User Characteristics: Professional vs. Lay Users

Abdusselam Selami Cifter, School of Engineering and Design, Brunel
University, a.cifter@brunel.ac.uk
Dr. Hua Dong, School of Engineering and Design, Brunel University
Brunel University, Hua.Dong@brunel.ac.uk
http://www.inclusivedesignresearch.org/

Abstract
The market success of a product largely depends on whether it correctly addresses the user
needs. Understanding the user is increasingly becoming important in the design process.
Different user models may determine different approaches to design. This paper identifies the
characteristics of different types of users, with a specific focus on professional users and lay
users. It gives a definition of professional users and lay users in the context of adapting
products originally designed for professional use to the use of lay people (for example, home
use medical devices). It summarises, and compares, the characteristics of professional users
and lay users, suggesting that designers pay attention to user characteristics and the context of
use so as to better address user perceptions and meet user needs.

Keywords
Professional users, lay users, technology adaptation, design adaptation

1. Understanding Users: Put it Into Context

Although designers are themselves users, understanding users is a challenge for designers.
Designers tend to design for themselves, but users they design for often differ from designers
themselves. According to Margolin [1], users have become a central theme of the design
discourse, though users still remain little understood by designers.

Thanks to the evolution of technology, today users have access to all types of devices enabling
them to do various tasks, some of which used to be operated only by professionals. In some
market segments, there is a shifting trend from focusing on professional use to the use of lay
people, for example, home-use medical devices, computer accessories, hobby products like

telescopes. As a result, the design focus has shifted from product's function to user's perception and product-user interaction.

According to Liddle [2], there are three phases of technology adoption; enthusiast phase (Hobby), professional phase (Work) and consumer phase (Life). Enthusiast phase is the invention phase where people like to exploit the technology without giving consideration to the complexities and difficulties on the technology. However, after sometime an enthusiast user may come up with an idea to put that technology in a practical way and then invention starts to become an innovation. This is the professional phase where priorities of developers change and become more focussed on costs and prices. In this phase, design must be reliable, consistent and above all useful and usable. After the product has built up enough volumes through the business phase and technology has become cheaper, the consumer phase starts. In this phase product's language changes dramatically with respect to the priorities of the consumers. The design must be easy to use, pleasurable and must present the function in an aesthetic way.

To make the adaptation from the professional phase to the consumer phase easier, a comprehensive investigation on the characteristics of professional users and lay users is required.

2. Definitions of Users

According to Hogg et al. [3], Lay users "are those who have not gone through the training or socialisation into the particular profession (such as medicine, nursing, chiropractic) which we refer to as the index profession."

A professional user, as defined by Lundvall [4], is a user who has a well identified goal for his/her activities, acting within the formal part of the economy.

The end-users of a product can be professional users or lay users (Figure 1). Professional users have good knowledge about the task that they perform with the product: they are trained and they may have previous experience with the product or the relevant task. Likewise, experienced users may have some previous experience with the product or the relevant task, but their knowledge of the task is much more limited when it is compared with professional users. Novice users are new to the task or the product and usually they do not have enough information to perform the task with the device.
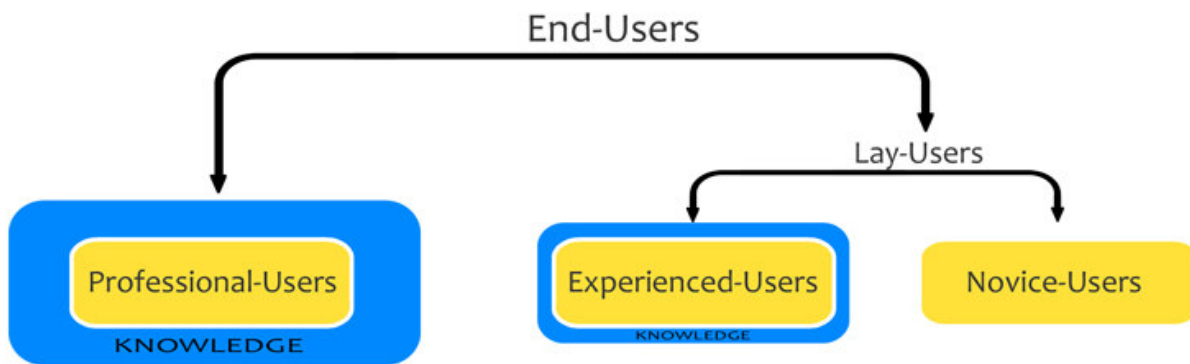
Figure1. Different type of end-users

