RAW
Final Design Report

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Table of Contents

App pitch (max. 1000 characters)

Be impactful: pitch your proposition in a few words. This is not an academic part. It's about catching our attention. How will it change the life of users? What is the USP ("unique selling proposition")?

Are you tired of cooking the same meals? Want to try something new, easy, and helpful for the planet? Then RAW is for you! Immerse yourself in the fabulous world of raw foodism through thousands of delicious dishes, no heating required! Team up with your lovable companion, Dino, who will advise you on this adventure and enjoy meals of his own when you save energy through raw cooking. RAW reinvigorates stale cooking routines with innovative features like smart fridge tracking, automatic shopping list generation, shop-free food suggestions, and much more! Easily save your favorite recipes and master them to impress your friends. Track how much energy you've saved thanks to your tasty new diet. Enjoy a simple and intuitive interface with detailed, step-by-step recipes, and images to help along the way. RAW is the cutting edge cooking app that helps you save time, electricity, and your taste buds. Don't wait, download our app RAW and start your adventure today!

Design Challenge (max. 300 characters)

What should be delivered through design work to make your pitch effective?

To meet user wants, RAW should offer clear interfaces and instructions, improve perceptions regarding raw meals' tastes, and ensure enjoyable cooking. To address needs, it should feature an endearing animated character that reacts to user recipe choices when promoting electricity savings.[1]

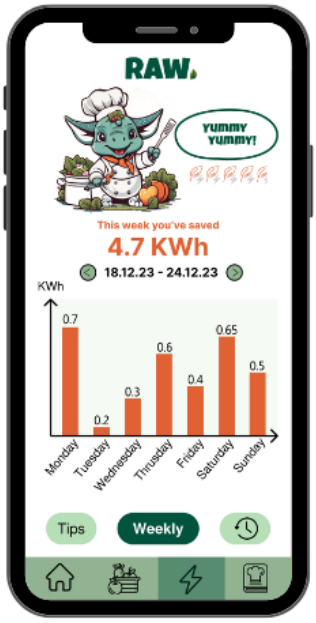
[1] We identified user wants through surveys and interviews (see Appendix). We identified user needs through literature review (see Research Question section).

Your prototype (mostly images + few comments if necessary)

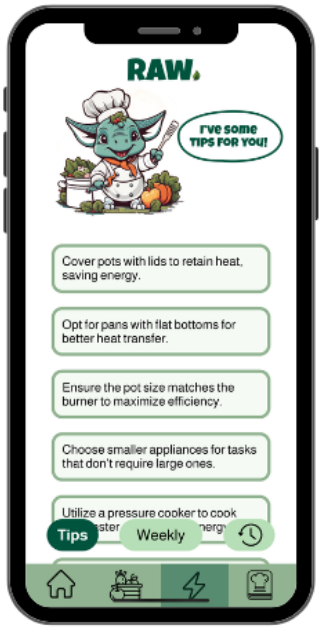
Export your significant elements of Figma. Add short comment if necessary
Show along your mood board, adding just some adjective on the sentiment you expect to raise

Considering the interviews and surveys we performed, which indicated that orange and green evoke thoughts of food and cooking, we created the prototype depicted in the images below.

