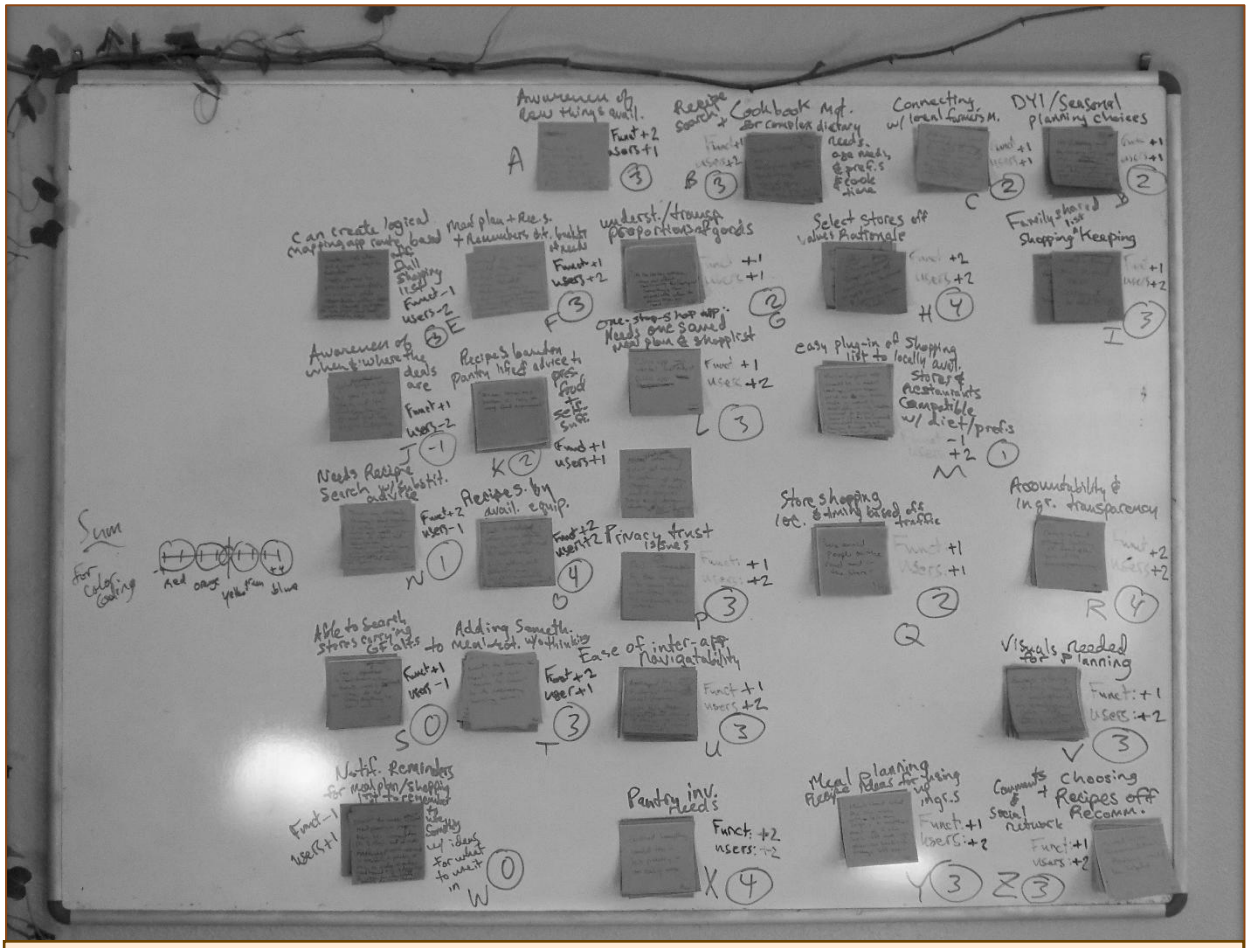
Meal Maven User Experience:

Exploratory and Generative UX Research Report



Abstract:

This UX research report explores meal planning through diverse user personas: Jessica, a busy mom seeking efficiency; Lisa, an empty nester valuing health and aesthetics; and Robert, a budget-conscious professional. Through surveys, interviews, and competitor audits, we uncover user frustrations and desires, from pantry management to social dynamics of grocery shopping. Our findings reveal a rich tapestry of user needs, leading to actionable design recommendations for AI-powered tools and enhanced grocery shopping features. The report emphasizes transparency, inclusivity, and adaptability, aiming to inspire innovation in meal planning for Meal Maven and beyond.

Harris Anthropological Research

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Contents

Executive Summary

Introduction and Background

This research report showcases John Harris' experience in UX research while pursuing Google's UX Design certificate. The project focuses on designing "Meal Maven," an app and responsive website for inventory management and meal planning based on available ingredients. The research aims to understand the target users of Meal Maven, their needs, and challenges, and to compare competitors' users and assess their strengths and weaknesses

Research Goals

- Forge Expertise in UX Research and Design: Embark on a journey to cultivate hands-on experience and sharpen skills in user experience research and design.
- Achieve Academic Distinction: Secure the prestigious credentials offered by completing Coursera's Google UX Design certificate, adding a significant feather to the professional cap.
- Decode the Food App Market: Delve into the intricacies of the food app landscape, identifying market gaps and gaining a deep understanding of the primary user groups, their needs, and challenges in executing meal planning activities.

Key Research Findings

- Who are the user groups for a comprehensive meal planning app?
    - Jessica: A busy working mom who seeks efficient, budget-friendly solutions. She prefers grocery pick-up to save time and needs a system that can track pantry items and suggest recipes based on available ingredients
    - Lisa: An empty nester who values health-conscious, aesthetically pleasing meals. She prefers to shop in-person for quality and value and seeks recipes that align with her health goals and dietary restrictions
    - Robert: A budget-conscious professional who prioritizes affordability and simplicity. He often shops in-store for the best deals and needs a straightforward way to find recipes that fit his dietary needs and available kitchen equipment
- What motivates each group, and what are their goals?
    - Jessica's chief motivations are to save time and reduce the mental load associated with meal planning. Her goals include finding quick, affordable, and food-sensitive options that accommodate her family's dietary restrictions and preferences
    - Lisa's chief motivations are to maintain her health and create memorable dining experiences. Her goals include finding novel, visually appealing, and healthy recipes that use seasonal produce from her garden
    - Robert's chief motivations are to manage his budget and maintain his health. His goals include finding affordable recipes that are easy to prepare and align with his dietary restrictions
- How do users collaborate, plan meals, and make shopping lists?
    - Jessica collaborates with her spouse to manage meal planning and grocery shopping. They often use shared apps and note-taking tools to coordinate their efforts. Jessica prefers to consolidate shopping and meal prepping to mostly once a week, relying on leftovers for lunches. She uses a mix of traditional and digital tools, including a chalkboard, notepad, smartphone photo album,

cookbooks, Pinterest, Google searches, grocery store order apps, restaurant apps, food delivery apps, and text message
    - Lisa collaborates with her spouse and occasionally with her children, incorporating family dynamics into the process. Lisa often shops as needed, often for the current day it is needed, and uses food apps primarily as a source of recipe inspiration. She enjoys the social aspect of grocery shopping and uses tools like cookbooks, YouTube, and Pinterest for visual inspiration
    - Robert often solo shops in-store for the best deals and collaborates with friends or neighbors to share ingredients and meal ideas if at all. Robert uses a variety of apps for grocery store coupons and rebate redemption purposes. He prefers minimalist shopping and same-day food prep, bulking up on food during mark-down days. Robert's meal planning is influenced by his health reasons and available cooking options and recipes when traveling for work
- What barriers and frustrations do users face in meal planning?
    - Jesscia's chief issues are the lack of consolidation in meal planning tools, which forces her to toggle between different apps for recipes, grocery lists, and pantry management. She also faces challenges with ingredient management, often forgetting what she has in stock, leading to overspending and food waste
    - Lisa's chief issues are the difficulty of navigating crowded stores and the mental burden of ensuring she has the right ingredients for her recipes. Lisa also struggles with the lack of visual and step-by-step instructions in traditional cookbooks, which makes meal planning more challenging. Additionally, she often feels overwhelmed by the need to avoid food waste and manage her pantry efficiently
    - Robert's chief barriers include managing his budget and finding affordable, simple recipes that fit his dietary needs and available kitchen equipment. His frustrations stem from the complexity of using multiple apps to track coupons, rebates, and deals, as well as the mental load of planning meals with limited resources. Robert also faces challenges with ingredient availability and quality, especially when traveling for work. He often feels bored with his meal rotation but finds it overwhelming to try new recipes due to the steep learning curve

Limitations

- Funding limitations consequently meant recruiting within one's social circle, which posed a significant bias of participants entirely comprised of individuals of Euro-American ancestry. This lack of diversity could lead to biases towards cultural food practices and social dynamics, such as family structures playing out in meal planning. Additionally, there was a geographic bias towards Texas participants, which could influence the results based on regional food preferences and availability.
- Subsequent visits to competitors apps/websites showed changes in reviews and functionality offerings than from the first time assessed, which can pose inconsistencies with findings due to the rate of their improvements.
- Many competitors were behind paywalls, and therefore went unassessed in the audit due to funding constraints.

Introduction and Background

Project Background

This research report demonstrates John Harris' experience in UX research while undertaking Google's UX Design certificate—a seven-part course that thrives on hands-on experience. The course not only hones the skills of budding UX designers but also ensures students curate a stellar portfolio to enhance employment prospects, even nudging them towards establishing their own portfolio website and personal branding.

In this project, the investigator (John Harris), keen on acquiring genuine UX research experience, deviates from certain prefabricated information typically used for UX design purposes. Instead, he pursues real UX research, surpassing the course's stated goals. Crafting this research plan itself is a practice in adhering to rigorous UX research procedures. It ensures consistency in selecting and applying methods to answer key questions, provides reflective justification for methodological choices, and evaluates whether the stated goals have been achieved.

The case study revolves around designing an app and a responsive website, "Meal Maven," aimed at consumers' inventory management and meal planning based on available ingredients. This research plan outlines the framework for exploratory research, focusing on exploratory investigations to understand core questions about the target users of Meal Maven, their needs, and challenges. Additionally, the project involves comparing competitors' users and assessing their strengths and weaknesses.

This phase of the project is dedicated to the results of the exploratory research, aiming to uncover fundamental insights about Meal Maven's potential users and their requirements. It includes a thorough analysis of competitors' offerings, helping to identify the strengths and weaknesses of existing solutions in the market.

By meticulously following this research plan, the investigator strives to ensure that Meal Maven not only addresses user needs but also stands out in a competitive landscape, providing a meaningful and engaging experience for its users. After some immediate user research, Meal Maven is anticipated to include the following key functionalities to create a comprehensive meal planning app.

- Planner
- Cookbook
- Recipe Browser
- Shopping List
- Pantry

Research Goals

The goals and needs of Harris Anthropological Research LCC:

- Forge **Expertise** in UX Research and Design: Embark on a journey to cultivate hands-on experience and sharpen skills in user experience research and design.
- Achieve Academic Distinction: Secure the **credentials** offered by completing Coursera's Google UX Design certificate, adding a significant feather to the professional cap.

- **Decode the Food App Market**: Delve into the intricacies of the food app landscape, identifying market gaps and gaining a deep understanding of the primary user groups, their needs, and challenges in executing meal planning activities.

Research Questions

User Groups and Demographics:

- What kinds of user groups are there for a pantry inventory + meal planning + research search + cookbook manager + shopping list generator + list export to a grocery store app shopping cart?
- Which group is the primary target user group?
- What are the primary demographics (age, gender, occupation) of users who actively use meal planning apps?
- How do these demographics influence their meal planning habits and preferences?

User Motivations and Goals:

- What motivates each group to use meal planning apps (e.g., time-saving, dietary needs, budget management)?
- What specific goals do users aim to achieve with meal planning apps (e.g., healthy eating, reducing food waste)?
- What are each user group's interests and goals when it comes to weekly planning routine?

User Collaboration and Planning:

- How do users collaborate with family members or roommates in meal planning and grocery shopping?
- What tools or methods do they use for collaboration (e.g., shared lists, calendar apps)?
- How do users coordinate or communicate the menu, or meal plan for the week with others, if applicable?

Barriers and Frustrations:

- What are the top three barriers users face when using meal planning apps?
- How do these barriers impact their overall meal planning experience?
- What stressors or moments of frustration arise during users' meal planning routines?

Feature Effectiveness:

- Which features do users find most helpful in meal planning apps (e.g., recipe suggestions, grocery list generation)?
- How effective are these features in meeting users' meal planning needs?
- What tools do users use in meal planning (e.g., calendar, app, chalkboard, notepad)?

Competitor Analysis:

- How does "Meal Maven" compare to its top three competitors in terms of user satisfaction and feature set?
- What unique features or benefits does "Meal Maven" offer that competitors do not?
- What kinds of food-related apps do users currently use, or why not?

Unmet Needs and Market Gaps:

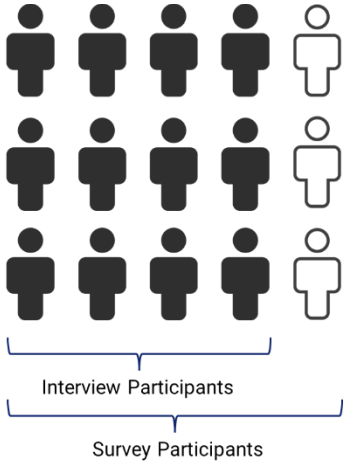
- What are the top two unmet needs or gaps in the current meal planning app market?
- How can "Meal Maven" address these unmet needs to provide a better user experience?
- What barriers or unseen needs do these user groups experience in their meal planning routines and resources, especially which obstacles deter otherwise potential food-related app users from being these app users in the first place?

Survey Findings

I've organized the survey results an assessment of participant screening for study suitability and incipient insights into participant's meal preparation behavior, which will be built on in the interview. Meal prep behavior in participants, even if not selected for the interview or testing studies, likewise offered insights into their habits and some clarity on their meal planning decisions. A note of definition, the ages were aggregated into generations for comparability. Since there are different year ranges, I used one of the Pew Survey (Park 2023) study's year ranges: Millennials are between 28-43; Gen X are between 44-59; Baby Boomers are between 60-78; and Silents are 79+.

Participant Screening Results:

Figure 1. The 15 Participants

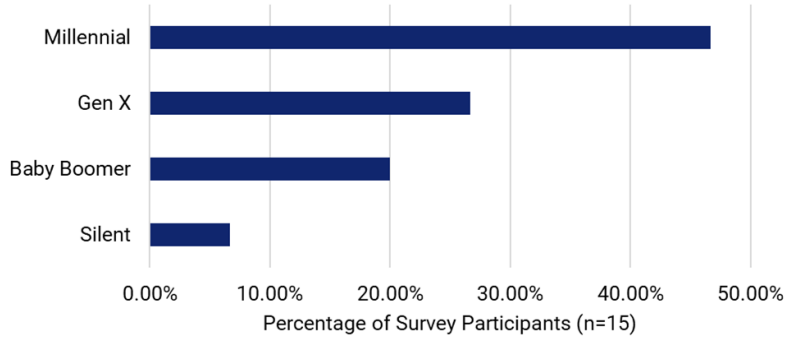


Most (80%) of the research participants reached were suitable for further study moving forward.

The survey succeeded in targeting Millennial and Gen X families with children at home and a good mix of the gender. These are college to graduate school educated participants ranging from couples to singles with pets but no kids living at home, or families with pets and kids living at home. Occupational backgrounds were fairly spread, with a little bit of a lead by those in the government sector. Some insights were even gleaned by those screened out from the study.

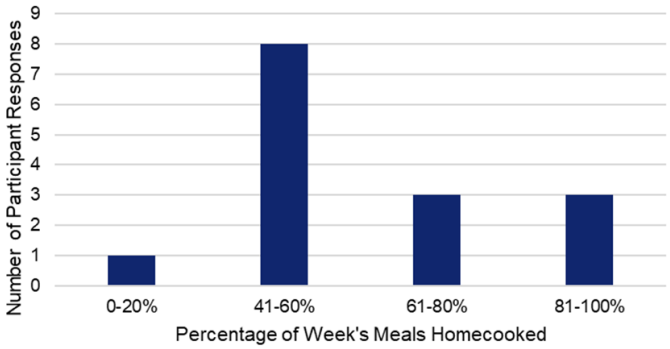
Unfortunately, some biases were noted such as participants' ancestral affiliation were completely comprised of individuals with Euro-American ancestry and there was some geographic bias towards Texas. This is expected to produce some biases towards cultural food practices and social dynamics like family structures playing out in meal planning roles, which could all differ if the sampling were more racially diverse or diversified ancestral affiliation. But these are a consequence of using social circle recruits for educational purposes.

Figure 2. Generations of Survey Participants



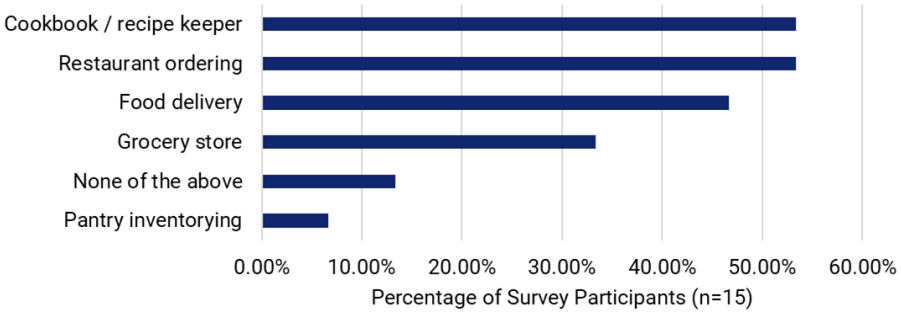
Meal Prep Behavior Results:

Figure 3. Percentage of Weekly Homecooked Meals



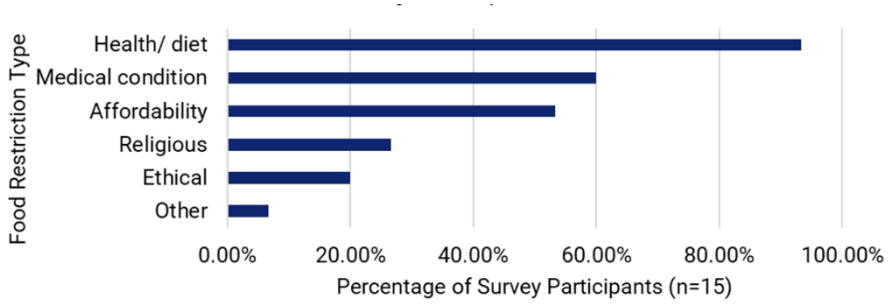
Most participants' weekly meals are mostly all homecooked and they personally are apart of the meal planning process, ensuring these participants offer relevant perspectives into their meal planning habits and should offer good user group potential for a meal planning app. This might suggest that complex dietary needs or the desire to save money may be important drivers to meal planning behavior.

Figure 4. Prevalence of Food App Uses Among Survey Participants



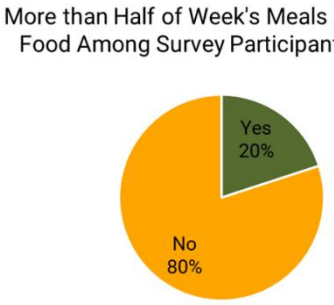
More than half of participants use a cookbook / recipe keeper app, while the other two most salient food apps are for ordering take-out at restaurants or restaurant food delivery. This may suggests participants may wrestle with retaining the efforts of knowing what to cook due to their complex dietary needs, and the ability to get food on-demand or time is highly valued by participants.

Figure 5. Food Restrictions as a Meal Planning Factor Among Survey Participants



The most important factor in choosing meals during meal planning is around making general healthy choices or following a diet. Two other salient factors were due to planning around certain medical needs and affordability.

Figure 6. Ethnic Food Consumption Among Survey Participants

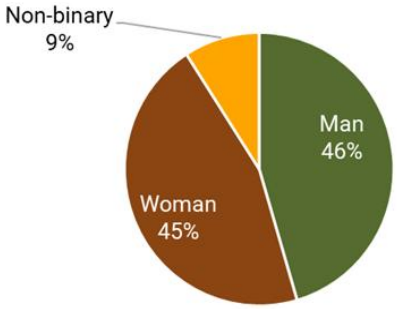


Variety of ethnic dishes was not a high meal planning factor, 80% of participants make Americana/American fare meals during the week; though, this could be due to the ancestral affiliation bias.

Interview Findings

A total of 10 participants were selected for interviews from the previously screened individuals who participated in the survey, 4 are men, 4 are women, and 1 is non-binary in gender. Maintaining a gender divide among participants and aiming to prevent some biases from skewing perspectives and reflecting the gender proportions in the survey as well. These participants prioritized individual's participation with the more different food app functionalities they use, to ensure familiarity with and valued insights in a comprehensive meal planning app with multiple functionalities. All interview participants gave consent for recording and for participation. The results discussion that follows is from the perspective of all the participants as a whole and does not reflect user groups (personas) until the sub-chapter on Personas.

Figure 7. Gender of Interview Participants

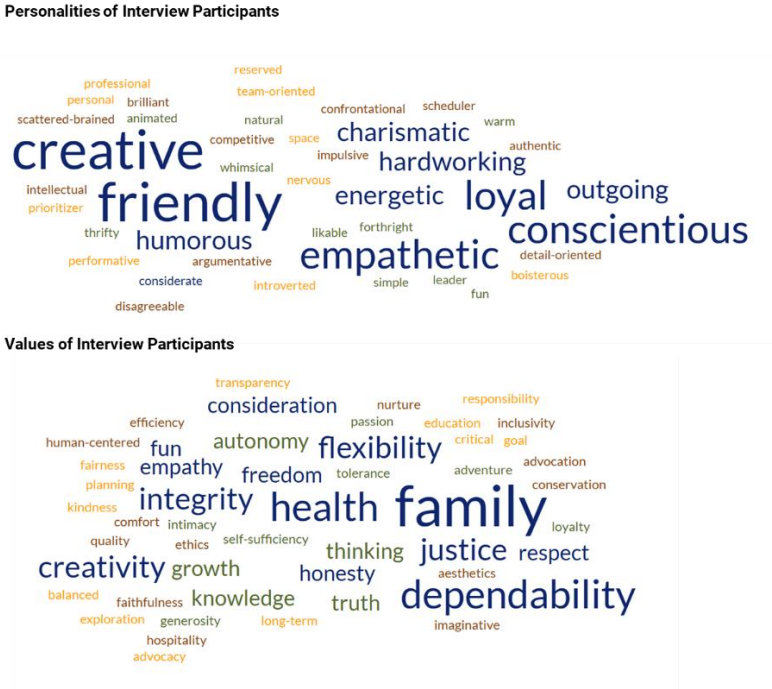


Interview Themes by Question

Personalities of and Personal Values of the Interview Participants

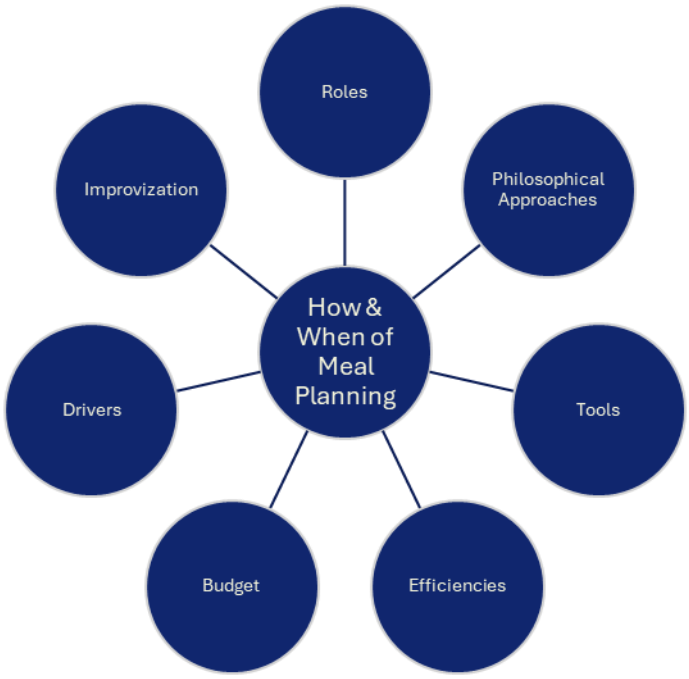
Nothing over half the participants shared the same personality trait, the highest shared personality traits were creative and friendly (4 out of 10). This suggests the spread of personalities of participants were fairly diverse. The only value shared by more than half (6 out of 10) was the value of family, the next two closest (4 out of 10) were health and dependability.

