page only to get timed out.

Upper Body Limitation: PERMANENT

Individuals with Parkinson's tend to lose their automatic movements. Ryan found using a keyboard difficult due to tremors in his hand.

Needs:

- More options for length of time required by an individual to fill out any forms/pages online.
- Parkinson's disease is likely to affect his gait and posture in the future- he needs all technology and furniture to be as ergonomic as possible.

Adaptations

This table lists the different adaptations used by our persona spectrum to address barriers currently. The table shows 'formal' or manufacturers' adaptations, as well as 'informal' or improvised adaptations (GFK nop, 2009).

Computer keyboards were usually difficult to use because of their size and the spacing between keys. Many noted that a larger keyboard would be easier to use. In particular, laptop keyboards were considered too small which was difficult for those unable to keep their hands in a particular position for any length of time. Laptop keyboards were also felt to be too flat especially when compared to desktop computer keyboards. There was some preference for computer keyboards where the spacing between keys was more delineated.

Technology	Problem experienced	Adaptation	
		Formal	Informal
Computer keyboard / mouse	Only able to type with one hand or a single finger	-	Restricted use to avoid discomfort Got others to type for them
	Typing difficult or uncomfortable Unable to type for long periods	-	Restricted use to avoid discomfort
	Unable to type quickly	Used wrist support	Restricted amount of typing done Got others to type for them
	Laptop keys too close together	-	-

Additional research evidence

A research report on the experience of people with upper-body mobility and dexterity impairments in the communications market (GFK nop, 2009) found that use of keyboards was a barrier to people using the internet and that there was little awareness of the adaptive technologies available. Many users also had fluctuating conditions - for instance, one woman with multiple sclerosis was unable to operate a computer on days when her condition was particularly bad and her hands lacked the strength and dexterity needed to operate a keyboard.

Computer Access Technology (CAT) allows people who have trouble using a standard computer keyboard, mouse or monitor to access the computer (Simpson et al., 2010). 57% (74.2 million) of working-age (between 18 and 64 years of age) computer users are likely or very likely to benefit from the use of CAT:

- 17% (21.9 million) of working-age computer users have a mild visual difficulty or impairment, and 9% (11.1 million) have a severe visual difficulty or impairment.
- 19% (24.4 million) of working-age computer users have a mild dexterity difficulty or impairment, and 5% (6.8 million) have a severe dexterity difficulty or impairment.
- 18% (24.0 million) of working-age computer users have a mild hearing difficulty or impairment, and 2% (2.5 million) have a severe hearing difficulty or impairment.

References

Holmes, K. H. (2016). Inclusive Toolkit. Mismatch. https://katholmesdesign.com/inclusive-toolkit

Sauro, Jeff (2017, May 12) How To Make Personas More Scientific, Measuring user experience blog. Retrieved from https://measuringu.com/scientific-personas/

Jacobs, A.: (2016, September 12). UX: Creating Proto-Personas, https://uxdesign.cc/ux-creating-proto-personas-76a1738401a2. Accessed 2 March 2022

Abbott, N. (2021, May 10). Inclusive Design & the Importance of Accessibility. 3 SIDED CUBE. Retrieved March 3, 2022, from https://3sidedcube.com/inclusive-design-the-importance-of-accessibility/

Glendenning, J. (2018, June 3). Coding with a Broken Hand - Jack Glendenning. Medium. Retrieved March 4, 2022, from https://jack-glendenning.medium.com/what-its-like-to-be-coding-with-a-broken-hand-hint-not-fun-cb843de6e0a1

GFK nop. (2009, September). Experience of people with upper-body mobility and dexterity impairments in the communications market. Michael Thompson. https://www.ofcom.org.uk/__data/assets/pdf_file/0014/32072/gfknop.pdf

Simpson, R., Koester, H. H., & LoPresti, E. (2010). Research in Computer Access Assessment and Intervention. Physical Medicine and Rehabilitation Clinics of North America, 21(1), 15–32. https://doi.org/10.1016/j.pmr.2009.07.006