



Habitar: A Collaborative Tool to Visualize, Distribute, Organize and Share Domestic Tasks Towards Reducing the Gender Gap in Household Labor

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Abstract. Household work and domestic labor are an integral part of keeping up and maintaining a home. Nevertheless, traditional gender roles are still prevalent in a way that women often spend significantly more time and effort than men doing household chores as a form of unpaid labor. Habitar is a tool proposed to take on this complicated subject, developed through User-Centered Design, it distributes and organizes domestic chores between the inhabitants of a house while promoting active and continuous participation of men and children at home. The interactive and collective platform would allow its users to organize, distribute, visualize and share domestic work with each other, as it frames individual effort in a larger context of collective well-being for those involved.

Keywords: Human computer-interaction · Collaboration · Domestic work · User-centered design · Habit tracking · Gender gap

1 Introduction

Distribution of domestic chores between women and men in most Mexican homes is extremely uneven in terms of both time and effort. According to statistics from the National Institute of Statistics and Geography (INEGI) [1], in 2018 women dedicated an average of 39.4 h per week to domestic and care work for other members of the family, while men only spent 4.2 h per week on the same activities. Outdated notions of gender, such as men being providers who exclusively work outside of home while women must solely take care of family members and housework, are still an important

part of Mexican gender-based social order, which directly leads to lack of involvement in domestic work from the male population.

Within most homes and pertaining all social classes, women bear a disproportionate and overwhelming burden in domestic work, which constitutes a cornerstone in gender inequality. This gender gap negatively affects individual women's physical and mental health, but also has structural consequences, such as: less time for learning, leisure and political involvement, greater obstacles to find a job outside the household, significant limitations to advance academically and professionally, and a greater partaking in informal economies, sacrificing social security and the benefits of formal labor structures in exchange for greater flexibility and more control of personal time [2].

As an interdisciplinary team, we've decided to address the need to work towards a fairer distribution of domestic labor and help create awareness about the importance of active involvement in housework and family care by all genders. According to our research, care and domestic work demand time and physical, emotional and mental effort that needs to be recognized and shared by all members of a household in order to relieve primary caretakers from the overwhelming stress of these tasks.

This paper proceeds as follows. To help us understand our proposal better, in Sect. 2 we revise thematically related applications. This section also entails the different approximations we explored about goal completion rewarding systems.

In Sect. 3, we explain how we identified the main needs our tool aims to satisfy, and elaborate on the creation of user profiles obtained through the *Persona* models suggested by Cooper, Reimann and Cronin [3]. We also describe the development of a "fake door prototype", a Facebook page for our tool, to gauge potential interest in our project and how different users planned to interact with it.

In Sect. 4, we share our experience planning and developing a functional prototype and the feedback we obtained from some of our test subjects. Finally, some conclusions are given as well as insights towards further work.

2 Related Work

Despite some improvement in women's participation in the workforce and public life (according to INEGI, 42.6% of women older than 15 years old are part of the Economic Active Population, and 73% of them has at least one child) [4], their participation in non-remunerated labor is still greater than that of the male population. These circumstances harm the well-being and health of women, and perpetuate stereotypes about male involvement in domestic chores and their dependence on their mothers, partners, and women in general inside or outside their household, to whom domestic labors and caring work are usually outsourced.

There are some apps in the market intended to help in the organization and distribution of domestic chores. As part of our research we took on the gamification apps *Choremonster*¹ and *Habitica*², both try to translate the dynamics of achievements and experience points of Role-playing Video Games (RPGs) to create and stimulate habits in

¹ Available at <http://choremonster.mx.aptoide.com/app>.

² Available at <http://habitica.com/static/home>.

their users. However, these household management apps have an individualistic behaviorist approach, rewarding single task completion with prizes, points and other positive external reinforcement. We believe that this approach is restrictive and doesn't generate an authentic awareness of the shared responsibilities in a home environment. For that reason, we propose a tool that uses the chores assigned to family members to generate graphs and charts explaining the work of each member of the house, similar to apps like *Tody*³ and *Unf*ck your habitat*⁴. We also believe that communication between partners, families and household members is key to make our users aware of their impact in the amount of care and work involved in collective environments through graphs and shared tips from users.

In this way, our proposal seeks to build a lasting involvement of its users in taking care of themselves, their surroundings and the people they share them with, by contextualizing individual work within the collective needs of a home, allowing them to visualize the time and effort they and their peers are putting in, and framing domestic work as a form of self-care.