Figure 8. Word Clouds of Personalities and Values of Participants



Themes of How and When Meal Planning Occurs

Figure 9. Themes of How and When of Meal Planning



Collaboration & Roles in Meal Planning:

- Clear division of labor exists in many households: one partner often assumes primary responsibility for grocery shopping and planning, while the other assists as needed.
- Collaborative decision-making occurs, such as checking cravings with partners or tailoring school lunches to children's preferences. Technology, like shared apps and note-taking, supports this teamwork.
- Shopping and meal prep are seen as an opportunity for family bonding, such as co-shopping trips or traditions like chalkboard lists shared between spouses.

Philosophical Approaches:

- Many participants adjust their plans based on changing circumstances, such as craving shifts, midweek ingredient shortages, or unexpected events.
- Some participants take a minimalist and reactive approach, focusing on staples that allow for flexible, mix-and-match meals. This includes leveraging leftovers, shopping only for the day's needs, or making meals around ingredients close to expiration.
- Others find joy in exploring creativity and variety, treating food as a source of inspiration, learning, and personal expression.
- Others find some form of bulk meal preparation the best way to prepare for everyone's needs.

Planning Tools & Techniques:

- Tools like chalkboards, phone apps, HEB/Walmart apps, and lists are central to organizing shopping and meal prep.
- Visual inspiration, such as cookbooks, YouTube, or Pinterest, plays a significant role in recipe selection. Some participants also seek sensory cues, like smells or colors, to guide meal ideas.
- Systems for efficiency, such as organizing errands, shopping circuits, and bulk prepping, ensure smooth planning and shopping routines.

Effort Optimization:

- Participants often aim to streamline meal planning to minimize time and effort. Examples include quick and easy meals, pre-portioned batches, and efficient use of ingredients on hand.
- Proactive measures include bulk meal prepping (e.g., freezing large batches), soaking beans overnight, or scheduling meals based on freshness cycles (e.g., grocery stock updates).

Financial Considerations:

- Economical shopping is a recurring theme, with participants prioritizing deals, coupons, or discounts to manage budgets.
- Strategies like food banks, employee discounts, and stocking up on sale items help navigate resource constraints.

Cultural, Sensory, & Experiential Drivers:

- Meal planning can transcend practicality; some participants emphasize creating meaningful experiences through meals, such as invoking memories, offering hospitality, or impressing guests.
- Preferences for sensory-rich meals (e.g., appealing smells, vibrant colors, enticing textures) influence ingredient choices and cooking styles.
- Diverse cuisines, from Asian recipes to spice blends at The World Market, highlight the inspiration drawn from cultural exploration.

Challenges & Workarounds:

- Limited time, fatigue, or lack of motivation to cook influences decisions like relying on takeout, simple go-to meals, or reactive planning.
- Some participants experience a shift in responsibilities or decreased ability to plan extensively due to life changes like returning to school or changes in family dynamics.
- Unexpected shortages or ingredient expiration frequently require improvisation or midweek shopping.

Themes of What is Meal Planned

Figure 10. Themes of What Gets Planned

Dietary Preferences & Nutrition:

- Participants prioritize specific diets, including low-carb, gluten-free, diabetic-friendly, or high-protein regimens.
- Focus on health-conscious foods such as salads, fresh veggies, smoked meats, salmon, and smoothies made with protein powder and almond milk.
- Food choices are guided by dietary restrictions (e.g., less dairy, tofu instead of meat) or specific health goals like avoiding sugar and preservatives.

Ingredient Use & Sustainability:

- Efforts to maximize ingredient usage include saving leftovers (e.g., using rotisserie chicken bones for broth) and repurposing ingredients (e.g., leftover salmon for salads).
- Some participants practice food sustainability, such as freeze-drying game meat, hunting, gardening (hydroponic or traditional), and making homemade dog food.
- Staples like beans, rice, and frozen vegetables are stocked for dependability, often tied to experiences of shortages during COVID.

Cultural & Social Influences:

- Celebrations and traditions shape meal planning, like Shabbat dinners, holiday-specific recipes, or meals with religious dietary restrictions (e.g., Passover).
- Meal planning is inclusive when hosting or considering others' preferences, such as accommodating picky eaters, vegans, or gluten-free guests.

Convenience & Efficiency:

- Reactive approaches to planning are common, with reliance on staples for mix-and-match flexibility or quick meals based on the day's needs.
- Prepping in bulk (e.g., smoked meats, soups) and freezing leftovers helps streamline cooking during busy weeks.
- Quick meal solutions include stir-fry kits, tacos, or fly-by dinners like Whataburger due to time constraints.

Financial Considerations:

- Affordability drives decisions, with a focus on shared or versatile ingredients to avoid waste.

- Cost-saving habits include buying in bulk, utilizing employee discounts, avoiding food delivery fees, and selecting economical staples.

Inspiration & Aesthetics:

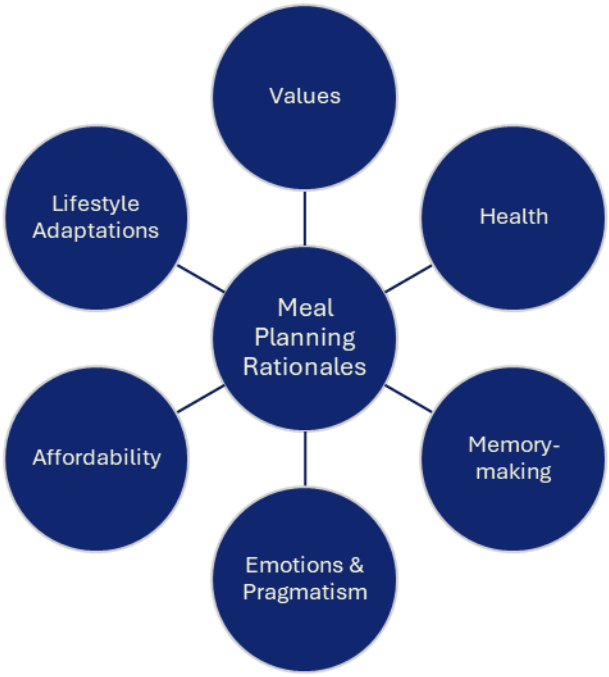
- Participants seek inspiration from online platforms (Pinterest, YouTube), cookbooks, and markets to explore new recipes or variations of familiar dishes.
- Sensory appeal, such as visual presentation or appealing smells, plays a role in recipe selection.

Emotional & Practical Realities:

- Some participants express frustration or boredom with routine meals but value reliable meal options that reduce decision fatigue.
- Cooking is seen as both a necessity and a source of joy, with varying levels of motivation influencing the extent of planning and preparation.

The Themes of Why Meal Planning Occurs The Way it Does

Figure 11. Meal Planning Rationale



Value-Driven Decisions

- Community Support: Some choose clerk checkouts instead of self-checkouts to support local employment and the economy. For example, purchasing from businesses like HEB, which demonstrates loyalty to Texas communities, or buying from veteran-owned and American-made brands (e.g., Black Out Coffee), reflects values of community impact and alignment with shared principles.
- Self-Sufficiency: Meal planning reflects deeper values like food sovereignty and autonomy. Growing their own produce ensures organic quality and sustainability while reducing dependence on external systems. For one, this is a personal and political act—a way to resist systems of control while ensuring food security.
- Flexibility and Efficiency: Many emphasize meal plans that offer adaptability (e.g., overlapping ingredients or rotating staples) to handle unexpected stock issues or changes in preferences.
- Quality of Life: Meal planning is viewed as a critical contributor to health, minimizing pain or inflammation through diets tailored to personal needs.

Health and Nutrition

- Dietary Needs: Extreme dietary restrictions or medical conditions, like diabetes or inflammation, shape careful planning of meals that avoid trigger ingredients or focus on fresh, wholesome foods.
- Natural and Organic: Planning revolves around knowing the origins of food—whether through gardening or buying locally—and avoiding chemicals or unhealthy preservatives. This is motivated by a desire to live healthier, longer lives for family, like grandchildren.
- Efficiency Without Sacrificing Health: Participants gravitate toward recipes that are quick, involve few ingredients, and are minimally complex (e.g., one-pot meals) while still aligning with health goals.

Personal Experiences and Memories

- Cultural and Family Traditions: Early experiences, such as accompanying a grandmother to ethnic delis or learning resourcefulness during childhood poverty, inform how participants approach planning today. There's a sense of carrying forward meaningful culinary practices.
- Creating Memories Through Food: Meal planning also supports making meals that are sensory-rich and memorable, with participants often motivated by the social and emotional significance of meals shared with family or guests.

Emotional and Practical Realities

- Routines and Comfort: Some rely on predictable meal routines, even if it becomes monotonous, because it provides stability and reduces decision fatigue. Others are motivated by the comfort of surplus food as a buffer against uncertainties, stemming from experiences of scarcity or financial challenges.
- Therapeutic Elements of Shopping and Planning: For one participant, grocery shopping became a form of therapy during the pandemic—an opportunity for brief social interaction, a sense of accomplishment, and spiritual and emotional healing.
- Time as a Resource: Participants balance cutting corners with meal prep and planning to save time while still maintaining quality meals. For some, planning sacrifices the "present for the future," making efficiency and routine essential.

Resourcefulness and Affordability

- Cost-Consciousness: Scarcity mindsets from past experiences drive frugal planning, like doubling up on items during discounts or seeking flexibility to minimize food waste. Bargains and sales bring excitement and make planning more affordable.
- Resourceful Cooking: Utilizing leftovers, minimizing waste, and relying on foundational foods or staples (e.g., potatoes, beans, tomatoes) are common strategies to stretch resources effectively.
- Adaptability in Tight Situations: Participants are resourceful in remote or limited-resource areas, such as working with whatever is available, like canned goods from a gas station or garden produce.

Practical and Lifestyle Adaptations

- Simplifying Life: Meal planning is guided by a desire to "get on with life" rather than fuss over complex preparations. Participants favor simple, repeatable methods to free up time for other activities like learning or spending time with loved ones.

- Reactive and Flexible Planning: Those who embrace a reactive approach prioritize ingredients that can pivot into different meals based on availability or changing preferences, ensuring flexibility to handle unexpected disruptions.

The Themes of Where Meal Planning Activities Occur

Figure 12. Meal Planning Places

Preferred Grocery Shopping Locations

National and Large Retailers:

- Costco: Frequently used for bulk items like half-and-half, diapers, or wipes. Its proximity to home is a common convenience factor, but its relevance may diminish for some as family needs (e.g., diaper use) evolve.
- Walmart: Utilized for non-food essentials, geographically convenient "impromptu needs" (e.g., trash bags, last-minute items), and in some cases, workplace proximity. However, preferences for other stores with value-driven missions, like HEB, may make Walmart less desirable for major grocery shopping.
- Kroger Group (e.g., Fred-Mayer, Safeway): Favored for deals like clearance meats, repackaged eggs, and reduced-price items. Inventory rotations on specific days (e.g., Wednesdays and Thursdays) influence shopping routines for maximizing discounts.

Local and Regional Stores:

- HEB: A strong favorite due to its alignment with community values and local loyalty. Participants feel good about shopping here, despite higher prices, because it supports Texas communities. HEB is commonly visited for both in-store experiences and pre-cooked meals if it aligns with travel routes.
- Sprouts: Valued for its specialty health food selection, which complements other shopping at HEB.
- Albertsons: Used for fresh vegetables and as part of broader shopping circuits.

Specialty and Niche Stores:

- Aldi/Trader Joe's: Known for gluten-free options, unusual finds, and good produce. Shoppers appreciate the sense of discovery and affordability.
- Farmer's Markets: Highlighted for fresh, local produce, organic goods (e.g., tea, honey, grain-fed beef), and the opportunity to connect with growers. Smaller markets are seen as quick and budget-conscious visits, though options in some areas may feel limited.

- Ethnic Stores and National Food Sections: These are important for finding culturally specific ingredients or items that meet diverse culinary needs.

Shopping Circuits and Geographic Considerations

- Many participants plan their trips based on geographic convenience and traffic patterns. For example, they may start at a distant store like Winco and work their way back home, hitting stores along the route. Avoiding congested areas (e.g., bridges) plays a significant role in scheduling and frequency of trips.
- Farmers' markets, HEB, and other preferred stores are often selected if they align with other errands or routes.

Shopping Experiences and Motivations

In-Store Interactions:

- Participants often prefer in-store shopping to delivery or pickup services due to the social connections it fosters. Regular interactions with clerks, familiar faces, and even opportunities to meet new people contribute to a fulfilling shopping experience.
- The sensory aspects of shopping (e.g., seeing fresh produce, discovering new items) are often cited as enjoyable, especially for families introducing children to grocery shopping.

Practicality and Routine:

- Shopping habits often focus on balancing affordability, health-conscious choices, and efficient routines. This includes tracking store discounts or inventory schedules and buying in bulk to save time and money.
- Proximity to home or workplace is a deciding factor for grocery store selection, particularly for stores like Kroger and HEB.

Challenges and Adjustments

- Traffic and Time Efficiency: Traffic congestion and store accessibility heavily influence frequency and timing. For some, this means fewer trips and careful planning of store circuits.
- Balancing Convenience and Values: While some stores like Walmart offer convenience, many participants prioritize shopping at places like HEB or local markets that align with their values of supporting community and ethical practices.

Collaborative in Meal Planning

Partner Collaboration:

- Many interviewees plan meals collaboratively with their spouses or partners, often with the partner playing a key role as the primary shopper or cook.
- Collaboration may include shopping together on weekends, which is often seen as a social activity unless time constraints require splitting tasks.
- Some participants actively check in with their partners for input on planning or to confirm last-minute decisions.

Family Involvement:

- A few participants plan meals with both their spouse and children, incorporating family dynamics into the process.

- Children's preferences and needs (e.g., school lunches or snacks) are factored into meal decisions.

Solo Planning:

- Several interviewees take responsibility for meal planning entirely on their own, handling both planning and execution without external input.

Occasional Collaboration with Others:

- In some cases, neighbors or friends are briefly involved in meal planning, such as borrowing ingredients or sharing meal ideas for gatherings.

Weekly Time Spent on Meal Planning Activities

Range of Time:

- Time spent on meal planning activities varies widely, from as little as 5 minutes to as much as 6-12 hours per week.
- This variability reflects major differences in approaches to meal planning among different user groups.

Average Time:

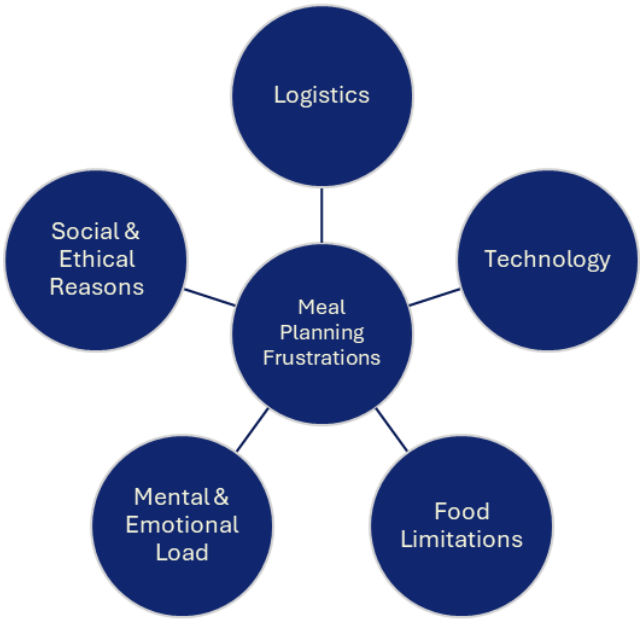
- The combined data suggests an approximate average of 4.3-5.5 hours per week when considering all responses.
- A further caveat to this average is that the perception of how much time this feels like to users will depend on their user groups as we will see in the personas sub-chapter.

Key Observations:

- Those with higher time investments likely include meal prepping, cooking, and accommodating dietary needs or larger households.
- Minimal time investments may indicate a more reactive or simplified approach to planning.
- Time spent varies depending on individual routines, resources, and the extent of meal preparation included.

Frustrations in Meal Planning

Figure 13. Meal Planning Frustrations



Logistical Challenges

- Traffic and Store Crowding: Navigating congestion, traffic, and crowded stores is a frequent frustration. Many avoid peak hours by shopping earlier or later but still find these challenges time-consuming and stressful.
- Multiple Store Visits: Having to go to multiple stores to find specific ingredients, especially when a primary store like HEB runs out, adds inconvenience. This is compounded by regional availability issues (e.g., lack of health food stores in some areas).
- Unanticipated Costs: Managing budgets across different categories (e.g., groceries, subscriptions) is stressful, with unexpected expenses complicating planning.

Technology-Related Frustrations /Distrust in Technology:

- Tech-averse participants avoid pantry inventory apps and grocery pick-up services because they prefer to personally ensure the quality of produce (freshness, ripeness).
- Issues like inaccurate auto-dictation or lack of technical proficiency create barriers to leveraging tools like recipe and grocery apps.

Inefficient Apps and Features:

- Participants are annoyed by tedious recipe apps like Pinterest, where ads, irrelevant content, and lengthy narratives obscure the ingredients or instructions. Switching between apps (e.g., Pinterest and HEB) creates further inefficiencies.
- Grocery apps that don't store commonly ordered items or involve confusing item sizes (e.g., oversized bags of corn) add to the frustration.

Food-Related Limitations Ingredient Availability and Quality:

- Seasonal or regional limitations (e.g., avocados, tomatillos) and global standardization of big-box store inventories frustrate those who value unique, local products.
- Concerns about food labels (e.g., sustainability, hidden ingredients like canola oil) require time-consuming research to avoid undesired additives, posing a mental burden.

Food Waste:

- Frustration arises from wasting food due to spoilage caused by changing plans, lack of follow-through, or unexpected events. Participants wish recipes incorporated longer-lasting or more preservable ingredients.

Mental and Emotional Load Planning Fatigue:

- Participants find meal planning mentally taxing, especially when tracking pantry inventory, deciding on meals, and ensuring all family needs (dietary, cultural, age-related) are met.
- Overwhelming choices, boredom from repetitive meals, and new recipe learning curves contribute to the burden.

Cultural Disappointments:

- Cultural ignorance in cooking videos and standardization in grocery stores are seen as detrimental to authentic and diverse food experiences.

Stress Over Failures:

- Fear of failed recipes, incorrect substitutions, or poor-quality ingredients undermines the enjoyment of cooking.

Social and Ethical Considerations

Community and Relationships:

- Some lament the loss of social connection during grocery delivery or app-based shopping. Brief interactions with clerks or in-store connections are seen as valuable.

Sustainability Concerns:

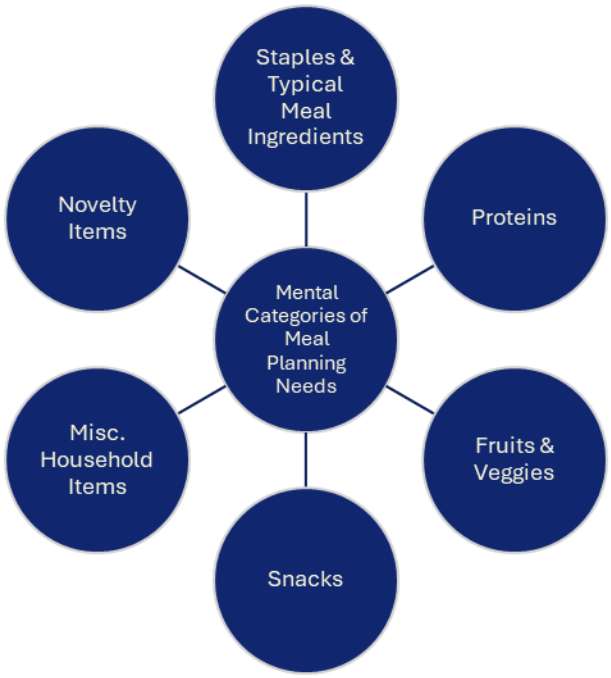
- Ethical worries about the food system, sustainability labels, and the homogenizing effects of corporate grocery chains add another layer of frustration.

Key Insights

Participants' frustrations are a mix of practical hurdles, technological inefficiencies, and broader social or ethical concerns. While many of these challenges are logistical (e.g., navigating traffic, managing apps), others reflect deeper frustrations with food systems, cultural homogenization, and the mental load of balancing family and personal needs. These barriers often undermine the convenience and enjoyment of meal planning.

Key "Buckets" or Mental Categories in Meal Planning Needs

Figure 14. Mental Categories of Meal Planning Needs



Staples:

- Core pantry and fridge essentials used across multiple meals.
- Examples: Greens, onions, eggs, chicken, fish, quinoa, rice, corn, gluten-free bread, coconut milk, oils (e.g., coconut oil, olive oil, ghee), and beans.
- Ingredients tailored for popular weekly dishes.
- Examples: Pizza ingredients, taco ingredients, toast toppings, condiments, and ingredients for lunches and dinners.
-

Proteins:

- Regular sources of meat, alternative proteins, and dairy.
- Examples: Chicken, fish, meats (e.g., savory proteins for cooking), lactose-free and gluten-free options, binders like corn or gluten-free flour, sheep or goat milk cheese and yogurt.

Fruits and Vegetables:

- Fresh produce prioritized for health and meal diversity.
- Examples: Avocados, fruits, veggies, and specialty items like cherry smoothie ingredients.

Snacks and Sweets:

- Items specifically planned for enjoyment or catering to individual preferences.
- Examples: Chocolate-covered almonds, popcorn, favorite treats, or occasional indulgences like strawberry cookies and chips with dip.

Miscellaneous Household Items:

- Non-food essentials often purchased alongside groceries.
- Examples: Pet food, laundry items, paper products (e.g., TP), counter spray, and light bulbs.

Novelty Items:

- A small category of new or "exciting" purchases to add variety.
- Examples: A "crazy/novel thing" as a treat or experiment if the budget allows.

Common Practices and Considerations

Family-Centric Planning:

- Snacks and items are often categorized based on the preferences of specific family members (e.g., snacks for partners or children).

  Occasion-Based Additions:

- Special occasion or pay-day budgeting can prompt purchases for treats like ice cream or cookies for tea.

