THE EMPATHY IN THE INTERFACE DEVELOPMENT PROCESS: A study about the usability of washing machine interfaces for elderly people.

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1. Context

The world changes everyday, and so do the people. For elderly the situation doesn't seem to be different, because in order not to feel exclude or outdated, they need to adapt each day to new technologies, which often frustrate and intimidate them in this delicate life phase.

It is common, when talking about old age, to imagine the elderly as decades ago: inactive and outdated. However, the act of growing old over time has lost the negative connotation it once carried in its essence. The scenario has changed, and what we see today is a population over sixty that has been gaining prominence, growing in numbers and vitality every day, becoming a representative portion of society. Given this scenario, it is essential to analyze the new profile of the elderly and consequently, what measures should be taken to better serve them.

In this way, the purpose of this article is understand the current models of washing machines, in order to develop an interface model especially aimed at the elderly, in a segment that, as observed, often does not act with caution towards this public.

2. Method

The design process was carried out through stages, which consisted of bibliographic research, parametric analysis, semi-structured interview and target audience observation, task analysis, conceptualization, construction of concept boards and personas.

Bibliographic research was used to understand the elderly population itself. We investigated the main physiological declines that occurred in this phase, as well as recommendations related to the text for them, regarding the font size, typography and traces employed, to make readability easier. The bibliographic fonts also discussed the particularities of the cognition of the elderly, their process of

insertion in the world of technology, as well as the perception and the search for the reduction of cognitive load when designing interfaces for them. The loss of visual acuity, which consequently results in the difficulty to filter certain colors of the spectrum has also been addressed, as well as the use of familiar icons in the interfaces, in order to make it a way to add to the textual information, transforming the informative set more. Of course, even contributing to the prevention of mistakes.

3. Results

When analyzing current washing machine models it was noted that: (a) The typography patterns found are inadequate for the analyzed age, according to the bibliographic recommendations; (b) There is no concern with the colors present in the machines, which may lead to a decrease in the elderly's quality of vision, given that, with advancing age, there is a greater absorption of some shades over others; (c) Products that convey the idea of technology have too much information, which causes intimidation to users over sixty who, realizing so much modernity, feel fear or shame and sometimes stop buying the product.

With the data obtained from the research and analysis, a field research was done to compare the reality of target users, with information collected indirectly. Through semi-structured interviews, systematic observation and task analysis, it was noticed that the elderly user has difficulties reading and understanding the writing and icons present in the current washing machines, due to their small size. There is also a lack of contrast in some cases between writing or symbology and the rest of the interface, which makes it difficult for older people to see. Regarding the functions present in the machines, the interviewed audience doesn’t use most of them, concentrating only on the quick and common washing modes. This is because they don’t need the other functions and are intimidated by so much information.

The desire to feel updated has been confirmed, there is a desire on the part of elderly to learn what is happening and to stay within the new technologies, however, as already pointed out earlier, the public is intimidated with so much information to assimilate. Therefore, the developed interface contemplates a set of actions that aim to offer elderly a technological and modern product, added to a simple and pleasant use experience, in the scope of legibility and linearity in the use of the functions, in order to facilitate the use and reduce the possibility of errors or difficulties, as well as reduce the number of functions by including only those necessary and used by the public.

The proposed interface has a pattern consisted of five stages: (1) Single button to turn the device on and off, which is to press, avoiding fine handling; (2) Water level selection, lever-operated with

options for extra low, low, medium, high and extra high; (3) Six reduced function central wash mode buttons selection, where the user can choose (a) Quick wash; (b) Common washing; (c) Heavy washing (for jeans, coats and others); (d) Bed, table and bath; (e) Stain remover and (f) Centrifuge; (4) Step advance button consisting of long soak, short soak, shaking, rinsing and spinning and (5) Button to start the process and in any case pause it. The used buttons are designed to be ergonomic, reducing fatigue by not requiring fine handling or force to operate, and have a clean central panel that provides only the information you need, thus dispensing with the sheer amount of information you need, cause confusion and visual pollution.

Regarding the development of the interface, it's esthetics was through the choices of colors, fonts and icons considered appropriate for the public according to the bibliographic consulted. The color pallet chose to use the dark gray as a background, because, according to Farina, Perez and Bastos (2006), this is a color that represents simplification of stimuli, neutrality and maturity, associated with modernity. The other color chosen was the yellow, because it is a color used when wants to contrast something, as stated by the aforementioned authors, besides the main reason is that, with the aging process, the vision does not filter as before the shades of blue and violet (CLARKSON et. al, 2013).

The typography used was “Montserrat”, used for its straight and clear shape, in three different sizes based on bibliography, with differentiation by upper and lower case letters and bold in order to facilitate reading and understanding of elderly, employed in white, for being the tone that represents cleanliness and creativity, being also the most intense of the spectrum (FARINA, PEREZ and BASTOS, 2006).