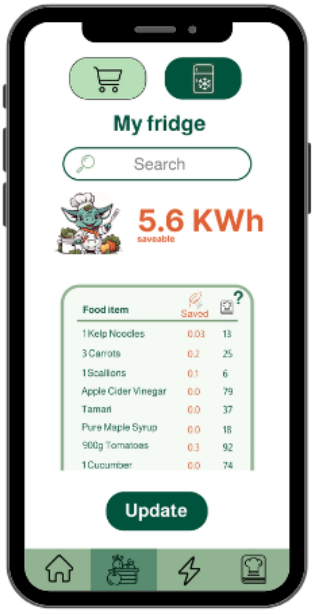
Main page



Energy

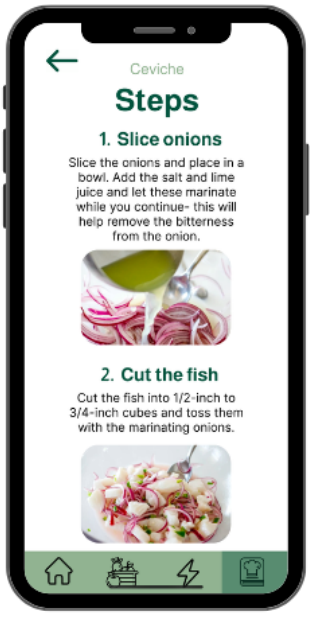


Tips

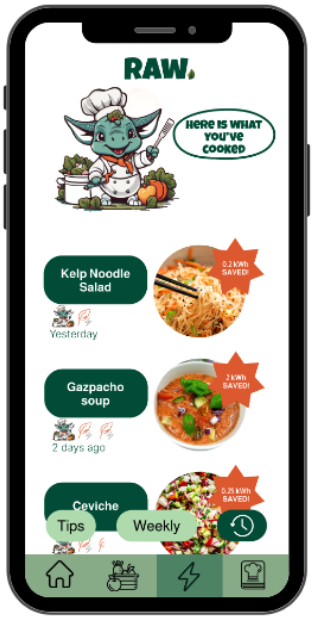


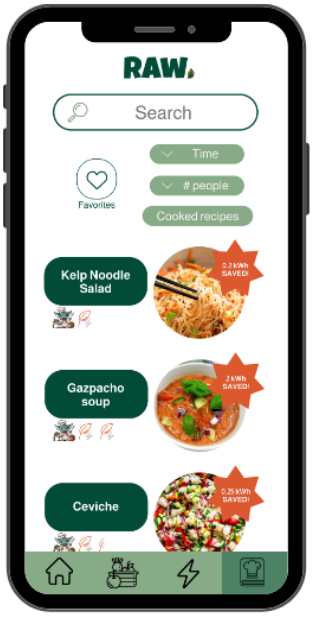
My fridge

Cart



Recipe





Cooking history ***Receipt search*** ***Update fridge with photo***

Our interviews and surveys revealed that cooking often induces stress and is not universally perceived as enjoyable. Consequently, our mood board aimed to counteract these negative emotions with the following positive emotions and values: control, peace, optimism, efficiency, harmony, and a sense of calm. Additionally, we sought to convey a connection with nature and a commitment to responsible energy consumption.

Fig. 1 Moodboard for the design of RAW

Research Question

What should we understand to reach adoption and sustainable impact?
Keep in mind that it should be measurable (quantitative + qualitative observations)

Research finds consumer behavioral changes to be “the most promising energy conservation tactic” in the kitchen [1] and that emotion motivates energy consumption changes [2], especially when emotional appeals come from interpersonal connections [3]. Our app therefore aims to reduce electricity consumption in kitchens by propagating raw foodism - the practice of preparing meals with uncooked ingredients - through simple instructions and emotional connection to a digital character. We want to achieve broad, long-term efforts in kitchen electricity reduction, and believe fostering an emotional bond between people and a virtual pet that tracks energy conservation is effective in this regard.

Our prototype stage research questions were:

1. Can recontextualization of raw cooking increase its uptake?
2. Is intervention at the shopping stage as viable as intervention at the cooking stage?
3. Is the relationship between raw recipes and energy conservation intuitive for users?

Following feedback on our prototype and original research questions, we also recommend the following launch stage (future) research questions:

1. What share of daily meals are prepared raw following exposure to recontextualized raw foodism?
2. What is the balance of raw food behavioral modification between shopping and cooking?
3. How elastic are recipe choices to associated electricity savings?

User Tests (graphs, comments, short texts. Max 2000 char)

What are the main results of your tests, quantitative results and qualitative observations?
Stay here on facts: quantitative, qualitative, personal observations, etc.