  Writing and Visualizing Needs:

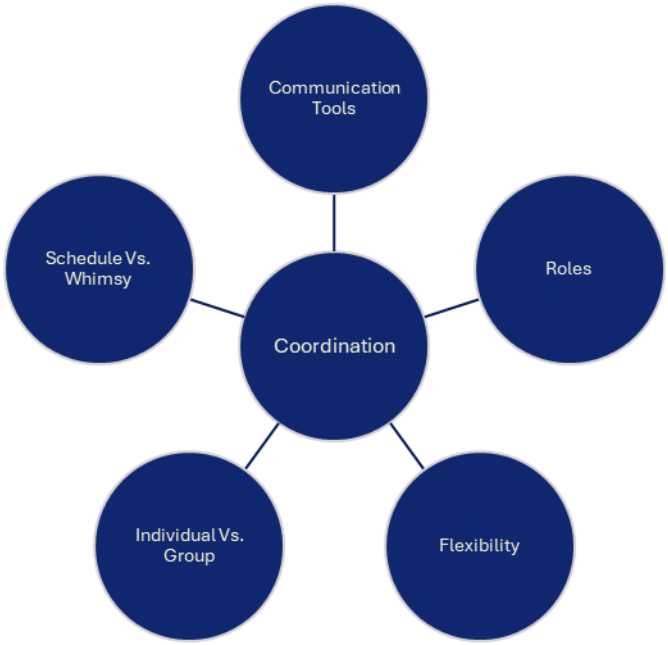
- Some participants note items on chalkboards or physical lists for clarity and ease, avoiding reliance on complex apps.

Summary:

Meal planning revolves around a flexible categorization system that includes staples, proteins, produce, snacks, sweets, household essentials, and occasional novelty items. These "buckets" ensure that necessities are covered while allowing room for indulgence and personalization.

Coordinating Meal Planning

Figure 15. Coordinating Meal Planning



Primary Communication Tools:

- Chalkboards and Visual Notes: Commonly used to pool shopping list items, which are later photographed for reference. These lists serve as a central means of coordination between partners.
- Apps and Texting: Some participants use note apps to share plans or text links for recipes and ingredient updates with their partners.

Shared Roles and Responsibilities:

- Meal planning often involves collaboration, with one partner typically responsible for the majority of the planning and cooking while the other contributes to specific meals (e.g., Shabbat dinners or favorite dishes).
- Coordination between partners depends on factors like work schedules and availability, with discussions revolving around "what, when, and who" will prepare meals.

Flexibility and Adaptation:

- Partners communicate about schedule shifts (e.g., early or late work meetings) to adjust meal plans. For instance, meals might be timed earlier in the week if ingredients risk spoiling.

- When errands arise, such as mid-week shopping or unexpected outings, partners discuss updates to lists or plans.

Individual Vs. Group Meal Planning Approaches

Solo Planning:

- Several participants independently handle all aspects of planning, cooking, and shopping without additional input from family or friends.
- Individual planning may involve solo shopping trips during off-peak traffic hours or a personal preference for handling tasks independently.

Community and Social Interaction:

- In some cases, meal planning and shopping involve broader social connections, such as including neighbors for shared cooking and waste reduction. Activities like darts or dominos during meal prep encourage social engagement.

Planning and Coordination Methods

Weekly Scheduling:

- Weekly plans often live in participants' heads, on chalkboards, or within notes apps, typically organized into a Monday-to-Sunday structure.
- Factors such as holidays, special occasions, or perishable ingredients determine what is cooked and when.

Inspiration and Strategy:

- Participants frequently use recipe sources such as Pinterest, Google, or cookbooks for inspiration. Some employ more structured approaches, like strategy maps, to filter recipes based on available ingredients.

Preference Management:

- Meal coordination often takes family dietary needs, preferences, and convenience into account. For example:
- A partner focused on convenience might prioritize one-pot meals or take-out.
- Another may enjoy shopping for international cuisine or trying new dishes.

Summary

Meal planning communication spans a variety of tools and methods, with chalkboards and apps forming the backbone of partner coordination. Collaboration ranges from fully shared efforts to solo planning, with flexibility central to adapting plans around schedules and ingredient availability. For some, these interactions extend beyond the household, fostering connections with neighbors and community members.

Tools of Meal Planning

Digital Tools

Apps for Meal Planning, Shopping, and Coupons:

- Grocery Store Apps: HEB, Publix, Walmart, Kroger (used as a shopping list, not for orders for those who only in-store shop).
- Coupon and Price Checking Features: Integrated into grocery apps for deals and specials.
- Delivery and Subscription Services: DoorDash, Hello Fresh.

Digital Note-Taking and Sharing:

- Notes Apps: iPhone Notes, Android Notes.
- Texts and Emails: Used for sharing recipes, ingredient lists, and coordinating plans.

Inspiration Platforms:

- Recipe Websites and Apps: Pinterest, Google search, Bon Appétit.
- Social Media: TikTok, Instagram.
- Video Platforms: YouTube (both instructional and inspirational content).

Physical Tools

Traditional Note-Taking:

- Notepad and pen/pencil for jotting down grocery lists or plans.
- Chalkboards frequently used to create and organize shopping lists, often photographed for reference.

Cookbooks:

- Used for both tried-and-true recipes and as a source of inspiration (with some participants favoring cookbooks for their readability, such as large print options).

Miscellaneous Tools

Cameras:

- iPhone or Android camera apps to photograph chalkboards or capture written lists for convenience.

Coupon Collectors:

- Physical or digital methods for organizing and redeeming discounts.

Amazon:

- Used for ordering non-food essentials related to meal planning (e.g., dog supplies).

Summary

Participants rely on a mix of digital and physical tools to manage meal planning. Digital apps and platforms provide convenience, inspiration, and cost-saving opportunities, while traditional tools like chalkboards, notepads, and cookbooks offer a tactile, reliable approach. Combining these tools helps interviewees stay organized, coordinate plans, and find inspiration within their unique preferences and routines.

Themes On Reasons For Eating Non-Home Cooked Meals

Figure 16. Eating Out Rationales

Time Constraints and Convenience:

- Feeling too tired to cook or clean up, especially after a long day or unexpected events, prompts eating out.
- Travel-related situations, such as being on the road, at conferences, or out of town, often necessitate dining out.
- Busy weeks or tight schedules where meal plans fail, ingredients aren't available, or grocery trips were missed lead to eating out as a fallback.

Special Occasions and Social Situations:

- Celebrations like holidays, anniversaries, and birthdays are common triggers for eating out.
- Social invitations, like breakfast or coffee after church, are sometimes accepted to avoid appearing socially awkward.
- Dining with friends (e.g., weekly Mexican outings) or coworkers is another motivation, often rooted in fostering connections.

Practical Needs or Failures in Meal Planning:

- When specific cravings arise, or there's a failure of self-control in sticking to plans, eating out provides a quick fix.
- Unavailability of key ingredients or issues in their "food cycle" (e.g., food waste, poor planning) may push individuals to eat out instead.

Dietary or Nutritional Considerations:

- Sometimes, eating out is motivated by the need for quick, flavorful, or protein-rich meals, particularly in cases of sugar emergencies or dietary preferences.
- Participants avoid fast or processed foods, preferring options that align with their health-conscious habits, like low-carb or flavorful, wholesome meals.

Economic and Quality Considerations:

- Rising costs and dissatisfaction with restaurant meals (e.g., feeling they could make it cheaper and healthier at home) have reduced the frequency of eating out.
- However, food delivery services like DoorDash or occasional takeout (e.g., Thai) are still considered when convenience outweighs cost concerns.

Emotional and Attitudinal Factors

- Guilt or Regret: Some participants reflect on how they could have saved money or eaten healthier by cooking at home instead.

- Cultural or Sensory Expectations: Eating out is sometimes justified when the food is perceived as flavorful, soulful, or offering a break from routine meals.
- Necessity and Lack of Options: Dining out occasionally feels unavoidable, especially during travel or events when packing food isn't sufficient.

Summary

Decisions to eat out often arise from practical needs like time constraints, convenience, or social events, balanced by considerations of health, cost, and dietary preferences. While some participants appreciate the flavor and ease of dining out, others express a preference for cooking at home due to the control it offers over quality and cost, reserving eating out for special occasions or unavoidable circumstances.

Why Interviewees Choose Not to Use Apps for Meal Planning

Figure 17. Meal Planning App. Avoidance Rationales

Distrust of Technology

Concerns About Privacy and Security:

- Apps like Jow raised concerns due to requests for sensitive financial information without clarity on their processes, leading to mistrust.
- Distrust in grocery pick-up apps is common, as participants feel pickers lack care in selecting quality produce, properly checking labels, or applying discounts.

Lack of Control and Transparency:

- Some participants feel that relying on apps reduces their ability to ensure the quality and freshness of ingredients.
- Sale prices and deals often require in-person shopping (e.g., QR codes or discount stickers), which apps can't replicate.

Philosophical and Personal Perspectives

Preference for Self-Reliance:

- Many feel that using apps creates laziness, diminishes vitality, and fosters over-reliance on technology. Participants worry about losing skills and independence if they outsource tasks to apps.
- Self-reliance is seen as more satisfying and meaningful, providing a sense of accomplishment and better engagement with the world.

Resistance to Change:

- Rapid technological shifts feel overwhelming, with some lamenting the loss of surprise, anticipation, and authentic human connection in a tech-driven world.
- The idea of relying on apps is viewed as contrary to their values of staying grounded, connected, and alive to the moment.

Practical Barriers

Complexity and Inefficiency:

- Learning and using apps can be too time-consuming or confusing. For instance:
- Issues with platforms like AllRecipes being overwhelming or not tailored to specific needs.
- Apps like EMeals or Jamie Oliver offering recipes with inaccessible ingredients or no alternatives.
- Some feel apps like Publix are too restrictive, only working inside one store.

Minimalist Alternatives:

- Many participants manage their meal planning mentally or prefer simple tools like physical lists or cookbooks. They feel these methods are more efficient and intuitive than digital solutions.

Specific Preferences

Preference for In-Person Shopping:

- Participants value the experience of shopping in-store for the ability to choose better quality items, find special deals, and enjoy social interaction.

Limited Adoption of Apps:

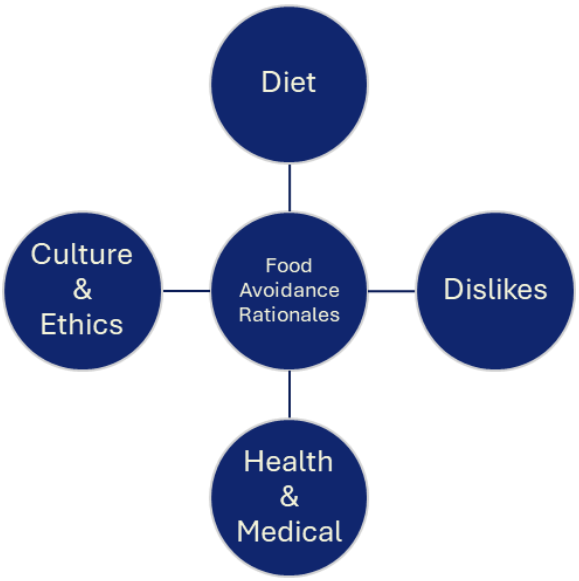
- Some are slow adopters of food apps and feel that the time and effort to learn them exceed the benefit. Others use apps sparingly (e.g., for restaurant ordering or store discounts) but reject them for broader meal planning tasks.

Summary

The reluctance to use meal planning apps stems from a mix of philosophical, practical, and trust-related concerns. Participants value self-reliance, transparency, and the tactile, human elements of shopping and planning that apps cannot replace. While some are open to selective app use, the majority prefer traditional methods, emphasizing control, simplicity, and authenticity.

Common Food Aversions and Restrictions

Figure 18. Food Avoidance Rationales



Dietary Restrictions:

- Gluten-Free: Avoidance of wheat, gluten, and related products.
- Dairy-Free: Exclusion of milk-based items like cheese, cream, or yogurt.
- Low-Carb/Low-Sugar: Minimizing carbohydrates, sugars, and high-carb items like starches.
- Religious proscriptions: Shellfish and pork are avoided by some, with mentions of aversions to food with blood as an ingredient.

Dislikes include:

- Blue cheese, green mold, pine nuts, walnuts, pecans.
- Creamy foods like casseroles or soups.
- Foods with particular textures, such as cottage cheese
- Off putting odors and tastes of fermented foods like kombucha.
- Strong preferences for fresh, unprocessed options over items containing additives like canola oil or carrageenan.

Health-seeking and Medical Avoidance Behavior:

- A significant aversion to highly processed foods, especially items with unrecognizable ingredients or excessive preservatives and chemicals. Foods with artificial or complex ingredients (e.g., corn syrup, sugar, alcohol) are widely avoided.

  Common allergens such as tree nuts, peanuts, wheat, and dairy are notable restrictions.

  Meat and Seafood Preferences: Concerns about growth hormones in meat (e.g., red meat, chicken) and specific aversions to certain types of seafood (e.g., shrimp, oysters, salmon).

- Items tied to health concerns, such as salt-heavy foods, fried items (due to heartburn), and items perceived as overly indulgent (e.g., chips).

Cultural and Ethical Considerations

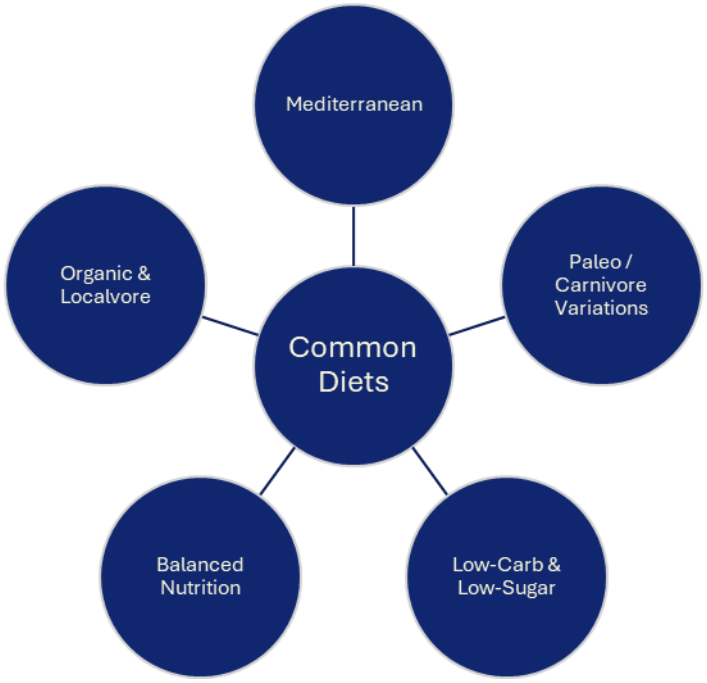
- Some express religious reservations against certain ingredients in their foods or the ways they are prepared
- Some participants reject GMOs and prioritize non-GMO options or avoid food that does not align with their ethical and sustainability values.
- Food deserts and limited access to suitable options during travel or events exacerbate frustrations with adherence to dietary needs.

Summary

Participants express a mix of health-related, ethical, and sensory-driven food restrictions. These include broad aversions to processed and chemical-heavy foods, dietary needs such as gluten- or dairy-free diets, and specific ingredient allergies or sensitivities. Preferences lean toward fresh, natural, and minimally processed foods to maintain health and satisfaction

Common Dietary Patterns

Figure 19. Common Diets



Diets

Mediterranean Diet:

- Focused on fresh vegetables, fruits, whole grains, nuts (except where specifically avoided), olive oil, and lean proteins like fish.

Paleo and Carnivore Variations:

- Emphasis on high-protein intake, excluding processed foods and grains.
- Includes vegetables in some cases but avoids nuts and processed carbs.

Low-Carb/Low-Sugar Diets:

- Participants aim for minimal sugar intake (e.g., under 20 grams daily) and reduced carbohydrates to maintain balanced nutrition.

Balanced Nutrition with Specific Additions:

- Incorporates foods high in fiber, fermented foods, probiotics, and key nutrients like vitamin E and zinc.
- A balanced food pyramid approach, integrating all food groups in moderation.

Focus on Natural and Home-Grown Options:

- Grass-fed meats with no growth hormones.
- Use of home-grown produce like tomatoes, Thai peppers, mint, basil, and marjoram for freshness and sustainability.

Common Objectives Behind the Diets

- Prioritizing health benefits through balanced or nutrient-dense diets.
- Limiting processed ingredients, sugars, and carbs.
- Enhancing diets with fresh, minimally processed foods and home-grown produce.

Participants' Desires for Meal Planning Tools and Features

Figure 20. Participant Desires for Meal Planning Apps

Pantry and Inventory Management

Participants want tools to scan and track pantry items:

- Automatically update inventory as items are used.
- Notify when ingredients are near expiration.
- Cross-reference pantry contents with favorite recipes to suggest meal ideas that meet dietary needs and preferences.
- A checklist or inventory system for easy tracking (e.g., to avoid buying duplicate items like spices).

AI-Powered Assistance

Interest in a comprehensive AI assistant capable of:

- Integrating with maps and calendars to plan meals based on location, work schedules, and events, especially for quick and easy meals.
- Acting as a supportive tool for meal prep and planning in the way a traditional family role might have functioned in previous generations.
- Anticipating individual needs, such as dietary restrictions, invisible health requirements (e.g., probiotics for digestion and cognitive support), or favorite products and discounts.
- Building trust and providing transparency in its suggestions and recommendations.

Enhanced Grocery Shopping Experience

Desired improvements include:

- Simplified application of meal deals, coupons, and discounts directly to shopping carts.
- Accurate recall of previous orders and recipes tied to ordered ingredients for repeat use.
- Tools for anticipating discounts or availability of preferred items.
- Systems to ensure grocery quality (e.g., flagging expired or missing items) and providing a feedback mechanism for accountability.

Recipe Management

Features like:

- A user-friendly recipe index that links with pantry inventory to suggest compatible meals.
- Ability to store, recall, and organize recipes more efficiently, avoiding the frustration of scattered or lost recipes.

Inspiration and Learning

Participants value engaging features, such as:

- Demo cooking videos for step-by-step inspiration.
- Community-building opportunities with local groups to exchange advice and ideas based on dietary restrictions or preferences.

Summary

Participants envision a robust, user-friendly system to simplify meal planning while addressing practical, personal, and dietary needs. From inventory tracking and AI-powered tools to better recipe management and grocery accountability, these desires aim to streamline planning, foster creativity, and build trust in the process.

Design Opportunities

Using the rich insights from participants, here's a synthesis of design opportunities for the ideation phase of an ideal meal planning app, focusing on addressing frustrations, desires, and practical needs:

Core Features

Pantry Inventory Management:

- Scannable pantry item tracking (e.g., barcodes or manual entry).
- Automatic updates to inventory when items are used or nearing expiration.
- Integration with meal plans to adjust quantities based on planned recipes.

Intelligent Recipe Integration:

- Recipe suggestions based on pantry contents and user preferences (dietary restrictions, taste, etc.).
- Ability to cross-reference saved recipes with available ingredients.
- A personalized recipe index to store, recall, and organize frequently used or favorite meals.

Smart Grocery Planning and Shopping:

- Generate smart shopping lists that cross-reference pantry inventory and planned meals.
- Notify users of recurring items or commonly needed ingredients.
- Integration with grocery apps to seamlessly add ingredients to carts.
- A feedback system for grocery order issues like missing items or poor quality.

AI-Driven Assistance

Personalized Meal Recommendations:

- Use AI to tailor meal plans based on user location, calendar events, and dietary needs.
- Suggest quick or easy meals for busier days and special recipes for occasions or holidays.
- Account for invisible needs, such as health conditions, probiotics, or emotional connections to food.

Discount and Deal Tracking:

- Predict sales and discounts on frequently purchased items.
- Notify users about savings opportunities tied to their dietary staples.

Interactive Cooking Support:

- Demo cooking videos linked to chosen recipes.
- Step-by-step cooking guides integrated with timer or alert features.
- Options to adjust recipes for serving sizes or ingredient substitutions.

Seamless User Experience

Enhanced Usability:

- Provide a straightforward, minimalist interface to reduce time spent learning the app.
- Easy toggling between recipe storage, meal plans, and shopping lists.
- Options for visual or physical note-taking, like snapping a photo of a list or linking handwritten notes.

Flexibility and Adaptability:

- Allow users to manually or automatically adjust plans when schedules change.
- Enable quick swaps for unavailable or expired ingredients.
- Handle varying levels of engagement, from detailed planners to reactive users.

Community and Inspiration

Social Connections:

- Foster a community for users with similar dietary restrictions to share advice, recipes, and tips.
- Include a feature for swapping recipe ideas or meal plans with friends or family.

Source of Inspiration:

- Curate recipe ideas through social media integrations (e.g., Pinterest, Instagram).
- Provide "novelty item" suggestions to keep meal planning creative and engaging.

Trust and Ethical Alignment

Building Trust:

- Emphasize transparency in app functionality and data security.
- Provide clear explanations of cost estimations and integration with grocery stores.

Ethical Support:

- Highlight sustainable food sources and eco-friendly options.
- Include culturally diverse recipes to ensure inclusivity and authenticity.

Additional Opportunities

Health and Wellness Integration:

- Tie meal plans to broader health goals, like fitness tracking or dietary monitoring.
- Include reminders to prepare, cook, and eat at appropriate times to reinforce consistency.

Offline Functionality:

- Enable offline access for users in areas with limited connectivity or those avoiding constant reliance on technology.

Summary

The ideal meal planning app combines practical functionality with personalized, AI-driven features to reduce effort, enhance inspiration, and address ethical or emotional aspects of food. With seamless integration across pantry management, recipe storage, and shopping coordination, it creates a holistic, user-friendly experience.

User Personas

First, all observations after being data entered into a spreadsheet were placed on sticky notes and arranged in an empathy map according to participants' shared sentiments among the categories of "does," "thinks," "feels," and "says" (Figure 21). Each sticky note was annotated with an abbreviated reference to a participant and stacked shared observations were considered. Patterns of demographics, habits, goals, and frustrations were grouped in Affinity Map 1(Figure 22). Later, these observations were re-grouped and assigned cluster names into Affinity Map 2 to be later discussed

Figure 21. Empathy Map

Figure 22. Affinity Map 1

See the appendix for fully detailed user personas. Here only are the simplified slide versions of them are depicted. Though, worth mentioning here are some key distinguishing user group habits, differences in their relationship to food, and differences in time spent in meal planning relative to their available free time.

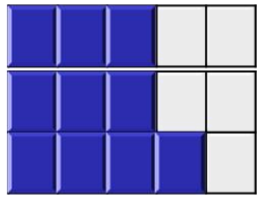
Table 1. Personas Compared

Human User Persona	Definitive Habits	What *Is* Food?	Weekly Meal Planning Time
Jessica	Parent with children at home, relies on leftovers for lunches. Consolidates shopping and meal prepping to mostly once a week, may eat out as needed to pivot. Prefers to grocery pick-up to save time. Seeks mostly quick, but affordable and food sensitive options.	It's time and money It's fuel	11 hrs / wk ~ 32.3% of Jessica's weekly free time
Lisa	Empty nester, usually eats small portions and only twice a day Shops as needed, often for the current day it is needed Prefers to shop in-person, for quality & value consumption purposes Seeks novelty, aesthetically pleasing, healthy, DYI options Mostly uses food-apps as a source of recipe inspiration	It's medicine or poison It's a way to bond and be remembered It's freedom and self-reliance	8.3 hrs / wk ~24.4% of Lisa's free time
Robert	Single person with a tight budget Minimalist shopping and same day food prep in which he needs something, but bulks up on food during mark-down days Prefers to in-store shop for best deals, choosing quality produce, and social opportunities Seeks affordable and food sensitive options Meal planning complicated by health reasons and available cooking options and recipes when travelling for work Uses wide variety of apps, but food-related apps serve for grocery store coupon and rebate redemption purposes	It's survival It's security It's nutrition	6.8 hrs / wk ~20% of Robert's free time

Jessica Moore

Age: 39
Education: master's degree
Location: Cedar Park, TX
Occupation: Educ. Diagnostician
Family:

Home Cooked Meals:
Personally Cooks:
Food App Use:



"I'd rather find recipes that I could cook in one pot so there'd be no extra dish clean up."