As for the iconographies, with the function of complementing some of the interface texts, sought, as suggested by the authors Cybis, Betiol and Faust (2010), to employ them in a simple and familiar way, avoiding thick contours and the use of many colors. In this case, yellow was chosen as a contrast to the gray background.

Figure 1 - Developed interface for the third age people.

Source: Authors.

4. Conclusions

In the end, after all of the development focus on elderly population, it was obtained an intuitive, modern and technological interface that, besides of facilitating the usage of elderly, also insert them into the modern context. However, there's a urgent need to the companies, not just of this sector, but also in the others, to act with empathy to understand the needs of this public. Only this way, they will be able to satisfy the elderly's yearnings and promote more and more digital inclusion, in this era the breathes technology and innovation.

5. References

BRASIL. **Estatuto do Idoso** (2003). Lei nº 10741, de 01 de outubro de 2003. Dispõe sobre o Estatuto do Idoso e dá outras providências. Disponível em: <http://www.planalto.gov.br/ccivil_03/leis/2003/l10.741.htm>. Acesso em: 13 nov. 2019.

BRASIL. **Política Nacional do Idoso** (1994). Lei 8.842, de 4 de janeiro de 1994. Dispõe sobre a política nacional do idoso, cria o Conselho Nacional do Idoso e dá outras providências. Disponível em: <http://www.planalto.gov.br/ccivil_03/leis/l8842.htm>. Acesso em: 13 nov. 2019.

BÔAS, Bruno Villas; SARAIVA, Alessandra. **População idosa no Brasil cresce 26% em seis anos.** 2019. Disponível em: <https://valor.globo.com/brasil/noticia/2019/05/22/populacao-idosa-no-brasil-cresce-26-em-seis-anos.ghtml>. Acesso em: 13 nov. 2019.

CLARKSON, P. John et al. **Inclusive design: Design for the whole population**. Springer Science & Business Media, 2013.

CORREIO BRAZILIENSE (Brasil). **Empresas brasileiras ainda ignoram consumidores da terceira idade.** 2018. Disponível em: <https://www.correiobraziliense.com.br/app/noticia/economia/2018/04/19/internas_economia,674810/empresas-brasileiras-ainda-ignoram-consumidores-da-terceira-idade.shtml>. Acesso em: 13 nov. 2019.

CYBIS, Walter; BETIOL, Adriana Holtz; FAUST, Richard. Ergonomia e usabilidade: conhecimentos, métodos e aplicações. 2 ed. São Paulo: **Novatec Editora,** 2010.

DA SILVEIRA, Michele Marinho et al. Educação e inclusão digital para idosos. **RENOTE**, v. 8, n. 2, 2010.

DE LIMA ARGIMON, Irani I. Aspectos cognitivos em idosos. **Avaliação psicológica,** v. 5, n. 2, p. 243-245, 2006.

DE MACEDO, Bárbara Gazolla et al. Impacto das alterações visuais nas quedas, desempenho funcional, controle postural e no equilíbrio dos idosos: uma revisão de literatura. **Revista Brasileira de Geriatria e Gerontologia**, v. 11, n. 3, p. 419-432, 2008.

DE MACEDO, Michel Kramer Borges; PEREIRA, Alice Theresinha Cybis. Desenvolvimento de recomendações de acessibilidade e usabilidade para ambientes virtuais de aprendizagem voltados para o usuário idoso. **RENOTE**, v. 7, n. 1, 2009.

DE MORAES, Edgar Nunes; DE MORAES, Flávia Lanna; LIMA, S. D. P. P. Características biológicas e psicológicas do envelhecimento. **Revista Medicina Minas Gerais**, v. 20, n. 1, p. 67-73, 2010.

DOS ANJOS, T. Pereira; GONTIJO, Leila Amaral. Recomendações de usabilidade e acessibilidade para interface de telefone celular visando o público idoso. **Production**, v. 25, n. 4, p. 791-811, 2015.

DOS ANJOS, Thaiana Pereira et al. Usabilidade e Acessibilidade no Moodle: Recomendações para o Uso do Ambiente Virtual de Ensino e Aprendizagem pelo Público Idoso. **Human Factors in Design**, v. 3, n. 5, p. 23-42, 2014.

FARIAS, Bruno Serviliano. Percepção na terceira idade: pesquisa experimental sobre tipografia para idosos. **Design e Tecnologia**, v. 8, n. 16, p. 29-40, 2018.

FARIAS, Bruno Serviliano Santos; DA CRUZ LANDIM, Paula. Design Gráfico Inclusivo para Terceira Idade. **Human Factors in Design**, v. 8, n. 15, p. 035-048, 2019.

FARINA, Modesto; PEREZ, Clotilde; BASTOS, Dorinho. **Psicodinâmica das cores em comunicação**. 5ª ed ver. e ampl. São Paulo: Edgard Blücher, 2006.