3 Methodology

In order to detect needs and focus on the development of a solution, we followed the User-Centered Design (UCD) methodology [5]. UCD is a multitudinous approach in which the design process puts the user at its center from the beginning and all throughout, allowing for the construction of **pertinent** interactive systems. The first step of our development consisted of analyzing different challenges aggravated by the COVID-19 pandemic and the consequent shutdown of everyday activities in México. We identified gender gap in domestic work as a structural problem amplified by circumstances like confinement related stress, unemployment and an increased load of domestic work since many people remain in lockdown. We chose to address the lack of involvement of all family members, specially men, in domestic chores and the impact it has on the physical and mental health of the women they live with as the main need to attend.

3.1 Interviews and Detection of Needs

Each member of the team did informal interviews and observations with selected users to look for design problems, needs and opportunities. With the answers that we got from about two dozen men and women from various backgrounds and in different living arrangements, we learned about everyday experiences related to the disproportion in time assigned to housekeeping and cleaning between women and men, cohabitating issues, and the overall perception of male involvement at home. Some needs we identified are:

- Even when men take on household chores, they aren't aware of the total workload involved in housekeeping and often rely on constant reminders and instructions from women to complete domestic or care work.

³ Available at <http://todyapp.com/>.

⁴ Available at <http://www.unfuckyourhabitat.com/>.

- Women are required to not only organize and schedule all of the household work that needs to be done but also to distribute chores and tasks within the inhabitants of the home in a way that feels non-threatening, fair and evenly distributed.
- This often leads to emotional and mental stress in women and anger and frustration in men and sometimes retaliation from them.
- Women are responsible for doing their share of workload and often are also in charge of the duties of other members of the family.
- Women find it hard to talk about this gap with their male peers, which results in difficulties to renegotiate the established division of workload and causes strain in their relationships.
- We decided these problems or needs could be addressed through the following tools:
- Graphs and measurements of home-related tasks available to all family members to make them aware of the amount of time and effort domestic work entails.
- Tools to equally assign domestic chores and, by doing so, help reduce the guilt provoked in women.
- Alarms, lists and notifications to remember and organize chores assigned to each family member.
- Support networks inside and outside of home.
- Clearer and more assertive communication within home.

Through these observations, we obtained useful information about women's habits and the impact of unequal share of housework in their lives. We also learned more about the reasons that keep many men apart from domestic responsibilities, such as: negative feedback from members of their household and lack of experience, self-care notions and networks to address these issues with their male peers.

The User-Centered Design (UCD) methodology offers a greater understanding about users' needs and requirements in order to guarantee a better product or solution. This is of special importance given the complex social and cultural issues involved in gender relations, as well as pertaining to the consideration of all types of individuals in a household to offer a possible design solution.

3.2 User Profiles and Personas

We chose to work with methodologies for behavioral analysis that allowed us to gain more detailed knowledge of our users. With the *Personas* model proposed by Cooper, Reimann and Cronin [3], we created a group of four *personas* to represent the most likely active members of a household—female homemakers, women who work outside of home, men and children—to guide our thought process during development. Having two women *personas* allowed us to take into consideration the differentiated experiences of those who have to attend and solve problems at their houses and those who also perform that role at their workplaces. However, we found out both female *personas* have the goal of gaining more recreational time and getting more rest, and wish to better their communication with their male peers. The male *persona* allowed us to identify ways in which men lessen their involvement in domestic work, e.g. the notion that there are inherently “manly” or “unmanly” chores. We also identified their need to be acknowledged as part of family dynamics. Our fourth *persona* took on the children of

the home, who are learning their role in domestic care and how to be responsible for themselves.

3.3 Storyboards

Once we created our *Personas*, we set out to develop a more detailed insight of the key demographic that would interact with our proposal and the expected reaction to it. Each one of us created a storyboard of our tool being used without sharing them between us. Then, we set ourselves to find the common issues that ran amongst them: the constant presence of an overwhelming physical and emotional burden on women and the need for a fairer share of domestic work and active involvement of all members of the household. Differences aside, all our storyboards also addressed the lack of involvement from men on these tasks. These observations let us define the main need of our project as the development of a notion of self-care and family involvement by all members of the household, encouraged by awareness of shared effort. Our perspective is: *domestic work demands effort and time, but with good self-management, shared responsibility, care and participation of every inhabitant of the household, this work can be less of a burden for women.*

3.4 Inspiration Board

Next, we made an inspiration board to collect references and key themes for our suggested solutions. These include: community, communication, equity, compromise, self-care, caring, well-being, self-management, responsibility (shared and individual), organization, awareness and mindfulness.