User testing consisted of five individuals performing ten tasks within RAW as well as sharing their thoughts on RAW and raw cooking, all in a time frame of 20 minutes per user. The following two graphs display how the five different testers rated RAW regarding diverse user experience parameters (one line per tester per graph; the ten tasks that informed these ratings can be found in the Appendix):

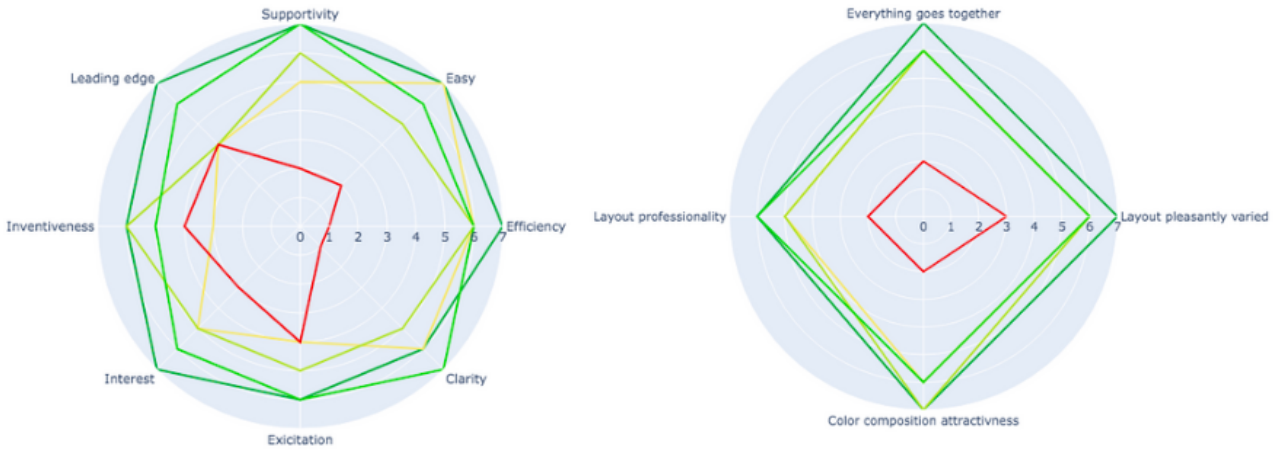


Fig. 2 Quantitative results for user experience (left) and aesthetics (right)

While one user had a rather negative reaction to RAW, four of our testers gave RAW high ratings (5-7 out of 7) on most metrics. Nonetheless, two UX metrics have relatively low averages *and* relative consensus (meaning no outliers dragged down the average): inventiveness (4/7) and leading edge (5/7). We address ways to improve these two metrics in the Evolutions section below.

Regarding emotional metrics, our testers' ratings yielded the averages in the following table:

Emotion	Valence	Calm	Control
Grade	3.8/5	4.6/5	3.8/5

Table 1 Quantitative results for user emotion

Responses to all three emotional metrics leaned positive. Recall that we sought to capture both control and a sense of calm with our mood board in an effort to recontextualize cooking as a pleasant activity. As a result, we were particularly proud to see such high ratings for Calm and positive (if not as high) ratings for Control.

Positive qualitative feedback complimented RAW's fluidity, with multiple testers saying they would be interested in using RAW and one comparing its tidiness to the New York Times cooking app. Almost all testers said RAW changed their perception of raw foodism in a fresh and appealing way.

Our primary constructive feedback concerned Dino and the electricity saving metric: most testers had trouble understanding the metric even after it was explicitly defined, and none were

exposed to our home page long enough to connect users' electricity savings with Dino's food.[2] We address ways to resolve this confusion in the Discussion section below.

Finally, most other comments received during feedback were minor and/or unrelated to electricity savings.

[2] Regarding our electricity-saving metric: we calculated the amount of electricity it would take to cook all of a recipe's constituent ingredients on an electricity-powered stove top. We arrived at this metric because it doesn't assume what a user would have cooked if they hadn't used RAW. Rather, it captures the electricity usage a user has 'prevented' by using ingredients another person could have purchased and cooked non-raw with instead.

Discussion (max 2000 char.)

Discuss your results regarding your initial hypothesis, the literature review and the state of the art. What are the original learnings emerging of your work?