Goals

- Need to find ways to **find time** to just exist
- Recipes that are easy to plan; **dietarily sensitive; convienent** to pick up and quick to make; and affordable.
- Keeping the family on track with the **schedule**
- Stocking the family with all its dietary restrictions, preferences, and different event schedules
- **Balancing** work and family life

Frustrations

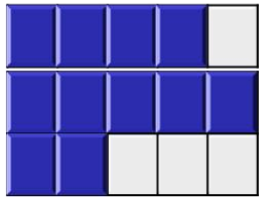
- **No idea what's in the pantry**, fridge, or freezer, or what has expired or not, finds its just quicker to add things to the cart.
- **Trying to overlap with and coordinate** with husband and kids different meal needs and preferences for the coming week
- **Having to drive a lot** back and forth between kids practice, school, work, and home
- Navigating back and forth between Pinterest and grocery store ordering app on the phone

Jessica is a time-starved full time working mom of three with full schedules and diverse dietary needs, She wants to reclaim some free time and mental load in meal planning and preparation activities which already take a third of her free time, just to find time to "exist."

Robert Wilson

Age: 42
Education: master's degree
Location: Ft. Lauderdale, FL
Occupation: Archaeologist
Family:

Home Cooked Meals:
Personally Cooks:
Food App Use:



"My food armory gives me security in the face of power outages, Sharknado, or whatever."

Goals

- Finding the best affordable **nutritious deals** on food
- Stocking up on **flexible ingredients** usable in many recipes
- Making sure nothing goes to waste
- **Penny pinching**, taking advantage of every rebate, coupon, and discount.
- **Fighting lonliness** and making someone else's week, making conversation at store
- Finding stores which carry foods which he can eat with his **dietary restrictions**

Frustrations

- Not knowing where he can both find the **best deals** and recipes
- Not knowing **what he can make with what stores are available** to him in his local area or on the road for work
- Knowing **substitutions** for ingredients or cooking alternatives for recipes on the road (in a hotel) that he can make with what grocery stores are available in unfamiliar or **remote places and make in his hotel room**.
- **Feeling invisible** at work functions, conferences, restaurants, and grocery stores when there are no options which he can eat.
- Not knowing some new healthy recipes to **mix up his routine** staples
- Check-out clerks who don't properly ring up his coupons

Lisa Andersen

Age: 60
Education: bachelor's degree
Location: Missoula, MT
Occupation: Nurse
Family:

Home Cooked Meals:

Personally Cooks:

Food App Use:

"I like to know where my food comes from, go for what looks good, but what's good for everyone."

Goals

- Exploration of **novel, healthy,** and **aesthetically memorable** foods
- Collecting tried and true recipes everyone is bound to love
- Using food to make memories and social **bonding**
- **Inclusively** remembering everyone's needs and the different categories of staples
- Recipes that are **seasonal** and incorporate **homegrown**/harvested foods, farmer's market picks, and help with self-sufficiency lifestyle
- **Flexible** ingredients that can work in a variety of recipes, and be cooked a variety of ways, to avoid extra store-trips
- Ability to coordinate planning and shopping with spouse
- Supporting the **local** community with consumer choices

Frustrations

- Cookbooks **lacking illustrations** or finds the print hard to read, and directions not upfront.
- Finding small **portions** sizes in grocery store and recipe portions, as an empty-nester
- Stores'/delivery services without accountability in grocery store pick-up or meal delivery apps
- **Not knowing** what novel or new things are available in-store if not going in-person, fear of missing out when husband shops instead.
- Skeptical of security/**privacy** of apps and developer's data use or identity theft
- High **learning curves** with little pay-off of app use, and inability to voice frustrations
- **Traffic** on the roads or store aisles
- Apps are harder to use than websites
- **Checking for additives**, preservatives, GMO, and more on labels and its invisibility on apps than in-person

Lisa, an empty nester who isn't very techy and needs readers for pages of text, and who does like to entertain guests with novel-aesthetically pleasing dishes from her garden, seeks recommended recipes which show the ingredients via pictures and a video of the steps used to make a dish with her garden vegetables This way she can take pride in knowing where her food comes from and create memorable experiences for her guests with dishes which are a feast to the eyes.

Mirage Lake

Age: 60
Actant Type: Artificial lake
Location: Texas
Relationship to Users: Direct

"... I've got herbicides runnin' through my veins, plastic trash floatin' by, causin me pains...."

Goals

- Support **biodiversity** and to avoid eutrophication
- Be **replenishable** to all users and to avoid drying up
- Be respected, transparency, and to see **accountability**

Frustrations

- Single-use food packaging, plastic bag, and plastic water bottle **littering** in watershed leaching microplastics into water supply, which is not filtered out in water treatment
- Fertilizers, herbicides, and pesticides **contaminants** in water supply
- **Run-off** from tilling practices among producers in watershed, causing silt to choke up water treatment system and making treatment ineffective leading to boiling notices
- **Lack of reusable containers options** for bulk food shopping at grocery stores
- **Wasted water** on lawns and inefficient irrigation
- Really **lax regulatory system**, which isn't seriously invested in safe food, accountability, or transparency.

Mirage is non-human stakeholder lake who is affected by and affects its human users, who are concerned with quality and safe food. Mirage needs to make its human users easily informed on eco-friendly choices available when shopping, because Mirage wants to be enjoyable to the widest number of humans and non-humans and doesn't want to be choked up on run-off silt, pollutants, dry-up, or end up eutrophicated.

Competitor Audit Analysis Findings

Methods

Objectives

The goals of this analysis were threefold:

- Identify key features and innovative solutions within meal-planning apps, focusing on their relevance to user needs.
- Analyze app store comments to extract unmet needs, successes, and common complaints from real users.
- Cross-reference insights from UXR exploratory research with app store feedback to inform how receptive the market is to emerging solutions.

Research Questions

Our inquiries aimed to shed light on the competitive landscape:

- How prevalent are apps with the six targeted functionalities, and in what combinations?
- Which design aspects are uniquely memorable or particularly effective?
- What user challenges and complaints dominate app store reviews?
- What design elements consistently receive praise from users?
- Who is using these apps, and what are their defining characteristics?
- What friction points exist in one-stop-shop meal-planning apps?

Comparison Criteria

- To evaluate competitors comprehensively, we compared the following aspects across apps and their platforms (apps and websites):
- Feature Functionalities: core and distinctive capabilities.
- Audience Profile: User demographics and preferences.
- First Impressions: Initial usability and appeal.
- User Interaction: navigation flow, responsiveness, and accessibility.
- Visual design: aesthetic quality and branding consistency.
- Content: relevance and clarity of information.
- Memorable attributes: standout elements that resonate with users.
- Advantages: competitive strengths.
- Hindrances: limitations or potential pain points.
- Pricing: affordability and value proposition.
- Review rating and number of reviews: ratings and review volume across platforms.

The analysis distilled findings into structured tables, discussions, visualizations, and a SWOT analysis.

Results

Key Competitors' Type and Quality of Products

Two standout contenders dominate the one-stop-shop meal planning space: Jow and Cooklist. These apps cater primarily to Millennial mothers juggling family responsibilities. Multi-functional apps were much fewer than niche apps that focus on limited aspects such as recipe management or grocery lists.

Figure 23. Jow

Jow offers a streamlined app emphasizing lifestyle diversity and curated recipes tailored to portions. Desktop functionality and the ability to filter by kitchen equipment make it family-friendly. However, the absence of pantry inventorying leaves users to navigate "forgotten fridge territory." Jow positions itself as a warm, approachable solution for family meal planning, focusing on efficiency and joy. It offers a more affordable option and 3.7 / 4 stars on the Google Play Store's (rounded) 13,000 ratings.

Figure 24. Cooklist

Cooklist provides a tech-savvy app leveraging pantry inventory and AI-assisted recipes. Syncing across devices and sustainability features appeal to eco-conscious users. Despite these strengths, desktop compatibility and family-centric filtering options are notably absent. Leans into its technological prowess, branding itself as the practical, budget-friendly choice. However, its faceless branding risks feeling impersonal. It offers an expensive option, but with a 4.2 / 5 star on Google Play Store's (rounded) 1,000 ratings and all that it can do it is also reasonably priced.

Figure 25 compares the competitive landscape of meal planning tools along degree of social interaction needed versus degree of focus in functionality. Mapping these tools on a social interaction and functionality matrix reveals their strategic positioning, guiding users to the app that fits their lifestyle best. "Social interaction" shows how a tool necessitates going in-person or in-store in contrast to online shopping or grocery pick-up, reflecting different lifestyle needs. Embedded in social interaction is also a component of a preference doing meal planning in an analog or more-or-less automated manner. "Functionality" focus reveals how specialized or broad an app's offerings are. This comparative framework highlights how we connect with food, technology, and each other, ensuring everyone finds their perfect culinary companion.

Figure 26 compares the highlighted region of previous competitive landscape and then compares meal planning tools along their degree of filter customization and cooking context considerations. "Customization" captures the number of filter options for things like the "what" is going to be eaten or not, such as diet, preferences, aversions, etc. Customization is important for serving more diverse user needs and reflects a greater design complexity. In contrast, "Cooking context considerations" is more about the app's ability to support the how, when, and why things are cooked or shopped for, such as a user's goals, available pantry items, geographic options, and available appliances to cook recipes.

Figure 25. Competitive Landscape of Meal Planning Apps/Tool

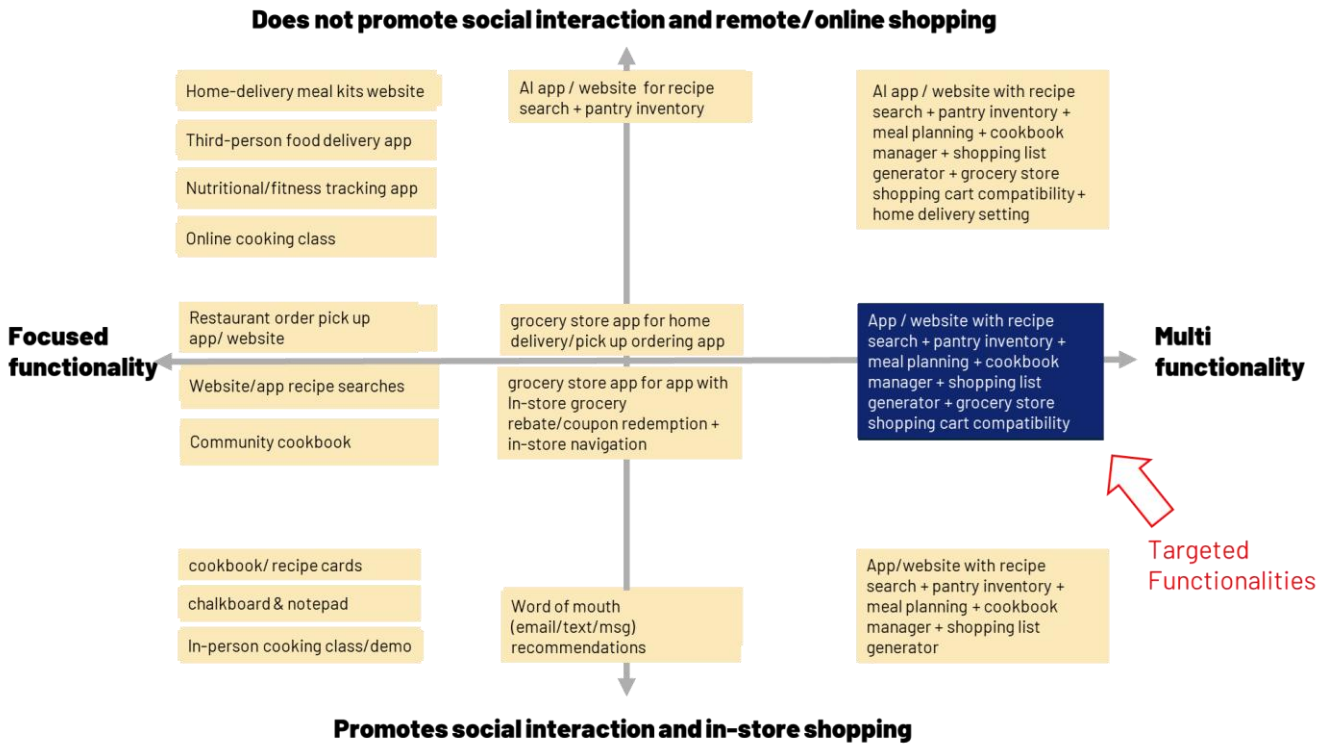
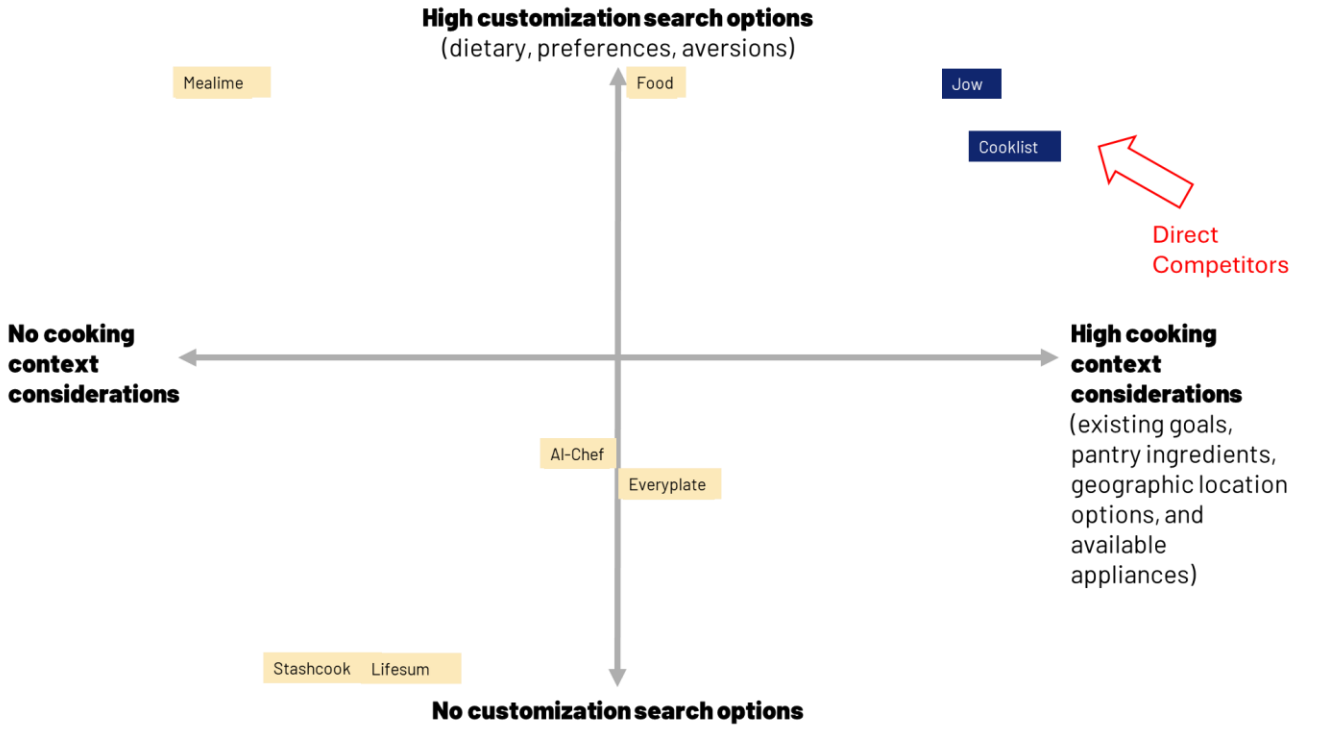


Figure 26. Comprehensive Meal Planning Plans



How do the Competitors Position Themselves?

Jow presents itself as an efficient and friendly solution for families to discover recipes that cater to their diverse diets, preferences, and kitchen setups, thus enabling them to focus on the enjoyable aspects of life. Its brand emphasizes fun, freshness, enjoyment, and health.

Cooklist, on the other hand, positions itself as a smart option for reducing grocery expenses and minimizing food waste, while ensuring everyone in the family is synchronized. Its brand highlights intelligence, problem-solving, and practicality, aiming to take care of everything seamlessly.

Competitors' Strengths

Jow and Cooklist have emerged as noteworthy contenders in the one-stop-shop meal planning arena, each boasting unique strengths that cater to specific user needs.

Jow excels in enabling a budget-conscious approach to meal planning, integrating desktop functionality that proves invaluable for family-oriented users. Its intuitive design and straightforward button layout streamline the user experience, allowing for seamless navigation through a variety of culinary options. The app's capability to filter recipes by kitchen equipment adds an extra layer of convenience, making it possible for households to tailor their meal planning to the family's diverse dietary requirements. Additionally, Jow's innovative cooking video demonstrations and seasonally-inspired recipes foster an engaging and joyful cooking environment, while its menu customization features significantly reduce food waste by aligning portion sizes with household needs.

Cooklist distinguishes itself through its advanced AI-assisted recipe suggestions, which offer an infinite scroll of ideas tailored to personal preferences and pantry inventory. This cutting-edge approach ensures users can efficiently manage their food supplies, creating a sustainable and budget-friendly cooking experience. Cooklist further impresses with its ability to synchronize across multiple devices, enhancing accessibility for family members on the go. The app's comprehensive recipe import options, including scanning and online links, as well as its cookbook customizability, provide users with a versatile tool for meal planning. Moreover, Cooklist's smart pantry feature alerts users to expiring food items, prompting timely updates to prevent waste. The app's ability to highlight recipes requiring minimal ingredients based on current inventory exemplifies its commitment to practicality and environmental consciousness.

However, both platforms exhibit areas for enhancement. Jow could improve by incorporating pantry inventory functionality, offering a more holistic approach to meal planning while Cooklist might expand its recipe filtering capabilities to accommodate available kitchen equipment, particularly useful for users on the move.

In sum, while both Jow and Cooklist have carved out significant niches in the meal planning space, their continued evolution could further enrich the user experience, reflecting a dynamic interplay of technology and culinary creativity. In this fast-evolving digital landscape, the journey toward a more integrated and sustainable meal planning process continues to unfold, promising exciting innovations on the horizon.

Competitors' Weaknesses

Jow's reviewer comments suggest that users occasionally experience login issues, which can be inconvenient. Additionally, some users find that non-food items, such as toiletries or favorite kids' snacks, cannot be added to their cart, limiting the holistic shopping experience. There are also concerns that the defaulted items in the cart may not always be the most economically savvy option. While the recipe selection is appreciated, there is a desire for broader culinary diversity. Furthermore, users have expressed a need for more transparency in how prices are calculated in the cart, suggesting that building rapport with customers could be enhanced with clearer communication.

Cooklist is praised for its organized approach to pantry management but could benefit from expanding its functionality to cater to diverse dietary and family needs, ensuring its utility for a wide range of users. Non-food items also seem to be excluded from the cart, which could be seen as a gap in providing a comprehensive shopping list. The receipt scanning feature, while innovative, sometimes experiences technical issues that can be frustrating. The app's desktop functionality could be improved, making it more user-friendly across different devices. Additionally, the company's relatively low-profile presence and lack of identifiable figures might hinder the establishment of a personal connection with its user base.

Gaps

Both Jow and Cooklist have user-perceived concerns about security. Jow has feedback suggesting a need for improvement in the login process, which occasionally presents inconvenience. Meanwhile, Cooklist's receipt scanning feature, although innovative, sometimes encounters technical difficulties.

Moreover, neither Jow nor Cooklist extends lifestyle considerations—such as dietary and ethical choices—from the recipe search level to the grocery cart level. Users have expressed a desire for a more holistic shopping experience that reflects their personal preferences when selecting ingredients and brands. Additionally, both platforms could benefit from remembering predictable staples and non-grocery items that users regularly add to their carts, such as favorite kids' snacks or toiletries. This would create a more seamless and comprehensive shopping experience.

Cooklist could enhance its recipe filtering process to account for available kitchen equipment, particularly beneficial for users traveling or on the road. Improving desktop functionality and adding guided cooking videos would also elevate the user experience.

Conversely, Jow could enrich its offerings by incorporating pantry inventory functionality, thus helping users manage their food items more sustainably and efficiently.

In summary, while both apps offer valuable features, addressing these gaps would further refine their services and bolster user satisfaction.

Opportunities

Some opportunities we identified include:

- Building trust with users through friendly branding and providing points-of-contact, faces associated with company roles, privacy assurances that prioritize users' best interests,

and an active community and online presence; along with clear explanations of how cart calculations are done.

- It is essential for the shopping cart feature to reflect consumer lifestyle decisions by considering ingredients, prices, and certifications, similar to how lifestyle preferences are factored into recipe searches.
- A valuable addition would be the ability to remember buying historically or manually entered staples and non-grocery items that need to be included in the cart.
- Recipe search functionality must cater to multiple diets, allergies, and preferences simultaneously, ensuring a family-friendly meal planning experience.
- The ability to share a family account synced across devices is key for a seamless family meal planning app.
- Incorporating accessibility features for neurodiverse users, such as visuals for cooking recipes and organized tabs for kitchen equipment, ingredients, and steps with cooking demo videos, would greatly enhance user experience.
- Lifestyle considerations should also account for available kitchen equipment, especially for users who are traveling or on the road. The ability to search groceries based on location and route, and to add recipes from anywhere online to one's cookbook, would be highly beneficial.
- A desktop-friendly or website version, along with the option to prepare a shopping list without necessarily placing an online order, would provide greater convenience.
- These suggestions aim to elevate the user experience, addressing both practical needs and personal preferences, and ensuring that the platform caters to a wide range of users in a comprehensive, thoughtful manner.

Feature Comparisons

Figure 27. General Aspects Compared

Aspects	Meal Maven	Jow	Cooklist
Upfront privacy, point-of-contacts, accountability	X	X	
Ease of inter-app navigation	X		
Desktop and app versions fully functional	X	X	

Figure 28. Recipe Search Functionality Compared

Aspects	Meal Maven	Jow	Cooklist
Search by available kitchen equipment	X	X	
Search by multiple complex diet options	X	X	
Add something new to meal rotation without steep learning curve	X	X	
Visuals for recipe and cooking steps	X	X	
Search recipes around on-hand ingredients	X		X
Recommended recipes from social media sharing	X		X
DYI / Seasonal recipe meal planning	X	X	
Shelf stable recipes & flexible ingr. recipes	X		
Quick substitutions advice	X		X
Edit recipes by portions	X	X	

Figure 29. Cookbook Functionality Compared

Aspects	Meal Maven	Jow	Cooklist
Remembers favorite recipes, including imported ones	X		X
Calculates costs of meal and shows how much each of your favorite recipes will likely cost	X		
One-pot, kid friendly, and quick option recipes	X	X	X
Easy importing of recipes from anywhere	X		X
Neurodiverse-friendly cook mode and organization of tabs to jump to what's needed (equipment, steps, ingredients)	X		X

Figure 30. Meal Planner Functionality Compared

Aspects	Meal Maven	Jow	Cooklist
Calendar	X	X	X
Meal plan calendar sharable with family & multiple device syncing	X		X
Notification/remind to take-out things from the freezer	X		
Self-sufficient planning mode	X		

Figure 31. Shopping List Functionality Compared

Aspects	Meal Maven	Jow	Cooklist
Family-sharable shopping list	X		
Remembers "buckets" of staples	X		
Ear-marks ingredients with certain recipes and plug-in calendar/meal plan	X		
Can move ingredients list into multiple grocer carts	X		X

Figure 32. Grocery Store Plug-in Functionality Compared

Aspects	Meal Maven	Jow	Cooklist
Select stores by values	X		
Select stores by geographical proximity	X	X	
Select stores by along user routes	X		
Accountability with ingredients, color coded items according to filter restriction	X		
Call attention to good item's size, even comparison pop up	X		
Awareness of new/novel things available	X		
Search seasonally available CSA and Farmer Markets' items	X		
Reminder to bring reusable bags ahead of planned store visit	X		

Figure 33. Pantry Inventory Functionality Compared

Aspects	Meal Maven	Jow	Cooklist
Advice for food preservation	X		
Reminders about expiring goods	X		
Smart updates based off previous orders' goods' expiration, in addition to scans and manual entry	X		X
Family sharable and updatable pantry	X		
Reminder to use meal plan bulk ingredients and rotate food armory/pantry to prevent waste and build stock	X		

Understanding the User Journey

Primary User Persona

Jessica Moore is a dedicated and nurturing full-time working mom of three, juggling a busy household with diverse dietary needs. Her life revolves around her family, and she values dependability, efficiency, and flexibility. Jessica's primary goal is to save time and reduce the mental load associated with meal planning and preparation, which currently consumes about a third of her free time.