The items and references selected in our board were explained broadly in Sect. 2, but it is important to mention we explored various studies about gender inequality at work, self-management apps, and methods of reward for task completion. As mentioned, we believe that our goal of a deeper involvement in domestic chores –mainly from children and men– require organic learning, acknowledgement of responsibilities and a profound understanding of the need for domestic work. Because of that, we chose not to award points or give rewards at task completion, instead our system produces information about performance, time spent and allows users to share tips amongst themselves to instill a notion of responsibility within them.

3.5 Pretotype: Fake Door

To gauge public interest in our proposed tool, we made a pretotype according to one of Alberto Savoia's techniques [6]: the Fake Door. This allowed us to test the Initial Level of Interest in a product in development, yet inexistent, by creating artifacts that suggested its availability. The data we gathered using this technique let us evaluate if our shared proposal deserved further development, as well as test our target audience and their first reaction to our pitch.

We created a Facebook page⁵ with mock-ups of *Habitar*, the name given to our tool. It features descriptions and usages of our proposed tool through images: a desktop site

⁵ Available at <http://www.facebook.com/HabitarApp>.

landing page (Fig. 1), mobile device screens (Fig. 2), and diagrams and illustrations of the system's main features. We purposely didn't explicitly state whether *Habitat* was a web tool or a mobile app, since we wanted to gain insight on this topic from potential users themselves.



Fig. 1. Desktop landing page



Fig. 2. Mobile device screens

The Facebook page itself (as shown in Fig. 3) contains a general explanation of what our tool would do and some of its affordances. *Habitat*'s main Facebook page got 38 followers within a 12-hour period, 81% were women and 18% men; the main post explaining the concept behind the tool reached 5,969 people in the same period, according to Facebook metrics.

Using a social media platform as our main prototyping tool lets us obtain qualitative feedback about our proposal directly from users' comments in various posts. As such, we could confirm that people from all genres and backgrounds liked the general idea of assigning domestic work more equitable between men and women. But most importantly, we could confirm that there is a clear gender gap in the distribution of domestic work that harms women systematically.

Furthermore, the Facebook page includes a button that redirects users to a feedback survey⁶, where they can express their opinions and grievances, and through which we

⁶ Available at <http://forms.gle/MMYkLmGgXVvhX4G19>.



Fig. 3. *Habitar* Facebook page (PC version)

are able to gather data on our audience and identify common trends in people interested in our tool. As it happened in the Facebook page, there was a bigger interest from female users but (see Fig. 4) the gender gap is smaller in the feedback survey: 58.1% for female users, 38.7% for male users and 3.2% who preferred not to answer that question. We also discovered that 74% of this sample comes from the 25–34 year old demographic, this was an insight that our tool could be of interest to people who began living on their own for the first time, whether it be alone, with roommates or partners.

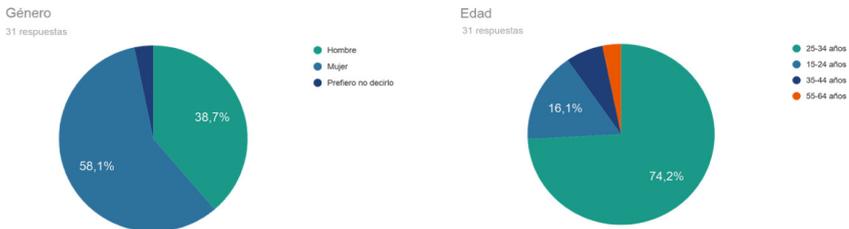


Fig. 4. Survey results of interested users by gender and age

Other relevant information we gathered were the reasons people were interested in our tool, the top two were “to self-organize” and “to know how much time I allocate to my home”, both confirm our initial findings. Finally, we discovered that more than 70% of users who expressed interest in *Habitar* were accessing our site through mobile devices, this reach gave us the insight to decide on a mobile version of the tool. With this information, we started developing a functional digital prototype.

3.6 Digital Prototype

The next logical step in the development process would have been to employ a face-to-face technique to propose potential interfaces for our users to evaluate in a quick and accessible way (i.e. a paper prototype), but due to COVID-19 related circumstances, we instead worked directly on a digital prototype. The proposed tool in our prototype is the mobile version of *Habitar*.

To create this prototype, we first built a wireframe to understand the possible structure, organization and flow of information within and between the elements in the tool, pertaining to the main tasks most likely to serve our users according to our analysis, while taking into consideration their needs and the suggestions obtained in previous steps. While building the wireframe and designing the individual screens, we relied on the ten usability heuristics for user interface design defined by Jacob Nielsen [7, 8].