We are proud to conclude we have met user wants. That we were able to package a relatively unknown and perhaps even jarring cooking style as a peer to a state-of-the-art (SOTA) cooking app tells us we succeeded in recontextualizing raw cooking as appetizing and pain-free, thereby reducing the largest barriers to uptake and, according to research into kitchen energy usage [1], unlocking a fruitful path toward electricity reduction. Barring some confusion over interface similarity between our fridge and shopping list features, RAW enables this path in shopping as well as cooking, with most testers seeing value in our functionalities for both. The answer, then, to two of our original research questions (1: can recontextualization of raw cooking increase uptake? 2: can RAW make a difference both for shopping and cooking?) appears to be yes. To our knowledge, this finding is entirely original to this project.

Unfortunately, even if most testers were intrigued by raw cooking's relationship to electricity savings, they did not find the relationship between raw recipes and energy conservation intuitive. In other words, the answer to our third original research question is "not at this stage". We hypothesized that tying electricity to an animated character might fuse electricity-saving decisions with emotional stakes. The issue we discovered is that this implantation cannot occur if the animated character's relationship to user decisions isn't obvious. To avoid user confusion, we could present a real-world corollary alongside our kWh metric (eg 2kWh = 1 hour of television usage). Coupled with an in-depth tutorial upon initial sign-in and changes that enable in Dino diverse responses to user decisions, we believe we could fully meet user needs identified in the research - namely, an emotional stake in electricity-saving behavioral decisions [2, 3] - and unlock a path toward electricity reduction not yet present in SOTA substitutes.

Evolutions (max. 1000 char.)

What would you change on your project, if you had more time to improve your prototype

In addition to giving Dino more emotive range, future iterations of RAW could become more inventive and leading edge by allowing Dino to ‘evolve’ (as in the Pokémon franchise) when users generate enough raw-cooking electricity savings in a given time window. This evolution would produce a different art style for Dino and unlock an exclusive set of recipes, increasing users’ emotional investment in our app and rewarding continued usage. Dino and the exclusive recipe set would ‘reset’ after a certain amount of time to ensure the incentive is ever-present.

RAW would also benefit from a feature in which users can submit their own raw food recipes. Fellow users would test and recommend these recipes while RAW would calculate electricity savings, effectively crowd-sourcing discovery of the tastiest, most electricity-friendly recipes. Such a feature would cultivate community identity among RAW enthusiasts and generate a one-of-a-kind recipe collection dedicated toward electricity reduction.

Self-reflexion on the process (max, 3000 char.)

Remember the different steps of our process (take the plan of the course).
Summarize their impact on your project.
Explain what you would change/ improve in your work if you were going through it again, and create a real prototype.

We might approach the earlier stages of the double diamond structure differently in a future project. RAW did not solidify as our project idea until we discovered that education focused on household kitchen behavior was an overlooked avenue for electricity curbs [1]. Because this only occurred during literature review, next time, we might focus on literature review *first*, use the most striking ideas to develop concept cards, and only then supplement our concept with cultural references and SOTA applications. This would give us a bit more focus in the initial stages (though it may be the case that with more design projects under our belt, our team would learn to find focus in the existing structure).

If the research wall gave us the user 'needs' we would target, our surveys and interviews identified user wants, making them essential to the process. We recall spending a good amount of time winnowing down our question list so as not to overburden survey respondents. Still, one fruitless question about energy saving habits in the kitchen (fruitless because there is strong incentive to lie about one's own energy saving habits) made it through. If we ran another survey for this prototype or another project, we would narrow the questions even further while emphasizing open-ended responses, which helped us most to make feature decisions.

We should have thought more about electricity in the wireframing stage. Looking back, we may have overemphasized user wants while wireframing, saving decisions about electricity conservation's design aspects for when we transformed our wireframe into the full prototype. Solidifying an intuitive presentation of the electricity metric *before* tying it to recipes and Dino would have paid dividends during user testing. Even so, we would faithfully repeat our division of labor during this stage. After agreeing upon the wireframe together, we divided up the Figma frames and tackled prototype development individually. This meant each of us could bring our own unique feature ideas to the final product. Bound by the wireframe and learnings from our interviews and surveys, none of us produced such a distinct product that the final design was difficult to unify, yet we still had the freedom to make marginal contributions we might not otherwise have made - the electricity-saving metric icon, for example.