Goals and Motivations:

Jessica aims to streamline her meal planning process to reclaim time for herself and her family. She seeks quick, affordable, and food-sensitive options that accommodate her family's dietary restrictions and preferences. Her weekly routine includes consolidating shopping and meal prepping into one major session, relying on leftovers for lunches, and occasionally eating out to pivot when needed. Jessica prefers grocery pick-up services to save time and uses a variety of food apps for meal planning.

Definitive Habits

Meal Planning Resources: Jessica utilizes a mix of traditional and digital tools, including a chalkboard, notepad, smartphone photo album, cookbooks, Pinterest, Google searches, grocery store order apps, restaurant apps, food delivery apps, and text messages.

Grocery Store Preference: She is loyal to a particular grocery store chain that supports her community, offers family-friendly meal kits, and has a user-friendly order pick-up app. The store's geographic proximity along her daily route and the availability of curbside pick-up and home delivery options are crucial for her.

Frustrations and Pain Points

Jessica faces several challenges in her meal planning journey:

- Time Constraints: She struggles to find enough time to just exist, as meal planning and preparation take up a significant portion of her free time.
- App Limitations: The grocery store app doesn't remember her regular staples or offer a place to save recipes, leading to repetitive tasks each week.
- App Overload: Navigating between multiple single-functionality apps is tiring and adds to her mental load.
- Lack of Consolidation: She wishes for a shared family schedule, meal plan, and shopping list in one place to allow for collaborative updates.
- Ingredient Management: Jessica often forgets what she has in her pantry, fridge, or freezer, leading to overspending and food waste.
- Boredom: She needs to mix up her typical recipe rotation to avoid monotony.
- Online Shopping Challenges: Misjudging food sizes from online pictures and dealing with app ads are additional sources of frustration.

Personality and Values

Jessica is loyal, dedicated, nurturing, playful, and somewhat introverted. She values family, dependability, efficiency, respect, inclusivity, flexibility, growth, honesty, and fairness.

Skills and Capabilities

Jessica is tech-savvy, with a phone full of various apps, including food-related ones. She is a multi-tasker and the family time-keeper but struggles with remembering remaining ingredients and spatial object thinking. She tends to overspend when shopping online.

Relationships Affecting Meal Planning

Jessica's meal planning is influenced by her husband's and children's dietary restrictions and preferences. Coordinating communication about order pick-up and ingredient needs with her husband and managing kids' activities are integral parts of her routine. She also plans extra special meals for holidays.

Problem Statement

Jessica is a time-starved full-time working mom of three with full schedules and diverse dietary needs. She wants to reclaim some free time and mental load in meal planning and preparation activities, which already take a third of her free time, just to find time to "exist."

Hypothesis Statement

If Jessica can efficiently find ways to meal plan around different scheduling and dietary demands, then she can free up time and mental load to find time to exist.

Phases

Jessica does meal planning in four phases of actions, and each action has its own tasks. The first major phase “track staples out-of-stock” happens several times as needed over the course of the week, which is essentially list making. The second major phase is a progression of actions starting with “check calendars for meal planning needs.” “search recipes fitting planning needs,” and “assess what’s on-hand and what’s missing.” This phase is the heart of the meal planning activities and concludes with placing an order. The third major phase is “curbside pick-up and communicate week’s meal plan,” which is essentially store visit or grocery pick-up. Sometimes the second and third phase happen on the same day or otherwise happens the next day. The fourth phase is “prepare and cook,” and typically happens on a daily basis.

User Journey Map

Persona: Jessica

Goal: meal planning and preparation activities

ACTION	Track staples out-of-stock during the week	Check calendars for meal planning needs	Search recipes fitting planning needs	Assess what's on-hand and order what's missing	Curbside pick-up and communicate week's meal plan and recipes	Prepare and cook
TASK LIST	• Write down and exchange sticky notes, chalkboard notes, list updates, or notes app entries for later adding to cart • Communicate, share, and inquire on what to add to shopping list	• Communicate and mutually mark calendars for work events, dr. apts, social visits (where eating out is anticipated) or kid activities will require time-out or quick and easy homemade recipes • Note blocks of meal types needed	• Brainstorm and communicate preferences taste and holiday-specific or guests' tastes considerations for recipes • Google search, Pinterest, and cookbook searches for meal type blocky slots with various qualifiers (filters) • List certainly needed ingredients for shopping list based on chosen recipes	• Might check some ingredients or inquire with partner about availability of a given or simply assume its out-of-stock and add recipes ingredient list to car and add week's shopping list • Check coupons and deals for new things or staples or meal kits in grocery app • Add kid snacks and lunch items, and staples to cart • Add other snacks and household supplies to cart • Communicate and plan for pick-up or time delivery	• Might bring bags (reusable bags) if picking up or going in-store • Pick-up or collaborate with partner for pick-up on way from home • Put away groceries • Might communicate meal plan with recipes • Relocate recipes with cook as needed • Consider Special holidays or special date needs	• Find meal plan recipe • Search for ingredient list and browse instructions for kitchen equipment • Pull needed ingredients and kitchen equipment • Reread or watch cooking steps • Prepare ingredients (e.g., wash, chop, slice, etc.) • Set aside ingredients as needed • Reread or watch cooking steps • Cook
FEELING ADJECTIVE	• Productive • Proud • Forward-thinking	• Worried • Uncertain	• Productive • Fulfilled • Impatient • Overwhelm	• Overwhelm • Hesitancy • Amused (feels like a game) • Annoyed • Apprehensive • Proud	• Anxious • Guilt • Fulfilled • Proud • Irritated • Worried	• Hopeful • Playful • Inspired • Worried • Confused
IMPROVEMENT OPPORTUNITIES	• Import shopping list into grocery apps • Have shared shopping list	• Suggest meals/recipes or meal types by calendars • Shared calendar events codable by needed meal type	• Ability to suggest recipes based on what is expected to b on-hand • (pantry app) or plan around using an ingredient • Ease of inter-app toggling • Complex recipe search options • Share meal plan in-process • Calendar + plan share or import	• Search stores by values and geography • Budgeting balance being updated from cart check-out • Filter choices by certifications, ethics, values, and ingredients • Pantry list automated with ordering and updated by expiration and meal plan date • Store remembering previous for list patterns and staples ease of adding • Ability to scan barcodes of items in-stock note already inventoried	• Shares and saves meal plan with recipes and saves recipes into cookbook and grocery shopping cart • Reminders to bring bags and to get holiday goods • Notification to take things out to defrost for planned meal needing it	• Need cookbook manager to store and recall recipes connected to meal plan • Need the screen lock to not time out and lock screen while reading or watching cooking steps • Pictures and/or videos of cooking steps

Conclusion and Design Recommendations

This chapter wraps up the research by synthesizing key findings, addressing their implications, and proposing actionable recommendations to inform the next phase of design. It balances reflection on the insights gained with forward-looking solutions tailored to user needs and project goals.

Recap of Key Insights

Recurring Themes:

- **Collaboration and Roles in Meal Planning:** Many households have a clear division of labor, with one partner often taking primary responsibility for grocery shopping and planning, while the other assists as needed. Collaborative decision-making and the use of technology, such as shared apps and note-taking, support this teamwork.
- **Philosophical Approaches:** Participants adjust their plans based on changing circumstances, such as craving shifts, midweek ingredient shortages, or unexpected events. Some take a minimalist and reactive approach, focusing on staples that allow for flexible, mix-and-match meals.
- **Planning Tools and Techniques:** Tools like chalkboards, phone apps, and lists are central to organizing shopping and meal prep. Visual inspiration from cookbooks, YouTube, or Pinterest plays a significant role in recipe selection.
- **Financial Considerations**: Economical shopping is a recurring theme, with participants prioritizing deals, coupons, or discounts to manage budgets.
- **Cultural, Sensory, and Experiential Drivers:** Meal planning can transcend practicality; some participants emphasize creating meaningful experiences through meals, such as invoking memories, offering hospitality, or impressing guests.

Pain Points:

- **Logistical Challenges**: Navigating congestion, traffic, and crowded stores is a frequent frustration. Multiple store visits to find specific ingredients add inconvenience. One “Lisa” commented, “There are too many inconsiderate people… We avoid people on the road and in the store.”
- **Technology-Related Frustrations**: Distrust in technology and inefficient apps are common issues. Participants avoid pantry inventory apps and grocery pick-up services due to concerns about quality and accuracy. One “Lisa” lamented, “All your problems could be solved if you did it yourself.”
- **Food-Related Limitations**: Seasonal or regional limitations and concerns about food labels require time-consuming research to avoid undesired additives. One “Lisa” reflected, “I hate it when I get my groceries home and find something has corn syrup in it and then have to make it myself just so it won't taste like Kindergarten paste- but having to research it ruins my whole flow.”
- **Mental and Emotional Load**: Planning fatigue, overwhelming choices, and boredom from repetitive meals contribute to the mental burden of meal planning.
- **Social and Ethical Considerations**: Some participants lament the loss of social connection during grocery delivery or app-based shopping. Ethical worries about the food system and sustainability labels add another layer of frustration. One “Robert”

shared, “During Covid, I incorporated trips to grocery store in order to see other people for the social interaction. Yes, it was distance, yes it was necessary for spiritual healthy to just interact with other people, but having brief contact and conversations was totally necessary to maintain contact with society. I built grocery stores into my routine just to look forward to the social interaction it gave me and got me out of the house.”

Opportunities:

- **Pantry Inventory Management:** Implementing scannable pantry item tracking and automatic updates to inventory when items are used or nearing expiration can help users manage their food supplies more efficiently.
- **Intelligent Recipe Integration**: Providing recipe suggestions based on pantry contents and user preferences, along with a personalized recipe index, can enhance the meal planning experience. One “Jessica” had expressed desire for recipe browsing based off her demands of the week saying, “I'd rather be able to find recipes that I could cook in one-pot, so there'd be no extra dish clean up.”
- **Smart Grocery Planning and Shopping**: Generating smart shopping lists that cross-reference pantry inventory and planned meals, along with integration with grocery apps, can streamline the shopping process.
- **AI-Driven Assistance**: Using AI to tailor meal plans based on user location, calendar events, and dietary needs can provide personalized meal recommendations and support. One “Jessica” remarked. “An AI assistant could help in ways that only a traditional family wife could, freeing her up to do more.”
- **Community and Inspiration:** Fostering a sense of community among users by allowing them to share recipes, meal plans, and tips, along with providing inspiration through curated recipe ideas and cooking videos, can make meal planning more enjoyable and engaging. One “Lisa” preferring to tap into our social circle’s tried and true recipes for something new said, “I like a sure thing, I don't like to gamble.”

Core Design Principles

The study's findings propose overarching principles that will guide the subsequent design phases are centered around creating a user-friendly, inclusive, and efficient meal planning app. These principles include:

Accessibility: Ensuring that the app is usable by people with diverse abilities and needs. This includes features like larger text, high contrast colors, and text-to-speech options for those with visual impairments. For Jessica, accessibility features like larger text and high contrast colors will help her quickly navigate the app during her busy day, reducing the time spent on meal planning and allowing her to focus on her family. For Lisa, text-to-speech options and larger images will make it easier for her to follow recipes and manage her pantry, enhancing her cooking experience. Robert will benefit from a straightforward, anticipatory, and minimalist interface that reduces the learning curve and allows him to quickly find recipes and manage his pantry, even when traveling. Additionally, neurodiversity considerations such as predictable structure, limited color schemes, predictable design and structure, and visual cues will help all personas, especially those with neurodivergent needs, to navigate the app more comfortably.

Efficiency: Streamlining the meal planning process to save users time and reduce their mental load. This involves integrating multiple functionalities into one app, such as pantry inventory management, recipe suggestions, and grocery shopping lists. Jessica will appreciate the integration of multiple functionalities into one app, such as pantry inventory management, recipe suggestions, and grocery shopping lists, which will save her time and reduce her mental load. Lisa will benefit from streamlined meal planning processes that allow her to focus on creating memorable dining experiences. Robert will find it easier to manage his budget and meal planning with efficient tools that help him track pantry items and find affordable recipes.

Personalization: Tailoring the app experience to individual users' preferences, dietary needs, and lifestyles. This includes AI-powered meal recommendations, personalized recipe suggestions, and customizable meal plans. AI-powered meal recommendations and personalized recipe suggestions will help Jessica find quick, affordable, and food-sensitive options that accommodate her family's dietary restrictions. Lisa will enjoy tailored recipe suggestions that align with her health goals and the seasonal produce from her garden. Robert will appreciate personalized meal plans that fit his dietary needs and available kitchen equipment, making meal planning less overwhelming.

Transparency: Providing clear and honest information about ingredients, sourcing, and pricing. This helps build trust with users and ensures they can make informed decisions about their food choices. Providing clear and honest information about ingredients, sourcing, and pricing will help Jessica make informed decisions about her family's meals. Lisa will value transparency in ingredient sourcing and ethical considerations, ensuring she can create healthy and sustainable meals. Robert will benefit from clear information about ingredient quality and pricing, helping him manage his budget and dietary needs.

Inclusivity: Designing the app to be inclusive of diverse cultural, dietary, and ethical preferences. This includes offering a wide range of recipes, supporting various dietary restrictions, and highlighting sustainable and ethically sourced ingredients. Offering a wide range of recipes and supporting various dietary restrictions will ensure that Jessica can find meals that suit her family's diverse needs. Lisa will appreciate the inclusion of culturally diverse recipes and sustainable food sources, allowing her to create meaningful dining experiences. Robert will benefit from recipes that cater to his dietary restrictions and preferences, ensuring he can maintain his health while enjoying his meals.

Community and Inspiration: Fostering a sense of community among users by allowing them to share recipes, meal plans, and tips. The app should also provide inspiration through curated recipe ideas, cooking videos, and social media integrations. Allowing users to share recipes, meal plans, and tips will help Jessica feel connected to a community of like-minded individuals, providing her with new ideas and support. Lisa will enjoy the inspiration from curated recipe ideas and cooking videos, helping her create visually appealing and memorable meals. Robert will benefit from community support and inspiration, making meal planning more enjoyable and less of a chore.

Adaptability: Ensuring the app can adapt to users' changing needs and life stages. This includes features that support different meal planning routines, from daily to weekly planning, and accommodating various family dynamics. Ensuring the app can adapt to users' changing needs and life stages will help Jessica manage her family's evolving schedules and dietary

requirements. Lisa will appreciate features that support different meal planning routines and accommodate her changing preferences. Robert will benefit from adaptable meal plans that fit his busy lifestyle and travel schedule.

Persona-Specific Design Considerations

Here is a concise summary of the personas problems and what would make Meal Maven stand out with design solutions for use in the ideation phase.

Table 2. Jessica Statements and Proposition

Persona	Problem Statement	Hypothesis Statement	Meal Maven's Value Proposition
Jessica Moore	Jessica is a time-starved full-time working mom of three with full schedules and diverse dietary needs. She wants to reclaim some free time and mental load in meal planning and preparation activities, which already take a third of her free time, just to find time to "exist."	If Jessica can efficiently find ways to meal plan around different scheduling and dietary demands, then she can free up time and mental load to find time to exist.	• Family sharable meal planner, list, and pantry tracker • List to remember staples • Planner and list ear-mark ingredients for certain recipes and plug into calendar – to not wonder

Jessica's Scenario

It's a typical Tuesday morning, and Jessica has just dropped her youngest off at daycare. She mentally runs through the day's endless to-do list while sipping her lukewarm coffee in the car—commute to work, three back-to-back meetings, pick up the kids, and somehow get dinner on the table before soccer practice and piano lessons. She sighs as she thinks about her family's increasingly predictable meal rotation: spaghetti Mondays, taco Tuesdays, and a hodgepodge of rushed meals for the rest of the week. Jessica yearns to break the monotony, but the thought of exploring new recipes feels like adding another brick to her already heavy mental load.

Figure 34. Another day for Jessica.

Later in the day, during her lunch break, Jessica opens her grocery store's app to order this week's staples. She scrolls through the usual items but grows frustrated as the app doesn't suggest recipes or remember her frequent purchases. She wishes the app could consolidate her needs, like her kids' gluten-free snacks, her husband's

keto-friendly items, and the ingredients she'd need to cook a fun new dish for a family dinner. Instead, Jessica finds herself toggling between the app, a Pinterest board for recipes, and her phone's photo album, where she's saved snapshots of old family favorites. It's exhausting, and it's only Tuesday.

Jessica's pantry inventory is a blur—did she already buy rice last week, or is she out? She adds it to her cart anyway to be safe, fully aware that she might be overspending and risking food waste. She wishes her grocery app could track her staples and let her know what's running low. By the time Jessica completes her order, her lunch break is over, and she hasn't had a moment to relax.

That evening, Jessica serves tacos again but fantasizes about a future where meal planning is effortless. She imagines an app that doesn't just remind her of what's already in her pantry but also suggests recipes tailored to her family's dietary needs, complete with clear instructions and prep times. Better yet, it could keep everything in one place—a shared calendar, a meal plan, and a shopping list that her husband could contribute to as well.

For Jessica, such a solution wouldn't just save time; it would give her back a precious piece of her day. It would mean fewer frantic Google searches, fewer repetitive tasks, and more time to savor moments with her family—or just to exist, even if for a few stolen minutes with a good book and warm coffee.

Table 3. Lisa Statements and Proposition

Persona	Problem Statement	Hypothesis Statement	Meal Maven's Value Proposition
Lisa Andersen	Lisa, an empty nester with limited tech-savviness and a preference for visual over text-heavy content, enjoys entertaining guests with novel, aesthetically pleasing dishes made from her garden vegetables. She seeks recipes that visually present ingredients and include step-by-step video instructions. This allows her to take pride in the source of her food and create memorable, visually stunning dining experiences for her guests.	If Lisa has access to visually rich, user-friendly recipes that align with the ingredients available from her garden, she will feel confident in preparing inspiring, delightful dishes for her guests and take pride in the origins of her food.	• DYI/Seasonal planning recipe ideas in recipe searches • Recipe searches for food shelf stable recipes and flexible ingredient recipes • Accountability with ingredients and color coded and filters in grocery store app. • Awareness of novel things

Lisa's Scenario

Lisa sat at her kitchen table, surrounded by her chalkboard, cookbooks, and smartphone. The task of planning a dinner for her grandchildren and neighbors felt heavier than usual. With her husband's dietary restrictions, the kids' preferences, and the need to use seasonal produce from her garden, Lisa wondered if this meal would come together as she hoped—or if it would become yet another chaotic juggling act.

Figure 35. Another day for Lisa.

She flipped through one of her cookbooks, hoping for inspiration, but was immediately frustrated. The recipes were buried in text, with few helpful images of the finished dishes or ingredient setups. "How am I supposed to picture this?" she muttered, tossing the book aside. Turning to her phone, she scrolled Pinterest and YouTube for something more visual. Ads cluttered her screen and interrupted the recipe instructions, slowing her progress and testing her patience. Lisa sighed, feeling that finding the right recipes always came with a struggle she couldn't avoid.

The next morning, Lisa headed to the farmer's market, her favorite part of meal planning. There, she picked vibrant carrots, earthy kale, and fresh zucchini from the stalls. The process made her feel connected to the community, a rare bright spot in the planning process. But her second stop at the grocery store wasn't as pleasant. Crowded aisles, specialty items calling for attention, and a tendency to overspend weighed on her. Despite her best intentions, she left the store feeling unsure about whether she'd bought too much or missed something essential.

Back home, Lisa spread her ingredients out on the counter, along with her trusty notepad where she'd outlined the steps for preparing kale pesto pasta, roasted carrot fritters, and a zucchini salad. The prep work tested her creativity, requiring substitutions and adjustments for flexibility. As she worked, she couldn't shake her frustration at how difficult it had been to find recipes tailored to her family's needs, or how hard it was to avoid wasting produce when ingredients weren't perfectly matched to recipes.

Even as the dinner turned out beautifully—her grandchildren adored the fritters, her neighbors raved about the pasta—Lisa felt the weight of the process lingering. Between the hurdles of finding suitable recipes, navigating crowded stores, and overcoming uncertainties about substitutions, the experience left her wondering if there was a better way to simplify meal planning without sacrificing the thoughtful touches that made her meals so special.

Table 4. Robert Statements and Proposition

Persona	Problem Statement	Hypothesis Statement	Meal Maven's Value Proposition
Robert Wilson	Robert is a new career professional who spends significant time honing his craft and frequently travels for work. With a tight budget and special dietary needs, he needs a straightforward way to find recipes he can make without access to a full kitchen—while staying within budget, maintaining his health, and minimizing the time spent adapting to new meal routines. This will allow him to feel secure about his meals and focus his mental energy on his professional growth and higher pursuits.	If Robert can find affordable recipes that align with his available kitchen equipment and dietary needs, without requiring a steep learning curve, he will feel prepared and confident about his meals, allowing him to dedicate more mental energy to his professional and personal growth.	• Recipe search makes adding something new to meal rotation without steep learning-curve • Recipe searches with quick substitutions advice • Cookbook that updates approximately meal cost based on pantry stock and recipe demands

Robert's Scenario

Robert scanned the nearly empty shelves of his pantry before sitting down with his notepad. He knew it was time for one of his big shopping trips, but the process wasn't getting any easier. With a tight budget and dietary restrictions to navigate, Robert often felt like he was playing a high-stakes game of strategy every time he planned meals for the week ahead.

His notepad filled quickly with staples he needed to stock up on—rice, beans, oats, and canned vegetables. But as always, the challenge lay in balancing his minimalist approach with the thrill of hunting for bargains. Robert wanted to make sure he could use every item efficiently while still saving enough money to justify splurging on one or two specialty items for variety.

Figure 36. Another day for Robert.

The next day, Robert set out on his shopping trip, starting at his favorite grocery store. He made a beeline for the clearance section, eyes scanning

for markdown stickers. His gregarious nature came alive as he struck up a conversation with a store employee about some discounted organic produce. Moments like these gave him a sense of connection, even on mundane errands. Still, he found himself juggling multiple apps on his phone to check for coupons, track rebates, and compare deals. He sighed, wishing there was a simpler way to streamline the process.

By the time he got home, Robert was exhausted but pleased with his haul. Organizing his groceries into his small pantry was like solving a puzzle, one that his sharp spatial thinking made easy. He took inventory and mentally planned his week: stir-fry on Monday, lentil soup on Tuesday, and his go-to tacos on Wednesday. As much as he appreciated his meal rotation for its efficiency, Robert couldn't shake his boredom. He wished he had the energy to try something new, but the idea of tackling unfamiliar recipes felt overwhelming—especially after long workdays.

Later that week, Robert found himself in a hotel room on a work trip, scrolling through cooking videos on his phone. His limited access to ingredients and cooking tools left him frustrated yet again. He hated relying on takeout but struggled to find recipes that worked for his situation. While watching a demonstration on one of his favorite apps, he was reminded of the gap he often faced: so many tools and resources, but none that worked seamlessly for his unique needs.

