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**KNOW THE USER**

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A foundational principle associated with human factors engineering is know the user. A user is a person who interacts with a system, product or service. Users include people who operate the system, make use of the output of the system and support the system e.g., including providing maintenance and training.

Sometimes project teams start with the understanding that there are users with different needs, but these teams do not fully understand the underlying characteristics that define these users. Until we fully understand the user, we are at risk of meeting the needs of some while not meeting the needs of others.

The richest data collection method to learn about the user is direct, non-intrusive observation followed by interview. Observations are just that, watch the user doing his or her work. Interviews can take place before and/or after observations, but typically do not take place during the observation. The further we are removed from direct, non-intrusive observation, the more we risk gathering data that does not represent the user’s work, does not represent the user’s need, and will not lead to the appropriate solution requirements. Said a different way, the further we are removed from observation, the more we risk relying on work as described (e.g., work as imagined) and not relying on the way work is actually done.

**Representative End Users**

Representative end users are groups of people with a common set of characteristics who interact with a system, product or service. As an example, when the project team is defining and solving a problem for Employee Occupational Health needs, employee schedulers are not representative end users. Likewise, when the team is defining and solving a problem for Staff Management needs, Employee Occupation Health specialists are not representative end users.

Characteristics that define representative end users might include user characteristics, characteristics associated with context of use, and characteristics associated with the user’s tasks and workflows. Example user characteristics include level of expertise, level of education, percent of time doing direct patient care, etc. User characteristics might also include intrinsic characteristics like impulsive versus reflective work style. Sometimes a defining user characteristic might align with a role. For example, MDs, have role specific expertise associated with prescribing medications; whereas RNs have a different role specific expertise associated with prescribing medications (i.e., executing medication order sets). User characteristics might cross clinical roles. For example, MDs, and RNs receive similar training associated with Health Insurance Portability and Accountability Act (HIPAA) responsibilities and practice. Example characteristics associated with the context of use might include the setting where the representative user carries out his or her work e.g., acute, ambulatory, or long-term care facility or might include specific environments where work is done e.g., Emergency Department patient area versus the Radiology reading room. Finally, a characteristic associated with the user’s tasks and workflows might be how representative end user completes tasks and work flows. For example, different users might document during the encounter, document immediately after the encounter, or document at the end of the day. Taken together, the combination of characteristics defines the representative end user.

**Representative User versus Typical User**

For interactions with health IT applications, there is not a “typical user.” There is a representative end user or multiple representative end user groups. “Typical end user” implies that one person, one end user, embodies all the characteristics of interest. Instead, human factors engineers rely on the concept of a representative end user(s). Think of a data set. We can use a set of sample characteristics e.g., the average and the standard deviation to communicate how representative the sample is of the population. When human factors engineers want to understand the users of a health IT application, we lean characteristics to identify similarities and differences of the people who use that application. Personas are a human factors concept used to identify and describe different user groups based on underlying characteristics (i.e., user characteristics, characteristics associated with the context of use, and characteristics associated with tasks and workflows). Personas can be used to inform user needs, user requirements, and user interactions during the design, development, implementation, and/or acquisition of health IT solutions.

**Stand-Ins**

When it is not possible to interact with representative end users, a project may benefit from interactions with “stand-ins.” Stand-ins may include super-users, subject matter experts (SMEs), and/or project stakeholders. If the project is focused on solving a problem for super-users, then super-users are the representative end users. However, super-users, with their unique characteristics and advanced workflows, are not representative of end users. Similarly, SMEs bring a level of knowledge beyond that of representative end users. Project stakeholders e.g., program office leadership are likely to have extensive knowledge of the user, the context of use, and user tasks and workflows, but their vast project knowledge means they are not representative of the end users. Some SMEs and stakeholders may be removed from the front line where the work is actually done. Some SMEs and stakeholders may have a dual role in that they support the project and they do one day of clinic per month. For a project that is aimed at understanding and solving a problem “in the clinic,” human factors engineers would argue that the knowledge associated with being a SME or project stakeholder defines a specific SME and stakeholder user group but separates those SMEs and stakeholders from being representative end users. When considering the goals of the information being gathered from representative end users and/or stand-ins, project teams must be intentional to acknowledge the representativeness or lack of representativeness from those whom the data is being collected. Project teams must acknowledge the inherent biases, conscious or unconscious, and competing goals e.g., national reporting versus front line operations, of each individual that is included in a data collection activity.

**Caution must be taken!**

If a project team only includes SMEs and stakeholders in user needs assessment and requirements gathering activities, then we will end up with a solution that meets the needs of SMEs and stakeholders but not end users.

In order to design, build, buy, and/or implement a solution that meets end user needs, we must collect reliable and valid data from representative end users. We should aim to match the sample to the known population of users. The greater the match between the sample and the known population of users, then the closer we will be to collecting reliable and valid data (i.e., truly knowing the end user). The greater the mismatch, then the greater the risk of collecting data that is neither reliable or valid (i.e., further from knowing the end user).

When conducting requirements gathering activities, user research, and other project related data collection, project teams must include end users and intentionally determine if we have sufficient representation to know the user.

Look to the next quarterly newsletter to learn how human factors engineering optimizes data collection to truly know the user.

References

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