Knowledge of the task is one of the main factors which separates end-users into two groups as professional users and lay users. However the terms professional users and lay users refer to various types of user groups. Figure 2 shows an instance for the market of medical devices where doctors, nurses and medical representatives can be regarded as professional users while old people, patients and carers can be referred to as lay-users.
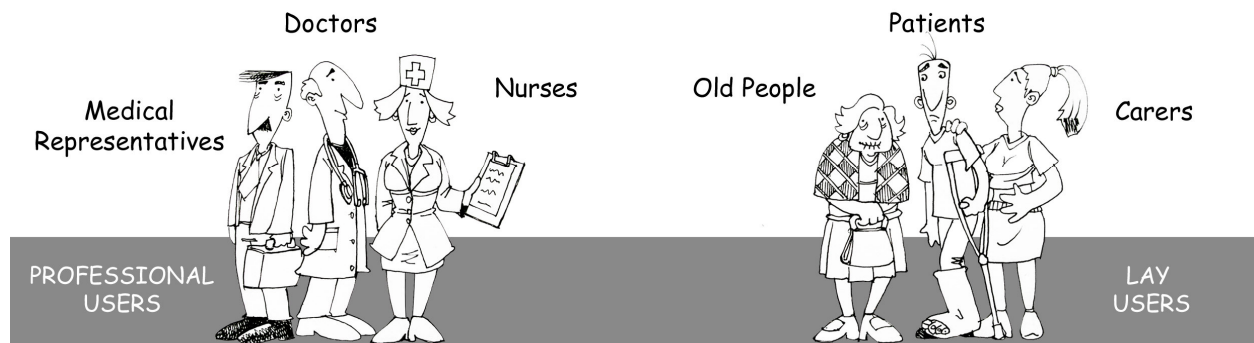

Figure 2. Professional and lay users of medical devices

As suggested in Figure 2, lay users are not a monotype. There are differences with respect to their previous experience. "Users have expectations of how a product will work using it for the first time. These may be based on their previous experience of performing the task before with the previous model of the product or with similar devices."[5] A novice-user could become an experienced user. The progress of this transition is shown in Figure 3: when a user is faced with a new device, he/she makes an interpretation. This interpretation leads to an action and in turn the device functions and gives feedback. The next time when the user is faced with the same task, he/she will refer to the knowledge gained from his/her previous experience.
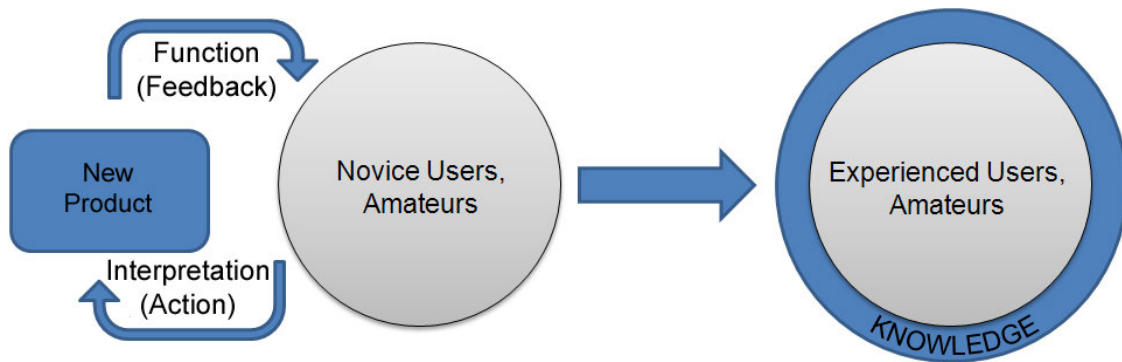
Figure 3. The process of gaining experience

It is interesting to note that amateurs can be novice users or experienced users. According to Lundvall [4], "consumers acting as amateurs involved in hobbies might display a behaviour which is close to the one displayed by professional users…amateurs might be as advanced as professionals in terms of both use and innovativeness."