Despite the challenges, Robert continued to adapt. His resourcefulness and determination helped him stay on track, but he couldn't shake the feeling that with the right tools, meal planning could be more efficient and less draining. Perhaps it could even leave him with a bit more time to focus on the moments he valued—like a game night with friends or a relaxed dinner on a date night.

Table 5. Mirage Statement and Proposition

Persona	Problem Statement	Hypothesis Statement	Meal Maven's Value Proposition
Mirage Lake	Mirage, a non-human stakeholder lake, plays a vital role in supporting and being impacted by its human users, who prioritize quality and safe food. Mirage needs to help its human users make informed, eco-friendly shopping choices, ensuring the lake remains a thriving resource. By empowering humans to protect its waters from run-off, pollutants, and eutrophication, Mirage can remain a vibrant, accessible environment for both people and non-human life to enjoy.	If app users are provided with eco-friendly reminders and transparent information about their environmental and food quality choices, they will be empowered to make informed, sustainable decisions. This, in turn, will help preserve Mirage's waters as a thriving, healthy resource for both current and future generations to enjoy.	• Meal planner reminder to bring reusable bag on pick up day • Reminder about expiring goods • Accountability with ingredients and color coded and filterable in grocery stock app.

Mirage's Scenario

Mirage Lake sparkled under the bright Texas sun, calm on the surface but troubled underneath. This lake wasn't just water—it was life. People relied on it for drinking, growing food, controlling floods, and even enjoying themselves at its shores. But Mirage Lake carried a burden invisible to most, a quiet story of harm and resilience.

After heavy rains, runoff from nearby fields poured into the lake. The water carried silt, fertilizers, and pesticides, bringing problems with it. Fertilizers caused harmful algae to grow, turning parts of the lake into green, murky pools that hurt plants, animals, and people. Pesticides poisoned fish, making it hard for them to survive, and this poison climbed the food chain. Plastic waste, like bottles and bags, broke down into tiny pieces, getting into the soil and the plants that depended on it. Mirage Lake saw this pollution seep into the crops and livestock raised nearby.

Figure 37. Another day for Mirage.

Farmers watered their fields with the lake's water, not knowing it carried harmful chemicals. These chemicals ended up in the fruits and vegetables sold at local grocery stores, and on people's dinner plates. Shoppers thought they were eating healthy food, but Mirage Lake knew better—the contamination was invisible. The same happened with fish caught in the lake, their bodies hiding traces of the toxins from microplastics and pesticides.

Even the water people drank came with hidden risks. After storms, Mirage Lake's water treatment systems struggled to handle the heavy pollution. Some contaminants, like bisphenols (BPA) and microplastics, were too small to be filtered out. Boil notices went out to nearby communities, but many ignored them. For some, the solution was bottled water—an ironic choice, as the plastic bottles eventually returned to the lake as trash, adding to its troubles.

Mirage Lake dreamed of a future where it was clean again, supporting the plants and animals in its ecosystem. It wanted people to understand how their choices, from the farms they ran to the food they bought and the packaging they discarded, impacted the lake—and, in turn, themselves. It hoped farmers could rebuild healthy soil to stop polluted runoff, and that stores would reduce plastic use in packaging.

"Well, I'm just a lake, ain't got much to say,
But I've seen it all, day by day.
They drain me for their needs, commercial and grand,
While I watch my shores shrink, like shifting sand.

Residential lawns, oh, they're the worst,
Drinkin' up my waters, like they're dyin' of thirst.
I've got herbicides runnin' through my veins,
Plastic trash floatin' by, causin' me pains.

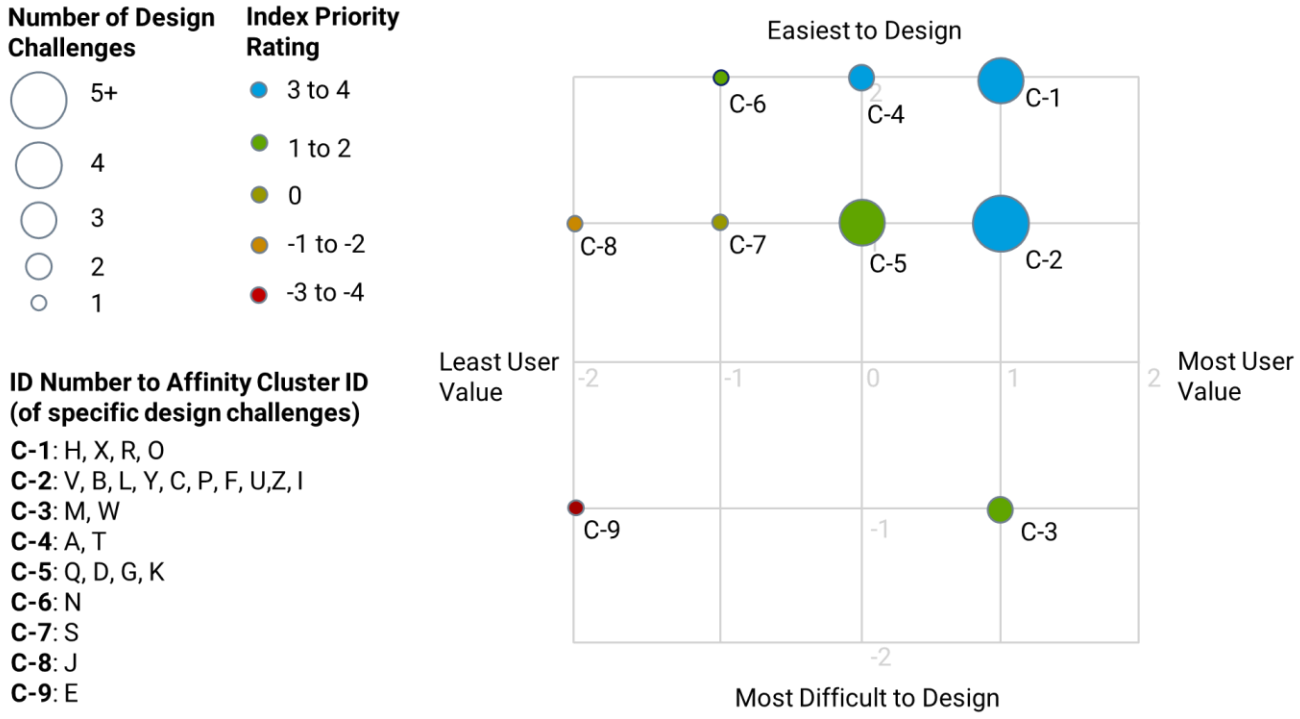
But you know, I ain't givin' up the fight,
I'll keep flowin', day and night.
So listen up, folks, from the heart of this lake,
Let's clean up our act, for goodness' sake."

And Mirage Lake wished for something practical too—something that could help consumers make better choices. A meal planning app, it imagined, could guide people toward foods with less harmful packaging or ingredients grown using sustainable practices. It could offer tips on reducing waste, ensuring seasonal produce wasn't discarded or forgotten. Mirage Lake hoped such tools could help people see the connections between their daily decisions and the health of the environment, creating ripples of positive change that would flow back to the lake, its waters, and everything it nourished. Mirage Lake couldn't speak to those who depended on it, but it hoped its story would inspire them to take action—before its calm waters turned into a silent reflection of what had been lost.

Feature Prioritization Framework

What follows are takeaways from a prioritization matrix to help the team focus on high-impact, feasible solutions, divided into quick wins (simple yet valuable enhancements) medium-term goals (features requiring moderate effort), and long-term innovation (complex, visionary features). The higher the number, the greater the value to more users and ease of design.

Figure 38. 2x2 Matrix of Design Challenge Priorities



Priority 4 (Quick Wins) Design Priorities

Brand Loyalty and Convenience

- Shopping Preferences: Users choose shops based on brand loyalty, community support, convenience, in-app features, and pick-up options. They prefer stores that carry specific foods they need.
- Human Interaction: Some users view choosing a human check-out clerk over self-checkout as a moral good, valuing human interaction.

Possible Solutions: might be allowing users to select and save multiple grocery stores based on brand loyalty, convenience, and proximity. The app might even prioritize recipes whose ingredients are available at those stores. This would allow store loyalty to be maintained and ensure a seamless shopping experience. An interactive shopping list that allows users to choose between pick-up and delivery options would accommodate different users' lifestyle and social preferences. A means to track store rewards and coupons could be integrated into the app with reminders to use them, incentivizing app usage and strengthening user

loyalty and saving the user money. The app could have a means to filter products based on locally-sourced items, sustainable options, organic items, or eco-conscious packaging. The app could also provide eco-friendly reminders when they add things to their cart, which would make social and environmentally responsible decisions easier.

Meal Planning and Preparation

- Overwhelm with Leftovers: Gathering and microwaving leftovers can feel overwhelming for some users. They resort to eating out, drive-throughs, or microwavables only when it's the most convenient option.
- One-Pot Recipes: Users prefer recipes that can be cooked in one pot to minimize dish clean-up.
- Ethical Sourcing: Users search for products that don't contain certain ingredients or are free from plastics (BPA/phthalate-free). They care about ethical sourcing of food and are frustrated by the lack of transparency in online curbside or online ordering.

Possible Solutions: The app could have a leftover rescue tool to generate recipe ideas based on leftover ingredients, which would reduce food waste, save money, and reduce mental load for the user. The app could have a calendar or planner which allows slots of time to plan on eating-out and communicating no need to prep anything for that time or day. The recipe browser could have ways to filter recipe categories to include recipes by dish load, by one-pot recipes, by time to prepare, etc, which would save users time and effort. The shopping list feature could have a tag that indicates eco-friendly, ethically source ingredients, locally sourced, or BPA-free packaging, or certain chemical ingredients (e.g., Red 40).

Quality and Accountability

- Ingredient Quality: Users feel betrayed when they get home and realize another dish has to be made from scratch because the provided ingredients (curbside or meal kit) are of poor quality. They believe mailed food kits should be accountable for reporting poor quality ingredients.
- Lack of Expression: Users feel ignored without an outlet to express when more supervision is needed for meal kits.

Possible Solution: add a “Report Ingredient Issue” in the shopping list or cart page to interface with grocery store, allowing users to flag poor-quality items (e.g., take a photo, choose issue type, or submit a claim). This would build accountability and brand loyalty.

Pantry Management

- Tracking Pantry Items: Users wish for an easy way to track their pantry. They are often dismayed when they discover they're out of an essential ingredient, throwing a wrench in their meal planning.
- Ingredient Imbalances: Users get irritated by imbalances in their pantry ingredients, like having lots of rice but no veggies. They wish for a checklist to keep track of pantry items, wondering if they still have certain spices, for example.
- Pantry Scanner: Users desire a pantry scanner that can import ingredients from grocery orders and deduct from inventory based on expiration dates or planned meal dates.
- Overordering: Users often forget to check their pantry, freezer, or fridge and end up ordering too much of something they already have, leading to waste.

Possible Solutions: Add a place to the pantry inventory page to take pictures of the pantry for the visual thinkers, or add allow multiple inputs to update the pantry with photos, bar code scans, manual entry, uploading receipts, or deducing it based on what is not added to the cart necessitated by a planned recipe. This would reduce users' mental load, save money, and reduce waste. The pantry page or shopping list recommendations page would analyze history of planned recipes and automatically predict items likely to go out-of-stock together so there aren't pantry imbalances. The recipe browser could be a slider toggle to only show suggested recipes based on what could be prepared primarily with in-stock ingredients, especially those anticipated to expire soon. The shopping list page could indicate how many items are already in-stock in the pantry so no more are ordered. Household account users can benefit from seeing and sharing the burden of updating the pantry functionality of the app. The app could also suggest in a learn more page about ways to preserve different ingredients they have in stock so it lasts longer and reduces waste.

Priority 3 (Quick Wins) Design Priorities

Awareness and Accessibility

- Missing Out on Novelty: Users feel they miss out on new or novel items displayed in-store end caps when shopping through apps. They desire features that highlight these items in online shopping platforms.
- Ingredient Awareness: Users are keen on being aware of organic, BPA, phthalates, and other plasticizer-free products, especially those on low-carb and low-sugar diets due to health concerns like diabetes and liver conditions. They want these labels or search criteria to be easily accessible in online shopping.

Recipe Preferences and Flexibility

- Simple and Quick Recipes: Users prefer recipes with few ingredients for affordability and to minimize waste. They value quick preparation, minimal equipment (like one-pot recipes), and flexibility in meal planning.
- Affordable and Flexible Recipes: Recipes that are affordable, require minimal ingredients, and can be adapted for different meals are highly favored. Users value flexibility and dependability in their meal planning.
- Health and Dietary Needs: Users consider recipes based on specific dietary needs, such as diabetes, and prefer those that are vouched for by others. They also look for recipes that inspire them and create memorable experiences.

Meal Planning and Pantry Management

- Overwhelming Choices: Users find it overwhelming to coordinate schedules, diet needs, age group needs, and eco-friendly options in meal planning. They seek easy and quick solutions.
- Pantry Inventory: Users want a system that can inventory their pantry and suggest recipes based on available ingredients, filtered by their preferences.
- Inclusive Recipes: Users care about being inclusive of family and friends' food restrictions and preferences, aiming to pick recipes that are good for everyone.
- Local and Ethical Sourcing: Users support local businesses and farmers' markets, preferring non-GMO, organic, and ethically sourced ingredients. They value the social good of supporting local friendly businesses, even if it costs more.

User Experience and Technology

- App Functionality: Users wish grocery apps would store commonly ordered items for easy recall and remember recipes to avoid reinventing the wheel each week. They also desire better security and privacy features in apps.
- Visual and Inspirational Content: Users are inspired by visual content like Pinterest and YouTube for recipe ideas. They appreciate cooking demo videos and aesthetically pleasing visuals that help them quickly decide on recipes.
- Simplified Tech Use: Some users prefer writing down lists and snapping pictures over using apps due to ease and speed. They find toggling between multiple apps cumbersome and prefer consolidated solutions.

Emotional and Sensory Experience

- Nostalgia and Connection: Users feel nostalgic and connected to their food sources, valuing personal connections with producers and the sensory experiences of shopping.
- Memorable Experiences: Users feel fulfilled when recipes make the house smell good and create memorable experiences. They enjoy discovering new items and mixing up their meal rotation with novel ingredients.

Priority 2 (Medium-Term Goals) Design Priorities

Supporting Local Producers

- Connection with Producers: Users find it fulfilling and reassuring to support local producers, making a personal connection with them. Knowing where their food comes from and that the producers take pride in their work builds trust and a sense of community.
- Garden and Market Fresh Ingredients: Users build dishes or recipes around their own garden-grown produce, novel items from farmers' markets, or unique finds at stores like Aldi's. They value knowing what's in their food and ensuring it's organic, especially for health reasons and longevity.

Seasonal and Sustainable Cooking

- Seasonal and Market Fresh Recipes: Users prefer recipes that incorporate seasonally available or market-fresh food, including hunted game. This approach aligns with their values of sustainability and freshness.
- Proportional Ingredients: Users believe that food items, ingredients, and recipes should be proportional to the number of people they are serving. This helps in reducing waste and ensuring meals are appropriately sized.

Community and Shared Meals

- Shared Dinners and Ingredient Borrowing: Users who used to cook larger meals when their kids were home now collaborate with neighbors or friends to share ingredients and dinners. This practice helps in planning meals, reducing food waste, and fostering a sense of community. It also started as a way to minimize risk during the Covid pandemic by having the healthiest person shop for everyone.

Practical Considerations

- Prominent Size Labels: Users wish for more prominent or relatable size labels on goods to make informed purchasing decisions.

- Guilt Over Food Waste: Users feel guilty when they don't get around to cooking certain items, leading to expiration and waste. This is often due to intervening situations or a lack of follow-through.

Anxiety and Security

- Food Security: Anxious users rely on having a surplus of food for a sense of security, preparing for any unforeseen circumstances. This scarcity mindset helps them feel more relaxed and secure.
- Longevity of Ingredients: Users wish for recipes that include ingredients with longer shelf lives or reminders to use certain items before they expire. This flexibility helps in managing their food supply more effectively.

Avoiding Stressful Situations

- Avoiding Crowds and Traffic: Users prefer to avoid people on the road and in stores, as they loathe inconsiderate behavior and find grocery shopping and traffic anxiety-inducing.

Priority 1 (Medium-Term Innovation) Design Priorities:

Location-Based Recipe Suggestions

- Mediterranean Food App: An app that suggests Mediterranean recipes based on what is available at local stores like Walmart or Publix. This helps users avoid the hassle of figuring out recipes in-store and provides information on how long ingredients will last.
- Remote Location Adaptability: The app should also cater to users in remote areas where the corner gas station might be the only option, suggesting recipes that can be made with limited ingredients.

Convenience and Geographic Considerations

- Time and Geographic Convenience: Users value options that are time-efficient and conveniently located along their family routes. The app should consider whether users are in town or out of town and suggest recipes based on cooking time demands and daily assessments of what can be eaten.
- AI Assistant Integration: An AI assistant connected to maps can help users plan orders based on their location, checking if nearby stores carry the items they need. This feature can be useful for planning around home, work, or while on the road.

Local Exploration and Substitution Planning

- Local Discoveries: Users regret not knowing about cool local food options. The app can highlight local healthy food stores and unique items available nearby.
- Substitution Recommendations: To support food exploration, the app should offer contingency plans with alternate ingredients if certain items, like rotisserie chickens, are unavailable. This helps users pivot easily without compromising their meal plans.

Environmental and Practical Features

- Reusable Bag Notifications: The app can send notifications before shopping trips to remind users to bring reusable bags, encouraging eco-friendly practices.
- Short-Term Meal Planning: Users typically plan meals no further out than three days, reacting to what is available in their pantry, freezer, or fridge. The app should support this

by suggesting recipes based on what needs to be used soon and incorporating reliable, flexible ingredients.

Reminders and Preparation Assistance

- Expiration Reminders: The app can help users remember to prepare or eat items before they go off, reducing food waste.
- Breakfast Preparation: Users often prepare breakfast for the next day, such as dried beans for high fiber, brown rice, veggies, and nutrient-dense potatoes. The app can provide reminders and tips for these preparations.

Priority 0 to -4 (Long-Term Innovation) Design Priorities

Addressing Food Deserts and Inclusivity

- Feeling Ignored in Food Deserts: Users feel left out when events, institutions, restaurants, and stores do not carry anything they can eat. This highlights the need for more inclusive food options in areas with limited access to diverse and dietary-specific foods.
- Personalized Grocery Experience: Just as some people go to the store for the human touch, users wish grocery stores could recognize and cater to their invisible needs, such as dietary restrictions and preferences.

Affordable Gluten-Free Alternatives

- Cost and Accessibility: Finding affordable gluten-free alternatives that do not require specialty online ordering is a significant challenge. Users are frustrated by the high costs and the need to constantly learn about new alternatives that are available to them.

Price Sensitivity and Shopping Strategies

- Price Frustration: Users get frightened and angry when they have to visit multiple stores and still can't find discounted items, forcing them to pay full price. This underscores the importance of accessible and affordable food options.
- Penny Pinching Fulfillment: Users find thrill, excitement, peace, and fulfillment in pinching pennies, especially after experiencing poverty. They take pride in finding the best deals and managing their budget effectively.

Organized and Strategic Shopping

- List Creation and Organization: Users create lists when they are out of ingredients, organized by destination. They shop around by price for the best deals, often making a circuit of stores while accomplishing other tasks.

Seeking Deals: Users actively seek clearance items, short-dated products, on-sale items, fresh foods, and diet-approved options to maximize their savings and ensure they have the necessary ingredients

Future Opportunities

The thoroughness of the studies provides rich materials for further prototyping design and marketing, here are some insights worth noting:

The chosen name for this food app (Meal Maven) is likely to most resonate with all the personas for it capturing this app's value propositions' connotations: expertise, sophistication, organization, and efficiency. Branding, from color to typography, would benefit from creating an inviting, professional, dependable, creative, and user-friendly impression. Neurodivergence was an accessibility consideration for all three personas. This means structure should be predictable and consistent, color schemes should be more limited, visual cues and imagery should be limited and muted or solid icon usage, and recipes' steps and visuals (even videos where possible) in recipe browsing and cooking modes would be highly received by all three personas. Eyesight difficulties were another accessibility concern, which means larger text, images, alt text for text-to-speech, and high contrast colors (but not garish) will be highly received by the Lisa persona.

Anthropological insights into user personas' relationships with food extend beyond the realm of meal planning app design. They offer valuable inspiration for marketers and designers, enabling them to create food-related products and services that deeply resonate with users.

Each of the personas' relationships to food are quite different, which may pose a challenge in making branding and visual design agreeable to all three. Where personality differences were not very reliable, and persona values were of limited use with family as the most noteworthy value, the personas' conceptualization of food were quite strongly characteristic of the user groups. See Table 6 for a summary of each of the personas' conceptualization of food based on cumulative studies of project.

Table 6. Persona Perception of Food

Persona	Themes to What *is* Food
Jessica	• It's time and money • It's fuel
Lisa	• It's medicine or poison. • It's a way to bond and be remembered. • It's freedom and self-reliance.
Robert	• It's survival • It's security • It's nutrition

Jessica's relationship to food highlights her focus on practicality and efficiency. Marketing to her should emphasize time-saving, budget-friendly solutions that fit seamlessly into her busy life. Jessicas are likely to respond to:

- Quick and affordable meal solutions (e.g., Dinner in 20 minutes under $10).
- Messaging that frames meal planning apps or products as tools streamline her routine and reduce her mental load (e.g., an app that combines multiple features into one place)
- Branding messaging around efficiency, dependability, and savings (e.g., dependability: "Fuel your busy days with solutions that are as reliable as you are.").

- Offering subscription services or promotions that provide tangible savings without sacrificing quality (e.g., loyalty programs offering bulk purchase discounts)

Lisa's relationship to food reflects a rich tapestry of values, blending health-consciousness with emotional and social significance. Marketing to her should:

- Emphasize the health benefits of ingredients, showcasing how food can heal or harm ("Nurture your health, one dish at a time").
- Branding should emphasize health benefits of ingredients (e.g., "nutrient-dense organic produce to revitalize your week")
- Storytelling messaging should develop narratives that connect with the emotional significant of food (e.g., video showing family bonding over a shared cooking experience) and cultural resonance with values and lifestyles (e.g., promoting eco-friendly brands that support local farms).
- Focus on food as a way to express love and create lasting memories (e.g., ads hosting events or memorable recipes for gatherings).
- Highlight self-reliance and creativity in home cooking (e.g., promoting garden-to-table recipes or DIY kits for growing fresh ingredients at home).

For Robert, food is fundamentally tied to meeting basic needs efficiently and maintaining health under practical constraints. Marketing to him should:

- Highlight simple, reliable meal solutions that guarantee nutrition and meet dietary needs without requiring extensive prep or kitchen access (e.g., one-pot recipes requiring minimal kitchen tools or preparation).
- Emphasize portability, affordability, and ease of use, especially for busy professionals or travelers (e.g., meal kits with compact packaging and single-serving sizes on-the-go or in the hotel).
- Marketers should craft campaigns that feel personal and considerate of each user's priorities, whether that's saving time, fostering connections, or ensuring security (e.g., "Nutritious meals made easy, so you can focus on what matters most").
- Include messaging around dependability and peace of mind, such as guarantees for quality and consistency in meal kits (e.g., "Our meals are crafted with your dietary needs and quality in mind").

Common to all, messaging should emphasize transparency (e.g. ingredient sourcing, quality certifications) to reinforce reliability and build trust ("Food you can count on"). Marketing should be empathetic and inclusive through acknowledging user challenges and offer tailed solutions. Marketing should also highlight how a product or service aligns with users' deeper values like sustainability, family connection, local community, or health.