FERREIRA, Anderson Jackle. Inclusão digital de idosos: a descoberta de um novo mundo. **EDIPUCRS**, 2008.

FERREIRA, Mario dos Santos. ERGONOMIA DO ENVELHECIMENTO. **Revista ErgodesignHCI**, [S.l.], v. 4, n. 1, p. 31-40, 2016.

GIL, Antônio Carlos. **Métodos e técnicas de pesquisa social.** São Paulo: Atlas, 1987.

GONÇALVES et al. **Fazendo pesquisa: Do projeto à comunicação científica.** Joinville: Editora Univille, 2014.

IBGE. Instituto Brasileiro de Geografia e Estatística. **Censo 2010.** Disponível em: <https://censo2010.ibge.gov.br/noticias-censo?busca=1&idnoticia=1866&t=primeiros-resultados-definitivos-censo-2010-populacao-brasil-190-755-799-pessoas&view=noticia>. Acesso em: 14 Nov. 2019.

INSTITUTO DE PESQUISA ECONÔMICA APLICADA (IPEA). **Os Novos Idosos Brasileiros: Muito Além dos 60?** Organizado por Ana Amélia Camarano. - Rio de Janeiro: IPEA, 2004. 604 p. Disponível em: <http://pfdc.pgr.mpf.mp.br/atuacao-e-conteudos-de-apoio/publicacoes/pessoa-idosa/Livro%20Os%20novos%20Idosos%20Brasileiros%20-%20muito%20alem%20dos%2060.pdf>. Acesso em: 13 nov. 2019.

INSTITUTO DE PESQUISA ECONÔMICA APLICADA (IPEA). **População idosa brasileira deve aumentar até 2060.** 2018. Disponível em: <http://www.ipea.gov.br/portal/index.php?option=com_content&view=article&id=33875&Itemid=9>. Acesso em: 13 nov. 2019.

KITCHEL, J. Elaine. **APH Guidelines for Print Document Design.** APH, 2011. Disponível em: <https://www.aph.org/aph-guidelines-for-print-document-design/>. Acesso em: 15 Nov. 2019.

KULPA, Cínthia Costa. **A contribuição de um modelo de cores na usabilidade das interfaces computacionais para usuários de baixa visão.** Porto Alegre: UFRGS, 2009. Dissertação (Mestrado em Design). Universidade Federal do Rio Grande do Sul. 2009.

NINI, Paul. Typography and the aging eye: Typeface legibility for older viewers with vision problems. **Clear: Journal of information design**, 2006.

ORGANIZAÇÃO MUNDIAL DA SAÚDE (OMS). **Relatório Mundial de Envelhecimento e Saúde.** 2015. Disponível em: <https://sbgg.org.br/wp-content/uploads/2015/10/OMS-ENVELHECIMENTO-2015-port.pdf>. Acesso em: 13 nov. 2019.

PAZMINO, Ana Veronica. **Como se cria:** quarenta métodos para design de produtos. São Paulo: Edgard Blucher, 2015. 279 p.: il.

PERISSÉ, Camille; MARLI, Mônica. IBGE (Agência de Notícias). **Idosos indicam caminhos para uma melhor idade.** Disponível em: <https://agenciadenoticias.ibge.gov.br/agencia-noticias/2012-agencia-de-noticias/noticias/24036-idosos-indicam-caminhos-para-uma-melhor-idade>. Acesso em: 14 Nov. 2019.

PRODANOV, Cleber Cristiano; DE FREITAS, Ernani Cesar. **Metodologia do trabalho científico:** métodos e técnicas da pesquisa e do trabalho acadêmico-2ª Edição. Editora Feevale, 2013.

REVISTA EXAME (Brasil). **Como explorar o potencial de consumo dos idosos.** 2014. Disponível em: <https://exame.abril.com.br/pme/mocada-bem-animada/>. Acesso em: 13 nov. 2019.

REVISTA EXAME (Brasil). **Poder de consumo da Terceira Idade deve surpreender nos próximos anos.** 2017. Disponível em: <https://exame.abril.com.br/negocios/dino/poder-de-consumo-da-terceira-idade-deve-surpreender-nos-proximos-anos-shtml/>. Acesso em: 13 nov. 2019.

RIBEIRO, Milton. Planejamento visual gráfico. Linha Gráfica, 1983.

ROCHA, Eron; PADOVANI, Stephania. USABILIDADE E ACESSIBILIDADE EM SMARTPHONES. **Revista ErgodesignHCI**, [S.l.], v. 4, n. Especial, p. 58-66, 2016. ISSN 2317-8876.

TAVARES, Marília Matias Kestering; DE SOUZA, Samara Tomé Correa. Os idosos e as barreiras de acesso às novas tecnologias da informação e comunicação. **RENOTE**, v. 10, n. 1, 2012.