Finally, user testing was the most fruitful step in our process. The slew of feedback we received not only gave us insight into how RAW could make associated electricity savings more intuitive for the user, but it also gave us practical experience that breathed life into design learnings we'd heard in lecture. For example, to us, the difference between RAW's shopping and fridge pages was evident. Less so for users whose brains reacted to quite similar design elements on both pages by assuming more similarities in functionality. We would host earlier and more frequent rounds of user tests if we designed a real prototype.

Beyond your project

Based on your experience and your learnings, try to think about a topic which would be essential to investigate through design research. Explain why.

We believe design research could make inroads into solving the loneliness epidemic.

Practically everyone wants more close social contacts. Many struggle to understand what they need to do to make this happen. Instead, they frequent popular digital applications like Facebook, Twitter, Instagram, and dating apps, which often pull people away from each other through polarization, negative feedback loops, and commodification. While applications like Meetup do exist to more directly tackle loneliness, the mismatch between want and need remains vast. The inability of current SOTA applications to engage with human psychology in a constructive way and thus resolve the universal issue of loneliness means it is ripe for the application of design research.

The benefits of investigating this topic would ripple into other sectors. While researching possibilities for an electricity-reducing app, we discovered that involvement in a low-carbon community induces behavioral change [4]. It struck us that many of the pressing societal issues we need to address - climate change, trust in government institutions, health outcomes, poverty - would be easier to tackle if people were more socially connected to their communities. Indeed, before settling on RAW, we considered developing an app to encourage people to engage in electricity-intensive activities together rather than on their own, which could, for example, significantly cut into electricity usage peaks seen on weekday evenings for entertainment consumption [5]. Loneliness reduction's positive knock-on effects are hard to overstate.

Finally, every stage of the design process would be met with enthusiastic participation or bountiful material to study. There exists plenty of research into loneliness' effects and its potential solutions. A preponderance of SOTA applications try to tackle this issue directly or indirectly (we mention a few above). Researchers could be assured both interviewees and survey respondents would have opinions to share, and that these opinions might conflict with reality, yielding valuable challenges to be overcome. It may not be easy to solve loneliness, but it would be relatively pain free to apply the rigorous design research process in this domain. Important, too.

Summary:

- Design research could ameliorate loneliness by addressing unmet user needs.
- Existing SOTA alternatives for loneliness reduction often have an adverse effect.
- Reducing loneliness would yield positive externalities at a societal level.
- Plenty of resources relevant to the double-diamond process exist for loneliness.

References

[1] Hager, T.J. and Morawicki, R., 2013. Energy consumption during cooking in the residential sector of developed nations: A review. *Food Policy*, *40*, pp.54-63. DOI: https://doi.org/10.1016/j.foodpol.2013.02.003

[2] Carrus, G., Tiberio, L., Mastandrea, S., Chokrai, P., Fritsche, I., Klöckner, C.A., Masson, T., Vesely, S. and Panno, A., 2021. Psychological predictors of energy saving behavior: a meta-analytic approach. *Frontiers in Psychology*, *12*, p.648221. DOI: https://doi.org/10.3389/fpsyg.2021.648221

[3] Yang, S., Yang, Z. and Zhao, W., Convincing with Reason or Moving with Emotion? An Exploration of Interpersonal Influence Strategies on Household Energy-Saving Behaviors. DOI: https://dx.doi.org/10.2139/ssrn.4596543

[4] Heiskanen, E., Johnson, M., Robinson, S., Vadovics, E. and Saastamoinen, M., 2010. Low-carbon communities as a context for individual behavioural change. *Energy policy*, *38*(12), pp.7586-7595. DOI: https://doi.org/10.1016/j.enpol.2009.07.002

[5] Morley, J., Widdicks, K. and Hazas, M., 2018. Digitalisation, energy and data demand: The impact of Internet traffic on overall and peak electricity consumption. Energy Research & Social Science, 38, pp.128-137. DOI: https://doi.org/10.1016/j.erss.2018.01.018

Appendices

Useful links :

Figma board for prototype design :
https://www.figma.com/file/uChBlWXn79tyvZ4eH9Vyzm/2324_G3_Design?type=design&node-id=348-819&mode=design&t=RL5y2VkH3o8KKOzG-0