Users are not stuck in one user group, also known as fluid user group dynamics. Life stage significantly impacted which user group one belongs to, and these user groups are not static, but one may behavior according to one group but progress to another one as they and their children leave home. For example, many participants remarked how they use to do one thing (describing Jessica persona habits) before adopting their current (Lisa) habits. This translates to changes in who they co-plan with, whose needs and preferences they shop for, whose schedules they may work around, what they can still eat, how much they plan at a time, how much they can eat at time, and adjustment to a user group takes time to realize and adapt to a new lifestyle. In other words, users can have evolving priorities, behaviors, and an

adjustment period. Takeaways for designers would be need to create family collaboration tools, allowing co-planning and sharing of lists, calendars and meal schedules. Designers should also ensure lifestyle-based meal plans or recipe suggestions (e.g., toddler friendly foods, school lunches, and events like children moving out). Some actionable takeaways for marketers are:

- Position artificial intelligence and data-driven tools as critical allies in assisting users through these transitions with detecting early signs of life-stage shifts (e.g., reduced order sizes, new dietary restrictions, increased interests in specialty products) and provide curated content (e.g., “Meal Planning for Empty Nesters”) aligning with emerging needs. Products should offer suggestions for pantry adjustments or recipes tailored to their changing preferences and dietary needs.
- Create empathetic marketing messaging that acknowledges life-stage transitions and normalize or even celebrate their adaptability (e.g. a testimonial campaign featuring users discussing how the app helped them through transitions).
- Build campaigns around empowering adaptation and growth with showing how a product makes navigating life’s changes easier or feature success stories with the help of a product. Educational content from blogs to videos to workshops about tackling common challenges would welcomed (e.g., “Tips for Adjusting to Cooking for Two After Kids Leave Home”).

Grocery stores are not merely transactional spaces, they are important social spaces. Grocery stores, especially during COVID provided valuable social outlets. Users do not select stores purely off competitive pricing, sometimes they are willing to pay more if the store/brand shares their values and supports their communities. Being in-store is also not just about filling a cart with goods, it’s also used as a way to spend quality time as a couple down the aisle, to helping a stranger reach an ingredient, and to see others and to be seen. Marketers can leverage this insight through:

- Develop campaigns to highlight partnerships with local businesses, farmers, or community initiatives (e.g., HEB is famous for anticipating and providing the community food in the wake of the disaster, often first on the scene before even FEMA arrives). Ensuring fresh food does not go to waste and back into the community instead of a dumpster would resonate deeply with the users.
- Incorporate signate or digital content to showcases how purchases directly help community causes, instead of just asking for check-out donations, such as showing donations to food banks or veteran’s organizations or providing a physical place to leave food for the food bank drives. Donators donations at the food bank could even be announced or cheered with a cow bell.
- Host in-store events like a charity drive or community gathers to reinforce the store’s role as a community hub.
- Create recipe sharing stations and cooking demonstrations for fostering non-transactional social interaction
- Train staff to encourage friendly engagement and to understand the store as a non-transactional environment among customers
- Highlight visibility moments with open floor plan areas with wifi and sitting, photogenic spaces for social media sharing like eye-catching seasonal displays for photos, and functional wearable branding elements that are reusable like eco-friendly bags with bold designs

- Encourage user-generated content of photos or stories of small acts of kindness in store through social media or newsletters or boards.
- Make coupon pages more than just coupons but include a marketing campaign with relatable moments while grocery shopping, like parents teaching kids about fresh produce or couples deciding on dinner ideas.
- Build loyalty programs with shared values, like allowing point or reward allocation to local causes they care about; or offering unique rewards tied to sustainable products discounts or exclusive perks for supporting local farms
- Offer recognition programs for acts of kindness (e.g. honoring customers who share meaningful moments in the store)

Based on the Phase flow discussed in the User Journey Map, Figure 40 recommends the grouping and order of usability testing tasks.

Figure 39. Tasks Recommended for Usability Testing

Deliverables

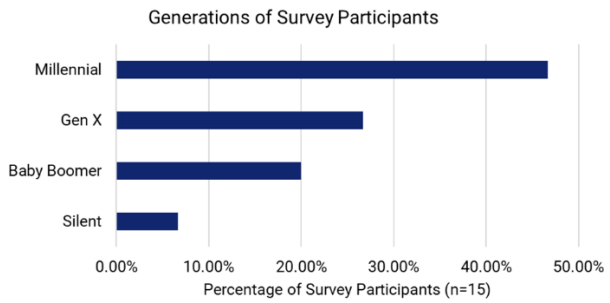
- Portfolio case study slides from the user research
- Research plan, including
- Survey questions
- Interview questions
- Spreadsheet workbooks of survey, interview, empathy maps, aggregated affinity map, and competitor data
- 4 Personas
- Include one non-human or non-user persona
- An in-depth write-up for each persona
- a single summary slide for each persona
- Problem statements for each persona
- Hypothesis statements for each persona
- Value propositions for each persona
- 1 Journey map of the primary user persona
- Competitor audit report
- Complete exploratory user experience research report

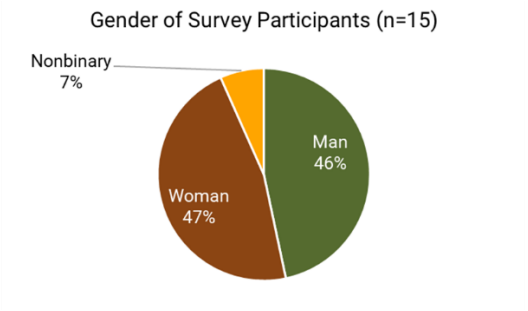
References

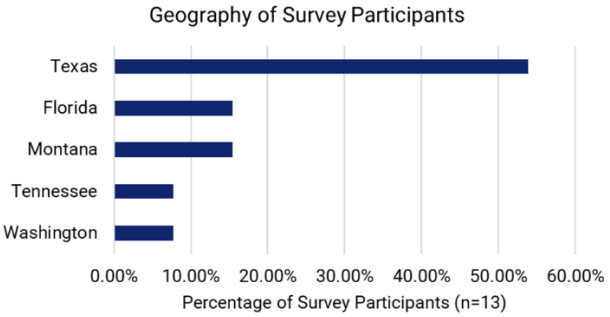
Pew Research Center, 2019. Defining generations: Where Millennials end and Generation Z begins. [online] Available at: <https://www.pewresearch.org/fact-tank/2019/01/17/where-millennials-end-and-generation-z-begins/> [Accessed 17 March 2024].

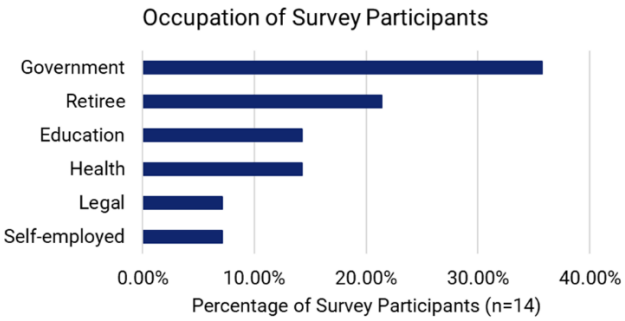
Appendix

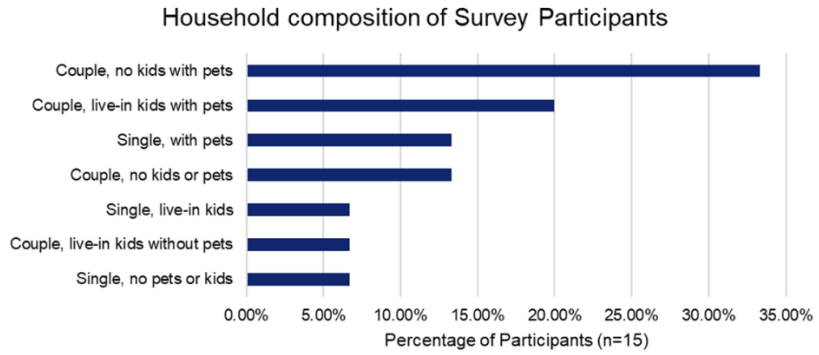
Survey Results

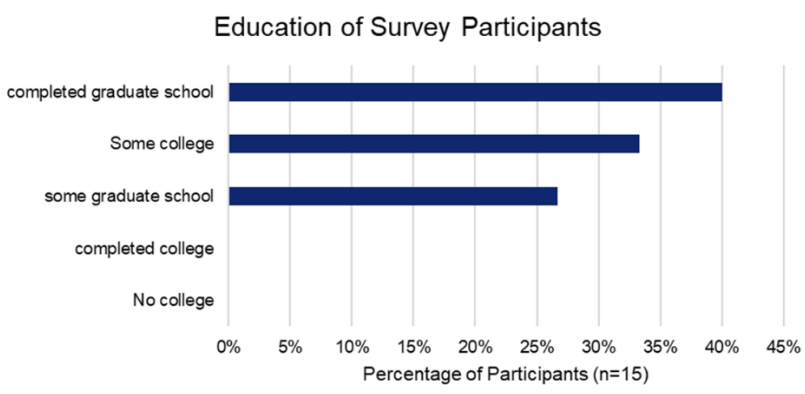












Full Persona Results

User Persona: Jessica Moore

"I'd rather find recipes that I could cook in one pot so there'd be no extra dish clean up."

Age: 39
Education: master's degree
Location: Cedar Park, TX
Occupation: Educ. Diagnostician
Family:

Home Cooked Meals:
Personally Cooks:
Food App Use:

Personality:
- Loyal
- Dedicated
- Nurturing
- Playful
- Disorganized
- Somewhat introverted

Values:
- Family
- Dependability
- Efficiency
- Respect
- Inclusivity
- Flexibility
- Growth
- Honesty
- Fairness

Weekly Meal Planning Hrs:
11 hrs ave, ~32.3% wkly free time (waking, non-work hours)

Definitive Habits:
- Parent with children at home, relies on leftovers for lunches
- Consolidates shopping and meal prepping to mostly once a week, may eat out as needed to pivot
- Prefers to grocery pick-up to save time
- Seeks mostly quick, but affordable and food sensitive options

What *is* Food?
- It's time and money
- It's fuel

Meal Planning Resources:
Chalkboard, notepad, smart phone photo album, cookbooks, Pinterest, Google searches, grocery store order apps, restaurant apps, food delivery apps, and text messages

Grocery Store Preference Rationale:
- A particular grocery store chain due to brand loyalty for the way they give back to her community, family-friendly meal kits, and quick and easy to use order pick-up app
- Geographic proximity along her typical daily route (work, daycare, and home)
- Grocery order pick-up curbside option and home delivery option available

Goals:
- Saving time and mental load, recovering time to just exist
- Quick preparation and cooking time recipe options, which work around kids events
- Shopping for staples which have flexible ingredients for pivoting for use in different recipes when too tired to use by planned date or for planned recipe
- Keeping the family's schedule and meal planning coordination for the week
- Freedom to move on routes for kids activities and between home, daycare, and work.
- Kid friendly options for lunches and snacks
- Recipes accommodating family members' food restrictions, preferences, and diets
- Stocking up when finding meal deals and 2-for-1 deals

Jessica in her natural habitat on the road and waiting for her plan to come together.

Skills and Capabilities:

- Tech savy, phone is full of various apps, including food-related apps
- Multi-tasker
- Family time-keeper
- Forgetful of remaining ingredients in pantry, fridge, or freezer
- Somewhat spatial object thinking challenged
- Online shopper over-spender

Relationships Affecting Meal Planning:

- Husband and children dietary restrictions and preferences
- Coordinating communication of order-pick up and ingredient needs with husband
- Kids' activities needing drop-offs, pick-ups, and event attendance
- Planning extra special meals for holidays

User Persona: Jessica Moore

Frustrations:

- Not enough time to just exist
- Having to reinvent the wheel each week as the grocery store app doesn't remember or offer list of staples she regularly orders to offer to pre-load her cart
- Grocery store app doesn't have a place to save her recipes that these ingredients was intended for
- Lack of consolidation of different single functionality apps and having to redundantly navigate between different apps on one phone screen is tiring with more to remember
- Lack of shared family schedule, meal plan, and shopping list in one-place to allow family to make updates together
- Knowing healthy in-screen alternatives to recipe ingredients for recipes to accommodate food restrictions, aversions, preferences, and diets of her family
- Not knowing what new or novel things are available in-store (e.g., end caps) by doing curbside pick-up.
- Boredom and need to mix up with typical recipe rotation
- Regretting not knowing what she has already in her pantry, fridge, or freezer, and potentially ordering more and over-spending on unnecessary food and causing food waste
- Misjudging the sizes of food from online pictures
- Overwhelm with app ads in the way of ingredient list

Problem Statement:

Jessica is a time-starved full-time working mom of three with full schedules and diverse dietary needs. She wants to reclaim some free time and mental load in meal planning and preparation activities, which already take a third of her free time, just to find time to "exist."

Hypothesis Statement:

If Jessica can efficiently find ways to meal plan around different scheduling and dietary demands, then she can free up time and mental load to find time to exist.

User Persona: Robert Wilson

"My food armory gives me security in the face of power outages, sharknado, or whatever."

Age: 42
Education: master's degree
Location: Ft. Lauderdale, FL
Occupation: Archaeologist
Family:

Home Cooked Meals:
Personally Cooks:
Food App Use:

Definitive Habits:
- Single person with a tight budget
- Minimalist shopping and same day food prep in which he needs something, but bulks up on food on mark-down days
- Prefers to in-store shopping for best deals, choosing quality produce, and social opportunities
- Seeks affordable and food sensitive options
- Meal planning complicated by health reasons and available cooking options and recipes when travelling for work
- Uses wide variety of apps, but food-related apps serve for grocery store coupon and rebate redemption purposes

What *is* Food?
- It's survival
- It's security
- It's nutrition

Meal Planning Resources: Notepad, coupons, YouTube, grocery store app, restaurant pick-up app, recipe search apps, cooking websites, Instagram, TikTok, and Pinterest

Personality:
- Gregarious
- Curious
- Practical
- Organized
- Detail-oriented
- Ambivert
- Agreeable
- Considerate

Values:
- Truth
- Integrity
- Autonomy
- Fairness
- Self-sufficiency
- Knowledge
- Self-control & health
- Efficiency

Weekly Meal Planning Hrs:
6.8 hrs ave, ~20% wkly free time (waking, non-work hours)

Grocery Store Preference Rationale:
- Affordability
- Stores which carry his specialty items and staples when available with reduced prices, special stickers, clearance items, and rebates or coupons are available.
- What is accessible around work or on a work trip, on occasion
- Has had to rely on food bank or on his own fishing or garden

Goals:
- Staying within budget
- Finding recipes and ingredients which meet dietary restriction needs
- Finding recipes with minimal ingredients and without much hassle to prepare and fits typical meal rotation
- Thrill of the hunt for the best value and bargain seeker, yet health food conscious, to stock up on because of future precarity
- Knowing what ingredients are in his pantry
- Finding an opportunity to help others, feel seen, and a chance to socialize with strangers at the store
- Finding recipes which have ingredients available locally to his location and options he can enjoy while on the road

Robert in his natural habitat, assessing the day's needs with the stock of his "food armament."

Skills and Capabilities:

- Tech savy, phone is full of various apps
- Neurodiverse, good spatial thinker affecting judgement of online products, fit of products in vehicle, pantry capacity, and remembering how much and what is still in-stock
- Prefers demonstration videos for cooking

Relationships Affecting Meal Planning:

- Work colleagues' impromptu lunch invitations
- Work trips sending him out of town
- Game nights
- Date nights

User Persona: Robert Wilson

Frustrations:

- Lack of one-stop-shop for his meal planning process and having to resort to so many single functionality apps
- Apps and recipe websites which don't think about
- limitations of what is locally available for ingredients
- food substitution options for dietary purposes
- recipe options when on the road or staying in a hotel
- Boredom with meal rotation, but overwhelm in terms of the learning curve needed to adopt something new into meal rotation
- Finding the best deals when they're available for his sta-

Scenario:

As a new career professional who invests a lot of time into building my craft and who travels a lot for work with a tight budget and special dietary needs, I want to be able to simply find recipes I can make without access to a full kitchen, without breaking the bank, compromising my health, and without out sacrificing precious time with a learning curve from adding something new to my meal routine. This way, I can feel secure in having what and when I need to eat, and can devote my mental energy to higher pursuits.

Problem Statement:

Robert is a new career professional who spends significant time honing his craft and frequently travels for work. With a tight budget and special dietary needs, he needs a straightforward way to find recipes he can make without access to a full kitchen—while staying within budget, maintaining his health, and minimizing the time spent adapting to new meal routines. This will allow him to feel secure about his meals and focus his mental energy on his professional growth and higher pursuits.

Hypothesis Statement:

If Robert can find affordable recipes that align with his available kitchen equipment and dietary needs, without requiring a steep learning curve, he will feel prepared and confident about his meals, allowing him to dedicate more mental energy to his professional and personal growth.

User Persona: Lisa Andersen

"I like to know where my food comes from, go for what looks good, and what's good for everyone."

Age: 60
Education: bachelor's degree
Location: Missoula, MT
Occupation: Nurse
Family:

Home Cooked Meals:
Personally Cooks:
Food App Use:

Personality:
- Creative
- Workaholic
- Down-to-earth
- Risk-adverse
- Somewhat extroverted
- Nurturing

Values:
- Family
- Self-reliance
- Dependability
- Loyalty
- Courtesy
- Health
- Nurture
- Comfort
- Quality
- Justice
- Flexibility

Weekly Meal Planning Hrs:
8.3 hrs ave, ~24.4% wkly free time (waking, non-work hrs)

Definitive Habits:
- Empty nesters, usually eat small portions and twice a day
- Shops as needed, often for the current day it is needed
- Prefers to shop in-person, for quality & value consumption
- Seeks novel, aesthetically-pleasing, healthy, DYI options
- Mostly uses food-apps as a source of recipe inspiration

What *is* Food?
- It's medicine or poison.
- It's a way to bond and be remembered.
- It's freedom and self-reliance.

Meal Planning Resources:
Chalkboard, notepad, smart phone photo album, well-illustrated cookbooks, word-of-mouth recommendations, Pinterest, and YouTube

Grocery Store Preference Rationale:
- Quality/freshness and intriguing specialty items available
- Geographic proximity to her route between work and home
- Minimal Traffic exposure
- Company is kind and respectful to employees & customers

Goals:
- Creating memories with loved-ones, using sensorially pleasing and novel foods while being inclusive of every-one's food preferences.
- Using well-liked, reliable, homemade recipes everyone will love.
- Choosing recipes around seasonally ripe produce from own garden and hunted game, or using farmer's market or World Market picks as inspiration for dishes.
- Needs flexible yet reliable ingredients that can work in a variety of seasonal dishes, prepared variously, and to avoid extra store trips.
- Occasionally grocery store shop with husband or shop at the farmer's market producers just for the social experi-ence.
- Support the local community with her consumer choices.

Lisa in her natural habitat, excited to see something new while seeking to "make a feast for her family's eyes."

Skills and Capabilities:

- Expert in her profession
- Text heavy content is hard to hard to read
- Not very tech savy
- Creative in using up pantry items
- Health consciousness, awareness of hidden ingredients and what this means for family food restrictions
- Accidental over spender when in-store

Relationships Affecting Meal Planning:

- Husband dietary restrictions and preferences
- Pets health and need for healthier ingredients, even making her own homemade pet food
- Grandchildren kid-friendly foods and food restrictions
- Holidays and visits or co-operation with the neighbors

User Persona: Lisa Andersen

Frustrations:

- Cookbooks without consistent illustrations of the finished recipe or a visualized set of ingredients
- Finding reasonably small portion sizes, having adjusted as an empty-nester and limited freezer space
- Lack of accountability from stores or food delivery services for poor ingredient quality
- Fear of missing out on rare deals, novel things, and new things, if entirely shopping online.
- Uncertainty about data privacy of apps and safety from identity theft
- High learning curves with little pay-off of learning new apps or the risk of new recipes without recommendations
- Traffic on roads and store aisles
- Easier to navigate app navigation like web-browsers
- Additives, preservatives, GMOs, and invisibility of label ingredients on some grocery store shopping apps
- Advertising obstructing recipe on recipe websites and Pinterest
- Foods waste from failure to use certain seasonal produce ingredients in some recipe, and need for inspiration of how to build a recipe around these ingredients

Problem Statement:

Lisa, an empty nester with limited tech-savviness and a preference for visual over text-heavy content, enjoys entertaining guests with novel, aesthetically pleasing dishes made from her garden vegetables. She seeks recipes that visually present ingredients and include step-by-step video instructions. This allows her to take pride in the source of her food and create memorable, visually stunning dining experiences for her guests.

Hypothesis Statement:

If Lisa has access to visually rich, user-friendly recipes that align with the ingredients available from her garden, she will feel confident in preparing inspiring, delightful dishes for her guests and take pride in the origins of her food.

Non-human User Persona: Mirage Lake

"Well, I'm just a lake, ain't got much to say,
But I've seen it all, day by day.
They drain me for their needs, commercial and grand,
While I watch my shores shrink, like shifting sand.

Residential lawns, oh, they're the worst,
Drinkin' up my waters, like they're dyin' of thirst.
I've got herbicides runnin' through my veins,
Plastic trash floatin' by, causin' me pains.

But you know, I ain't givin' up the fight,
I'll keep flowin', day and night.
So listen up, folks, from the heart of this lake,
Let's clean up our act, for goodness' sake."

Age: 60
Location: Texas
Non-human Actant Type: Water body
Relationship to Users: Direct

Definitive Habits and Capabilities: Mirage Lake is a large artificial lake or reservoir fed by a river and its basin's run off. Mirage Lake is depended on for: flood control; water supply of a large municipal area and rural communities; agricultural irrigation; hydroelectric power; environmental release for plant and wildlife; and recreation purposes.

Relation to Human Users:

- 90% of research interview participants' food shopping decisions are shaped by the perceived quality, healthiness, safety, or knowledge of where their food comes from.
- Mirage Lake directly affects the quality and safety of produce and meat provided at the local farmer's market, grocery stores, restaurants, grocery store's, and shoppers' users food and drinking water.
- Consumers are seldom are aware of their water quality, let alone the water quality of water sources used by Producers in growing their food.
- Producers may not consider how their agricultural techniques affect soil health, replenishment of water supplies, and pollutants they introduce into the water supply.
- Consumers and grocery store chains are seldom aware of how their consumption habits with its packaging or product materials are unsustainable and pollutes their own food chain and adversely affects their own health and the health of the ecosystem.

Problem Statement:
Mirage, a non-human stakeholder lake, plays a vital role in supporting and being impacted by its human users, who prioritize quality and safe food. Mirage needs to help its human users make informed, eco-friendly shopping choices, ensuring the lake remains a thriving resource. By empowering humans to protect its waters from run-off, pollutants, and eutrophication, Mirage can remain a vibrant, accessible environment for both people and non-human life to enjoy.

Hypothesis Statement:
If app users are provided with eco-friendly reminders and transparent information about their environmental and food quality choices, they will be empowered to make informed, sustainable decisions. This, in turn, will help preserve Mirage's waters as a thriving, healthy resource for both current and future generations to enjoy.

Mirage Lake choked up by a thousand thoughtless design, consumer, and disposal decisions, silently returning the favor to its imbibers.