Next, based on the design and architecture information decisions made in the wireframe, we proceeded to create a digital functional prototype (Fig. 5). Even though the majority of the core tasks and related actions relevant for our users were considered in this wireframe—as well as certain interactions and information flows—the digital prototype focused on what we thought as the most pertinent screens and functions of the app based on the research presented above.

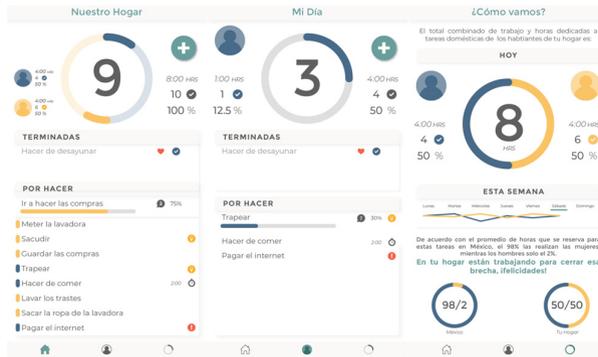


Fig. 5. Prototype main screens

The tool selected to develop the digital prototype was InVisionApp⁷ for its convenience to work with hotspots and pre-made screens, which allowed us to better simulate a mobile application user experience. The first version of the prototype was evaluated by users to obtain feedback and suggestions, thus leading us to update it regarding the graphic representation of shared metrics between users.

4 Main Results

Once our prototype was developed, we selected four users off our main demographic to assess how they interacted with the app and to test our implementation of Nielsen’s heuristics. For that purpose, we designed a trial run that would specifically require our subjects to understand and go through the main functions and points of inference in the prototype in order to achieve a result. Since one of our key project goals was to visualize and highlight domestic work distribution, we first asked our subjects to identify what certain key graphic elements within the prototype represented, to test if they could easily find, understand and make use of such information. Then, we asked them to perform a

⁷ Available at <http://www.invisionapp.com/>.

specific task that would require multiple steps and actions to be completed, in this way, we managed to test different parts of the prototype in the same run, and to not only see if they worked by themselves, but in relation to one another and as part of a unified system.

We observed and took notes while our subjects performed the trial run. Due to the personal and often emotional nature of the themes involved in our work, we thought it extremely important to know the sentiments and personal thoughts subjects had while interacting with our prototype, so we created a survey⁸ they could fill on their own and performed casual interviews with them to gain some insights about their experiences. According to the survey, while all of our test users considered the prototype aesthetically pleasing, they generally thought our system didn't provide them with enough feedback to let them understand what some of the data meant at first use, and as consequence, encountered trouble in performing some actions without additional instructions. Some specific issues to address were the lack of user identification, the need for a clearer indication of assigned chores and instructions on how to complete a given chore; in addition, a number of subjects perceived a lack of achievement at the comfortability heuristic level and they also suggested an improvement at functions pertaining the use of language to better match our system with the way users speak in a day-to-day context.

On the other hand, users also reported that they believe some core functions of *Habitar*, like the option to assign the same chore to many users, the core visual design and the potential to be an aesthetically pleasing tool to help visualize domestic needs and distribute them, were ways that directly address their main needs and concerns. Other suggestions include the introduction of a landing or splash page for simplicity and clarity, improving some of the interaction and the intuitiveness of the app, and a broader capability to customize background and text options.

5 Conclusions and Further Work

Through User-Centered Design methods we propose a tool to help users distribute and manage chores, keep track of the specific nuances required to perform them, generate alerts to signify completion and monitor and compare the involvement of all the inhabitants of the house. The main users of our tool are working women and female homemakers who need to reduce their workload, men who need to understand and practice self and collective care and want to take an active role participating in household activities, and children learning responsibility, autonomy and collaboration.

Our prototypes were developed taking into consideration those ideal users, while we used social networks and online surveys to test the interest in a tool that helps in the organization and assignment of domestic work. The feedback we got was mostly positive and gave us some insight to update our prototype. The test with actual users gave us specific feedback about the information disposition and display, the need to make an intuitive navigation between screens and the need of providing more explicit help to the user.

The feedback we obtained makes it clear that, while the core idea of our tool is useful to our users, there are things that still need to be refined in terms of IA, instructions and

⁸ Available at <http://forms.gle/9C5tXvvBcP5onRv18>.

colloquial language. We hope to continue our work on this project and perform more user tests to assure a tool that can be used by all interested parties, especially as a collaborative tool between people from different ages and genders who share a home, as we believe this is a key issue in Mexican families.

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