FigJam board for double-diamond process :
https://www.figma.com/file/bPcYLmvilh7ySHNH6uiBRC/2324_G3_FigJam?type=whiteboard&node-id=0-1&t=8OSZS6B9l4J2mPVW-0

Online survey for field study:
https://docs.google.com/forms/d/18WEzHcO_FyHLtXcyCcXcBrbYRDTEfT5073wc5zkdMkg/prefill

Individual interviews for field study :
https://docs.google.com/document/d/1iuS_2890gyA3iq3xBl5l2X_GO4GnCYzvMlOQzeCUZvA/edit?usp=sharing

Survey for prototype user testing :
https://docs.google.com/forms/d/1rrTlidTAkET16OCJAxskyPkhf1UC_Sz5wAdmYvxwCoc/prefill

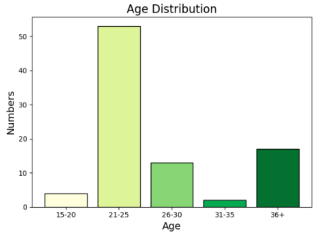
Tasks for prototype user testing :
https://docs.google.com/document/d/1c8FReu2HvE6lFaPn69B7KbRMQFRJ_6ql7h-3hDq2oyM/edit?usp=sharing

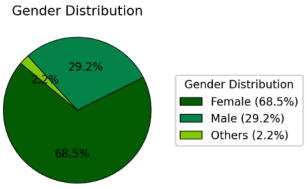
Animated pet ideas :

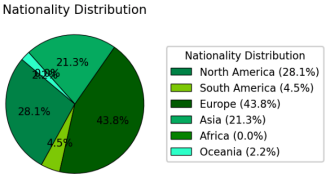
https://playground.com/login?redirect=/canvas/s4azxjp5piridrj4h8vzz59al

Graphs from our field study survey (created in python):

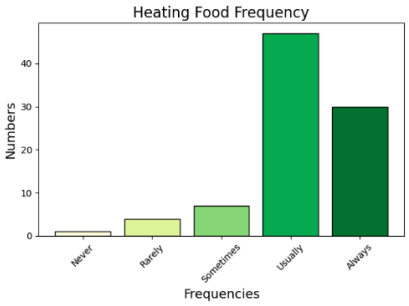
Who answered the survey ?

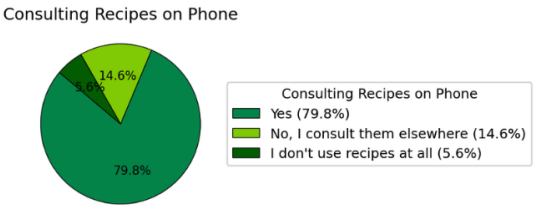




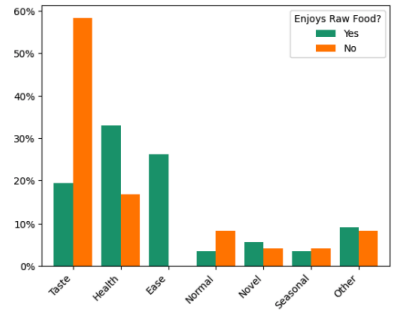


What are the cooking habits ?

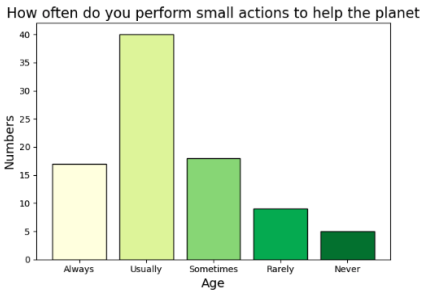




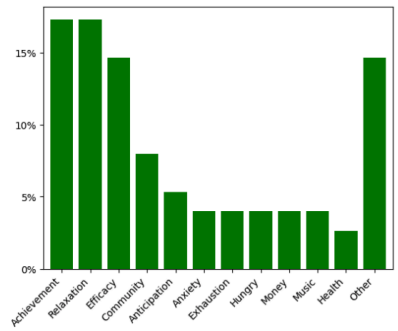
What do people think about raw foodism ?



Are people doing small actions to help the planet ?



Why do people like cooking ?



Why do people not like cooking ?