Contaminant Sources Related to Producer, Grocery Stores, and Shoppers:

Bisphenols: from plastic food packaging, like BPA lined cans; receipts; plastic water bottles; plastic mulch from litter being mowed or leaching from landfill

Other Plasticizers: from plastic wraps; jar gaskets; grocery bags; vinyl gloves in processing; plastic water bottles; plastic mulch from litter being mowed or leaching from landfill

Fertilizers: Industrial agricultural effluence waste (ammonia nitrate) dumping, spraying, or leaching, such as commercial poultry farms and livestock feed lots; also, residential lawns**.** Industrial agricultural phosphate soil amendment run-off

Herbicides and Pesticides: Industrial agricultural monoagriculture fields and pastures, and residential lawn cumulative run-off and bioaccumulation in plant/animals.

Non-human User Persona: Mirage Lake

Goals:

- Support biodiversity and to avoid eutrophication
- Be replenishable to all users and to avoid drying up
- Be respected, transparency, and see accountability

Frustrations:

- Single-use food packaging, plastic water bottles, and plastic bags litter in the water basin or leaching microplastics, BPA, PFAS, etc. into Mirage Lake directly or carried into Mirage Lake via storm water run-off because of poor soil health.
- Upstream producer's tillage practices don't allow healthy soil to build up aggregates and roots to hold soil in place and allow water to filtered slowly and safely into Mirage Lake, causing run off of silt and pollutants
- Choked up by silt run off causing water treatment system to be ineffective after storm events and resulting in late water boil notices to drinking water community
- Run off pollutants into Mirage Lake, some of which can not be treated by water treatment center
- Commercial water waste from inefficient and leaky irrigation system and residential water waste on lawns
- Texas' really lax regulatory system makes permits easy to obtain from polluting facilities; makes it really hard to get violators fined; and hides the extent its pollutants and its visibility from the public

Contaminant Impacts to Human Users:

- Bisphenols and plasticizers are endocrine disrupters causing: diabetes, obesity, cardiovascular disease, certain cancers, birth defects, premature birth, neurodevelopmental disorders, and infertility.
- Excess fertilizer run off causes unsafe recreational use due to creating an environment for deadly algal blooms
- Herbicides and pesticides run off risks neurodevelopmental disorders, neurological disorders, and cancers.

Contaminant Impacts to Non-Human Users:

- Macroplastics are choking and trapping many animals
- Microplastics are causing animals to live shorter lives, changing the number and sex of offspring, causing slower swimming, changing genetic expression, decreasing fertility, toxic to a variety of healthy soil microbes, and bioaccumulate up the food chain to their human consumers
- Herbicides and pesticides run off can shorten the life of many species, cause developmental deformities, poison many plant and marine animal species, and injure plants.

Design Priorities Matrix Table Details

Table 7. Priority 4 Affinity Cluster Letters.

Affinity Cluster Letter	Color Coding Priority	Cluster Description	Personas	Observation
H	4	Select stores off values rationale	Jessica	Chooses shops based off brand loyalty, convienence, in-app and pick up, and carrying certain foods.
H	4	Select stores off values rationale	Jessica, Lisa	Feels fullfilled spending more money if it helps those who help the community.
H	4	Select stores off values rationale	Lisa	Views human check-out clerk choices rather than self-check out is a moral good. Consumes coffee from a company which is veeteran owned and shares his values. Able to spend extra time and money for social good.
O	4	Recipes searchable with available cooking equipment	Jessica	Feels overwhelmed when even leftovers have to be gathered and microwaved. Just eating out, drivethroughs, or microwavables are used only when convienent thing to do.
O	4	Recipes searchable with available cooking equipment	Jessica	I'd rather be able to find recipes that I could cook in one-pot, so there'd be no extra dish clean up.
R	4	Accountability and ingredient transparency, perhaps even color code items conflicting with dietary needs	Lisa, Robert, Jessica, Mirage Lake	Search available products which don't have certain ingredients or container materials made of plastics (BPA/phlate free)
R	4	Accountability and ingredient transparency, perhaps even color code items conflicting with dietary needs	Robert	Cares about ethical sourcing of food and the lack of its transparency in online curbside or online ordering
R	4	Accountability and ingredient transparency, perhaps even color code items conflicting with dietary needs	Robert, Lisa	Hates or feels disposable/beyrayed/exploited/tricked/dupped when getting home and learning another dish has to be made from scratch because the provided ingredients (curbside or meal kit) suck.
R	4	Accountability and ingredient transparency, perhaps even color code items conflicting with dietary needs	Robert, Lisa	Thinks mailed food kits should be accountabel to be able to report sad ingredients/oor quality. She's unable to express when more supervision is needed and feels ignored without any outlet.
X	4	Pantry inventory needs	Robert	Wished something could track his pantry in an easy way.
X	4	Pantry inventory needs	Robert	Dismayed by realizing by the wrench through meal planning meal rotation when discovering he's out of an essential ingredient.
X	4	Pantry inventory needs	Robert	Irritated in having imbalances in on-hand pantry ingredients, like lots of rice but no veggies. Wished he had a checlist for pantry. Do I have nutmeg still?
X	4	Pantry inventory needs	Jessica	Wishes there was a pantry scanner that you import ingredients from grocery order, and deducts from invetory based on expiration date or by planned meal date
X	4	Pantry inventory needs	Jessica	Forgets to check pantry, freezers, or fridges and orders too much of something she already has.

Table 8. Priority 3 Affinity Cluster Letters.

Affinity Cluster Letter	Color Coding Priority	Cluster Description	Personas	Observation
A	3	Awareness of new things available	Jessica	Thinks she's missing out from the new or novel things in the end caps she won't know about only on an app
B	3	Recipe search and cook book mangement for complex dietary needs (age, preferences, cook time, etc)	Robert, Mirage Lake, Jessica	Awareness of organic, BPA, phlates, other plasticizers, phosphate ingredients, especially those on low carb and low sugar diets (because of endocrine disrupters affecting diabetes, liver conditions), and seeing these labels or search criteria in online shopping
B	3	Recipe search and cook book mangement for complex dietary needs (age, preferences, cook time, etc)	Jessica	Chooses recipes around those with few ingredients (affordability, and waste reasons), quick to prepare, minimal equipment (one-pot, for clean up time saving). She values time and flexibility.
B	3	Recipe search and cook book mangement for complex dietary needs (age, preferences, cook time, etc)	Jessica	Favors recipes which are affordable with minimal ingredients, which can be mixed up in different recipes. Values flexibility and dependability.
B	3	Recipe search and cook book mangement for complex dietary needs (age, preferences, cook time, etc)	Robert	Irritated in having to relarn his body's needs and to identify what's bothering his system/body.
B	3	Recipe search and cook book mangement for complex dietary needs (age, preferences, cook time, etc)	Jessica	Feels the following things are important but overwhelming about shopping choices in meal planning: easy, quick, ability to coordinate schedules, diet needs, age group needs, and eco-friendly options.
B	3	Recipe search and cook book mangement for complex dietary needs (age, preferences, cook time, etc)	Jessica	Ability to pantry inventory to tell you what you could make with what you have and filtered by preferences
B	3	Recipe search and cook book mangement for complex dietary needs (age, preferences, cook time, etc)	Lisa	Considers recipes based on husband's diabets, his preferences, something he'd actually cook and eat if she wasn't around to do it: fresh food, veggies, meat, BBQ; recipes others have vouched for; and one's she's inspired to use a spice blend to find a dish around it and which looks, smells, and feels good and good for memory making- even heightening their anticipation.
B	3	Recipe search and cook book mangement for complex dietary needs (age, preferences, cook time, etc)	Lisa	Cares about being food inclusive for famly and friend's with their food restrictions and picky eaters
B	3	Recipe search and cook book mangement for complex dietary needs (age, preferences, cook time, etc)	Lisa	I try to pick (recipes) that's good for everyone
C	3	Connecting with local farm's market community, seasonal availabilities, and vendor search criteria for certifications	Robert, Mirage Lake, Jessica, Lisa	CSA and farmer's market ingredients search by vendors offering non-GMO/organic, vax-free, hormone-free, etc.
C	3	Connecting with local farm's market community, seasonal availabilities, and vendor search criteria for certifications	Jessica	Believes in social good of supporting a local friendly business, even if it costs more, because she likes their loyalty to the community.
C	3	Connecting with local farm's market community, seasonal availabilities, and vendor search criteria for certifications	Lisa	Feels nostolgic to make a personal connection with its producers the way her grandmother did during her ethnic delis visits and with different sights, sounds, and semlls that still inspire here today to continue making a memorable shopping and food experience.
C	3	Connecting with local farm's market community, seasonal availabilities, and vendor search criteria for certifications	Lisa	Supports those farmers' whose things they make are their jam

Table 9. Priority 3 Affinity Cluster Letters Continued.

Affinity Cluster Letter	Color Coding Priority	Cluster Description	Personas	Observation
F	3	Meal plan and recipe search app which remembers different buckets of predictable needs	Jessica	Wished grocery app would store commonly ordered items for easy recall and ordering. Maybe also remember recipes so they don't have to reinvent the wheel every week.
F	3	Meal plan and recipe search app which remembers different buckets of predictable needs	Lisa	Mental map: Mentally divides up shopping list needs into planned shopping list board; something inspiring or memorable; snacks for husbands; snacks for grandson
I	3	Family shared shopping list for meal planning	Jessica	Unconventionally uses one shared HEB account to add items to the shopping list.
I	3	Family shared shopping list for meal planning	Jessica	Unconventionally uses one shared HEB account to add items to the shopping list.
L	3	One-top-shop app that keeps saved meal plan and shopping list so you know which ingredients go with which recipes	Robert	Publix app was useful, but works only at Publix.
L	3	One-top-shop app that keeps saved meal plan and shopping list so you know which ingredients go with which recipes	Jessica	Regrets relying on HEB order to remember the recipes that go with the order, she's lost the post-check out plan of recipes lists that goes with purchased ingredients a few times. Fortunately, sometimes she can reconstruct it from text exchanges with husband.
P	3	Privacy and data trust rapport building	Jessica	Feels vunerable to too much info being shared with some apps, so security trust issues in signing up with apps.
P	3	Privacy and data trust rapport building	Lisa	Feels creeped out by Kroger's mailed recipes catalog and coupons tailored to her consumption habits, but also finds it convienent.
T	3	Adding something to meal rotation without need for thinking	Robert	Wants to learn new meals, but not ready to commit to its necessary learning curves.
T	3	Adding something to meal rotation without need for thinking	Robert	Admits to having a scarcity mindset of focusing on day's needs versus meal planning. Sees future planning a way of sacrificing the present. Wants to relax and enjoy the present and resilient/flexible efficiencies of ingredient options
T	3	Adding something to meal rotation without need for thinking	Robert	Mixes up recipes by method of cooking or uses a meal-kit. For example, produce and stir fries kits or makes a fresh meal and a bowl. Eats less processed foods.
T	3	Adding something to meal rotation without need for thinking	Robert	Food is more about nutrition. Doesn't really do much recipe research. There isn't really anything he hasn't already ried. The way he mixes things up by altering the method of preparing or cooking (stir fry, soup, salad, slow-cooked), or using certain spices (curry), or omits something (like holding the egg).
T	3	Adding something to meal rotation without need for thinking	Robert, Lisa	Bored, needs to mix up recipes with the same combo of ingredients.
T	3	Adding something to meal rotation without need for thinking	Robert	Anxious and frustrated over demands of serious and new planning with all the extra thinking it requires.
T	3	Adding something to meal rotation without need for thinking	Robert	Overwhelmed when trying a new meal with more ingredients to learn. Doesn't like to invest more time learning new meal or meal prep in gerneral. Bored with meal rotation.
T	3	Adding something to meal rotation without need for thinking	Robert	Likes to stick to what works for him in his meal rotation, so as to take thinking out of it, thought this can make things montonous. Admittedly, eats the same stuff as when a college student.
U	3	Ease of inter-app navigatability	Jessica, Robert	Annoyed by Pinterest during meal planning's ads fake recipes, scrolling by long biographies ahead of recipe ingredients list (wished it were upfront).

Table 10. Priority 3 Affinity Cluster Letters Continued.

Affinity Cluster Letter	Color Coding Priority	Cluster Description	Personas	Observation
U	3	Ease of inter-app navigatability	Robert	Confused by E-meals, couldn't figure out how to use it
U	3	Ease of inter-app navigatability	Lisa	Uses website for food subscription (food item delievery) via a website but not apps.
U	3	Ease of inter-app navigatability	Lisa	It's just quicker to write it down and snap a pic. Tech is awesome, but sometimes it takes too long for me. Takes too long to learn or go into app. It's just quicker to write it down and snap a pic.
U	3	Ease of inter-app navigatability	Lisa	Not tech savy, skeptical of tech's auto-dictation as it can't transcribe right. Set up their subscription via desktop website instead of app.
U	3	Ease of inter-app navigatability	Jessica	Irritated by having to toggle between apps (Pinterest and HEB) to prearre a list and order it.
V	3	Visuals needed for planning recipe searching and during cooking	Robert	Enjoys playing cooking-shows in background as background noise, while doing something on weekend morning routine chores
V	3	Visuals needed for planning recipe searching and during cooking	Robert	Cooking demo videos are fun, easy to use and helps him focus
V	3	Visuals needed for planning recipe searching and during cooking	Robert	Watches YouTube for fitness, health, and recipe ideas once a week to choose new recipes.
V	3	Visuals needed for planning recipe searching and during cooking	Lisa	Feels fullfilled and desired when she chooses recipes that make the house smell good and make people hungry and memorable experiences.
V	3	Visuals needed for planning recipe searching and during cooking	Robert, Lisa	Thinks videos and pictures of the recipe and its steps without need for thinking of ingredients' total (balance) and organizing, its major steps is keep for whether to choose a recipe, especially a new unvouched for recipe
V	3	Visuals needed for planning recipe searching and during cooking	Lisa	Searches Pinterest or Google for savory pot luck appetizers, refreshing summer salads, or by cooking method, but also how to the food loooks. Pinterest's visuals aesthetics helps a lot since she can't see the texts as well as she used to, and because the big pictures rapidly inspire her.
V	3	Visuals needed for planning recipe searching and during cooking	Lisa	Learns recipe ideas through watching video searches for Asian, such as Thai dishes like glazed duck. Goes by color, sound of a name, looks good to the eyes, whether she's likely to carry its ingredients, and draws inspiration from illustrated cookbooks and World Market spices blends to mix up dish ideas.
V	3	Visuals needed for planning recipe searching and during cooking	Lisa	Enjoys flipping through cookbooks and perusing World Market shelves for recipe inspiration, and Youtube cooking videos.
V	3	Visuals needed for planning recipe searching and during cooking	Lisa	Enjoys seeing what's at the store, loves novelty like artisan crackers and cheese. Embarrassed at how impulsive, randomn and expensive her hsopping visits are. Her husband fortunately does most of the shopping, but she'll go quarterly for finding something new and inspiration to mix up their meal rotation potentially.
V	3	Visuals needed for planning recipe searching and during cooking	Lisa	(When meal planning and choosing recipes) I like to go for what my stomach feels like, and what looks good to my eye balls
V	3	Visuals needed for planning recipe searching and during cooking	Lisa	I get excited when I find something new
Y	3	Meal planning recipe search ides for using up remaining ingredients	Lisa	Thinks about what she can make with the left over ingredients in another meal, or if she has left over ingredients, otherwise seeks to freeze left overs
Y	3	Meal planning recipe search ides for using up remaining ingredients	Lisa	Frustrated and guilty when something goes off before its time. Would like to know how to extend food life.
Z	3	Choosing recipes off recommendations, comments, and social network likes or recommendations	Robert	Tested recipe recommendations/ reviews would be helpful
Z	3	Choosing recipes off recommendations, comments, and social network likes or recommendations	Robert	AllRecipes was neat with its crowdsourced recipes but overwhelming to try searching. It wasn't specific enough (in its search criteria) for me. Plus, you have to evaluate who made it and why.
Z	3	Choosing recipes off recommendations, comments, and social network likes or recommendations	Jessica	Resentful and worried if she tries something new and won't like it, and because of the waste of time.
Z	3	Choosing recipes off recommendations, comments, and social network likes or recommendations	Lisa	I don't wanna waste money, food costs so much today, so I like to get my recipes from recommendations from people I know
Z	3	Choosing recipes off recommendations, comments, and social network likes or recommendations	Lisa	I like a sure thing, I don't gamble

Table 11. Priority 2 Affinity Cluster Letters

Affinity Cluster Letter	Color Coding Priority	Cluster Description	Personas	Observation
D	2	DYI/ seasonal planning recipe search choice	Lisa	It's fullfilling and reassuring to support locals, making a connection with its producers so you know where your food came from- it means they take pride in it, it's personal and it's trustworthy.
D	2	DYI/ seasonal planning recipe search choice	Lisa	Builds dishes or recipes around her own garden grown things, and something novel at the farmer's market or something weird at Aldi's.
D	2	DYI/ seasonal planning recipe search choice	Lisa	We love exotic thing in our garden (exotic tomatos). I know what's in them. I know what's in the soil .I know it's organic. I care it's organic because I've been eating chemical all my life. I want to make sure I am around longer for my granddaughter.
D	2	DYI/ seasonal planning recipe search choice	Lisa	Uses recipes around seasonally or market fresh food and mea, and hunted game in recipe planning considerations.
G	2	Greater visibility of recipe proportions and sizes of goods during online shopping	Lisa	It's too loosey goosey, time nad effort consuming for figuring out something new- especially when it's more than we need
G	2	Greater visibility of recipe proportions and sizes of goods during online shopping	Lisa	Thinks food item or ingredients, and recipes should be able to proportional to number of persons it is for
G	2	Greater visibility of recipe proportions and sizes of goods during online shopping	Lisa	Use to cook larger meals when kids were home, but now its just us (husband and I) and we don't eat as much. We'll go in with friend across the street to borrow some ingredients and sometimes shared dinners to save on planning dinners when a neighbor or friend does it one night. It helps also avoid fod waste, and something they started ever since Covid where they would assess who should take the risk to collectively shop for them all by having the healthiest go.
G	2	Greater visibility of recipe proportions and sizes of goods during online shopping	Jessica	Wished sizes of goods were more prominent or comparable to relatable things
K	2	Recipes based on pantry items shelf life and advice for preserving food for self-sufficiency concerns	Jessica	Hates and feels guilty when they didn't get around to cooking up some veggies or meat, and it expires. This is because of intervening situations or a lack of follow through.
K	2	Recipes based on pantry items shelf life and advice for preserving food for self-sufficiency concerns	Robert	As an anxious person, I rely on my food armament
K	2	Recipes based on pantry items shelf life and advice for preserving food for self-sufficiency concerns	Robert	Relaxed or a sense of security in getting a surplus for surviving whatever sharknado or what comes next (scarcity mindset).
K	2	Recipes based on pantry items shelf life and advice for preserving food for self-sufficiency concerns	Jessica	Wished recipes chosen or suggestsed had ingredients that lasted longer to afford fleixilbity or at least reminders to eat something or advice to extend its life
Q	2	Store shopping location and timing based off traffic, providing a notification of the current traffic on route and instore	Lisa	We avoid people on the road and in the store.
Q	2	Store shopping location and timing based off traffic, providing a notification of the current traffic on route and instore	Lisa	Loathes inconsiderate people at store and in traffic.
Q	2	Store shopping location and timing based off traffic, providing a notification of the current traffic on route and instore	Lisa	Anxious in grocery stores. Frustrated by traffic.

Table 12. Priority 1 Affinity Cluster Letters

Affinity Cluster Letter	Color Coding Priority	Cluster Description	Personas	Observation
M	1	Easy plug-in of shopping list to locally available stores and restaraunts comptabile with diet/taste	Robert	A helpful app would be a Mediterrean food app, which shows what he can easily make with what is available at his location (Walmart or Publix). Doesn't like in the moment (in-store) of figuring out recipes and wants to know how long it will last
M	1	Easy plug-in of shopping list to locally available stores and restaraunts comptabile with diet/taste	Robert	Sometimes in remote places, the corner gas station is all you got
M	1	Easy plug-in of shopping list to locally available stores and restaraunts comptabile with diet/taste	Jessica	Demonstrates values in choosing the most time convienent options, geographic convinenence along family routes.
M	1	Easy plug-in of shopping list to locally available stores and restaraunts comptabile with diet/taste	Robert	Considers when in town or out of town to decide what to prepare ahead based on its (cooking) time demands. Also, a daily assessment of what he can eat for the day's needs make unthawing things in advance thicky, which might cause him to eat-out or to eat-out for social reasons.
M	1	Easy plug-in of shopping list to locally available stores and restaraunts comptabile with diet/taste	Robert	Regrets not knowing cool local things where he lives. Doesn't think there are any healthy food stores where he lives.
M	1	Easy plug-in of shopping list to locally available stores and restaraunts comptabile with diet/taste	Jessica	An AI assistant connected to maps with your location on your cell phone that can help you plan orders based on what's around you and if stores carry what you are shopping for (around houes, work, or on the road, or if there are relevant upcoming events).
M	1	Easy plug-in of shopping list to locally available stores and restaraunts comptabile with diet/taste	Lisa, Robert	Chooses shops based off close geogrpahy and particular foods carried
N	1	Needs recipe search with substition advice	Robert	Thinks an obstacle to being a food explorer is when it doesn't turn out well, you have to figure out substition. Would like to contingency plan with alternate ingredients for pivoting like if all the rotisseure chickens are gone
N	1	Needs recipe search with substition advice	Robert	Jamie Oliver's app has neat recipes but many ingredients are unusual, rare, and unavailable in his aera and gave no substitution recommendations
W	1	Notification reminders for meal plan or shopping list to remember to use something and to bring your own reusable bags to avoid needless waste	Robert, Jessica, Mirage Lake	Notification before shopping to bring re-usable bags to encourage not using plastic bags or pose other forms of needless waste
W	1	Notification reminders for meal plan or shopping list to remember to use something and to bring your own reusable bags to avoid needless waste	Lisa	Doesn't do much intensive food preparation or plans, food plans are made no further out than 3 days. Reactively plans around what is available in pantry, or frozen, or what's going off soon in the fridge. Draws on a meal rotation of reliable recipes with predictable ingredients and ingredients flexible for use in a variety of recipes.
W	1	Notification reminders for meal plan or shopping list to remember to use something and to bring your own reusable bags to avoid needless waste	Robert	Forgets to prepare or eat something before it goes off. Something that helps him remember when to prepare something before when you needs it would help.
W	1	Notification reminders for meal plan or shopping list to remember to use something and to bring your own reusable bags to avoid needless waste	Robert	Prepares mostly for breakfast for the next day. Preapres dried beans in advance for high fiber and adds a brown rice or some veggies and nutritient dense potatos. He replaces meat with tofu and uses little dairy.

Table 13. Priority 0 to -3 Affinity Cluster Letters

Affinity Cluster Letter	Color Coding Priority	Cluster Description	Personas	Observation
S	0	Able to search stores carrying gluten-free alternatives	Robert	Feels ignored and left-out in a food desert when events, institution, restarants, and stores do not carry anything he can eat.
S	0	Able to search stores carrying gluten-free alternatives	Robert	Just as some go to the store for the human touch, what if the grocery store could see me and my invisible needs
S	0	Able to search stores carrying gluten-free alternatives	Robert	Frustrating to find gluten-free alternative which are not expensive or require specialty online ordering, and having to learn yet more alternatives which are available to you.
J	-1	Awareness of when and where the deals are	Robert	Gets frightened and angry when he's gone to four difference stores and can't find something on discount and has to pay full price.
J	-1	Awareness of when and where the deals are	Robert	Thrilled, excited, provocative, peace, and fullfillment in pinching pennies, after living a life of poverty.
E	-3	Can create logical mapping app route based off full shopping list over different locations	Robert	Creates a list when out of ingredients organized by destination. Shops around by price for best deals in a circuit while accomphlishing other tasks. Seeks clearance, short dated, on-sale, fresh, and foods approved by diet.