In this study, professional users refer to the users who have gone through extensive training to achieve particular knowledge which is valuable in a social or economical context.

Lay users are the users who have limited or no training in a particular area, however they are likely to have personal interests or special needs in that area.

3. Characteristics of the Users

Lay users differ from professional users in terms of their **needs and expectations**. Professional users are trained people and the devices they use are related to their expertise area. However lay users vary significantly from age to gender, and they might be people with disabilities.

According to Buurman [6],
    "different from professional users, lay users don't have extensive training for the product
    use. Besides there are no clearly specified users, goals and contexts of use and for lay-
    users, effectiveness and efficiency is less important than pleasure and early success.
    These motivate users to further exploration of functionality and interaction."

Previous experience and intuitive use. Users prefer to understand a product in an intuitive way. This is easier for professional users because they are usually more experienced with the device or are familiar with the tasks. However lay users may not have any previous experience, therefore guessability becomes important with respect to their possible approach to explore the usage of the product. When lay users are faced with a new device for the first time, "they are lack of confidence. They can't understand the issues and situations related to their device and their interaction with the device."[7]

Ability to overcoming limitations and problems. Professional users are usually good at overcoming device limitations.[8] They are often much more capable of operating complex devices, and they respond to unexpected or variable circumstances much better than lay users [9]. In contrast, lay users are not good at overcoming device limitations. They prefer simple to use products with limited functions. Lay users "are poor at overcoming problems and likely to need support in many different forms such as, help with maintenance and servicing, repair, replacements, etc."[7] Besides, they cannot understand specific terminologies. According to Soergel et al. [10], mismatches in representations of information used by lay users and professionals occur at different levels of knowledge representation, such as terminology.

Context of Use. According to Edworthy et.al. [11], "a professional user of a product may use it every day, will be subject to various regulatory bodies, and may be concerned with his or her legal liability. Due to these circumstances they are more likely to follow instructions than lay-users." In addition, the environment where lay users use their products differ significantly from that of the professional users. Generally, professional users use their products in a controlled environment while lay users use them in uncontrolled environment.

Perception and purchase decision. According to Crilly et al. [12], when a user wants to change his/her present product with a new one, prior knowledge may be used to make judgements on attractiveness. Therefore previous experience influences users' purchase decision. Professional users are likely to prefer new products with small changes because of the natural psychological tendency to take the tried-and-true path. For professional users, a product with a radical change means more time spending on learning the new product and waste of accumulated experience [8].

Table 1 compares the characteristics of professional users and lay users.

Table 1. Characteristics of professional users and lay users.

Professional users	Lay users
More control on the products they use	Less control on the product because of the lack of confidence
Good at overcoming problems	Poor at overcoming problems
Well-trained	Little training
Usual able-bodied	Vary from age to capability
Product function reflects their expertise	Product function reflects their special needs
Prefer sophisticated products with a lot of functions	Prefer simple products with specific functions
More likely to recognise errors	Poor at recognising errors
Understands specific terminology	Have difficulty in understanding specific terminology

4. Implications for Design

A better understanding of the characteristics of professional users and lay users will help speed up technology adoption, especially the transition between the professional phase to the consumer phase.

Designing for professional users are different from designing for lay users. Professional users are more concerned with the reliability, consistency and efficiency of the product, whereas lay users are more concerned with easy-of-use, aesthetics and pleasure. When designing for lay users, designers should make their products more intuitive to use, instructions easy to understand and jargon free, and they should take into account different contexts of use. In addition, the journey from novice users to experienced users should be considered by designers, as this will inspire them in terms of how to help the user quickly gain experience from using the product.

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