

# Homemade Cookbooks: A Recipe for Sharing

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## ABSTRACT

In this paper we contribute to the growing body of research into the use and design of technology in the kitchen. This research aims to identify opportunities for designing technologies that may augment existing cooking traditions and in particular familial recipe sharing practices. Using ethnographic techniques, we identify the *homemade cookbook* as a significant material and cultural artifact in the family kitchen. We report on findings from our study by providing descriptive accounts of various homemade cookbooks, and offer design considerations for digitally augmenting homemade cookbooks.

## Author Keywords

Cookbook; home; family; ethnography; culinary tradition; tangible interaction; interface; tangible interaction

## ACM Classification Keywords

H.5.m. Information interfaces and presentation (e.g., HCI): Miscellaneous.

## INTRODUCTION

As a basic human activity and socially important practice, there is a growing social science research interest in the cultural meanings and experiences of home cooking [e.g. 9; 15; 22; 24]. Short's [22] seminal study, for example, explored the household understanding and formation of cooking skills. Her research revealed that cooking knowledge is embedded within relationships and practices, and that cooking traditions, recipes and techniques are shared within families over time through largely informal and embodied interactions involving the senses of sight, sound, smell, taste and touch. More recently, Simmons and Chapman [24] found that the social significance of home

cooking related to themes of 'connecting to others' and continuing 'family culinary traditions'. They argued that the importance of family interaction, knowledge and culture around home cooking are often assumed and not explicitly addressed in research. Whilst, then, there has been some social science research examining the significance and practices of home cooking, there is a paucity of HCI (Human Computer Interaction) related research that investigates ways to design novel technologies to support kitchen rituals and familial cooking experiences.

A *homemade cookbook*, in which recipes are compiled and shared over time within families, is a particular and evocative example of the ways in which 'connecting to others' through food and continuing 'family culinary traditions' are mediated. The homemade cookbook mediates and embodies family history, meaning and interaction around cooking. Through a series of qualitative studies, the homemade cookbook emerged as a significant kitchen artifact. It both materially embodied and symbolically represented the cultural value of family cooking history and knowledge.

In this paper we focus on cookbooks and recipe sharing, and in particular homemade family cookbooks, with the aim of contributing to the growing body of HCI research into cooking interactions and the kitchen setting [e.g. 12; 19; 20; 26]. In particular, we aim to identify opportunities for designing social and tangible technologies that may augment existing cooking traditions and familial recipe sharing practices through designs of everyday kitchen artifacts.

We firstly overview related research and technologies that mediate or augment cookbooks and recipe sharing, and discuss this prior work within the broader HCI context to kitchen technology design. We then build on this prior work with a field study that uses ethnographic techniques to inform design. We report on findings of our study by providing descriptive accounts of participant family's homemade cookbooks, and offer design considerations for homemade cookbooks which seek to support the assembly, materiality, retention and heritage of a family recipe book.

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## TECHNOLOGY IN THE KITCHEN

Kitchens have a long history of technology design and intervention, which has traditionally involved mechanical devices and electronic appliances designed to support specific tasks. More recently, the design of smart appliances are attempting to augment domestic architectures and environments with pervasive and ambient computing. Yet, there is a paucity of research which investigates ways to introduce novel technologies designed to digitally mediate familial experiences of cooking, such as family cookbooks.

Most kitchen technologies have been designed to improve time and resource management rather than support non-utilitarian experiences such as enjoyment [1]. Instead of trying to optimize cooking, however, designers have argued that approaches should draw on ethnographic research in order to find ways to support the social richness of cooking traditions, rituals and practices [2]. Grimes and Harper [12], for example, have proposed approaches that ‘celebrate’ cooking by supporting social interaction and the experience of cooking. ‘Celebratory’ principles for kitchen designs identified include: creativity, pleasure, family connectedness, and relaxation.

Despite these calls, the dominant theme in kitchen designs is to provide cooking advice and support, in which expert knowledge and professional instruction is given to domestic cooks. Many kitchen design projects have, for example, focused on transmitting or displaying instruction or information about recipes or cooking using a range of digital interfaces. For example, the *CounterActive* project developed a computer kitchen appliance aimed at augmenting the cooking experience and the traditional cookbook using multimedia and an interactive interface projected down onto the kitchen counter [13]. A number of other design projects have developed embedded kitchen screens to provide situated text, video and audio cooking advice or instructions in order to optimize cooking processes [11; 18].

Other information-oriented designs explored the use of displays to project images of fridge contents or information such as recipes or cook top temperature onto kitchen surfaces [4]. Similarly, many design approaches aim to use technologies to provide nutritional awareness and change people’s dietary habits. Mankoff et al [17], for example, developed a nutritional awareness system that analyzed grocery receipts and made recommendations for healthier options. Chi et al [7] used RFID sensing embedded in a kitchen counter to detect food products being used in cooking and provide users with nutritional information about those ingredients on a display.

Whilst these forms of instruction or information may be helpful, they typically impose a model of information transmission that neglects the opportunities and benefits for social interaction and knowledge sharing. Some early design proposals that have sought to integrate social interaction include the *Kitchen of the Future* project, which

installed visual and audio recording technologies to capture and share cooking people’s sessions [23], and a social navigation and recommender system for finding recipes online [25]. More recent examples include a community menu-planning support system for neighbors to share information about, and ingredients in, their cupboards [14], and the *Living Cookbook* [26], which aims to promote social communication and collaboration in the kitchen through an interactive digital cookbook that allows people’s cooking experiences to be recordable and shareable.

## HOMEMADE COOKBOOKS

### Traditional Cookbooks

A cookbook is typically defined and understood as a collection of recipes that is used as a reference for cooking food. Cookbooks have a long history, serving many purposes. They have functioned as a symbol of culturally dominant and legitimate cuisine in the ancient world. They serve to share recipes more widely and thus help define food culture in the wake of the printing press. They may also act as an encyclopedia of cooking knowledge following the Renaissance and its ideals. During modernity, cookbooks became pedagogical tools and common kitchen items, written primarily for housewives and domestic servants to follow step-by-step instructions. Contemporary printed cookbooks take a diversity of forms; modeled on different historical genres, as well as new styles and formats, including new types of content such as stories or cultural commentary from the author.

Printed cookbooks, then, record and embody the crafting of food into recipes. They represent cultural practices and values, and they operate as a material communication of knowledge. Whilst cookbooks have tended, historically, to transmit institutional or expert knowledge to ordinary people who receive this wisdom regarding the cooking of food, there are examples of more democratic or participatory forms of recipe sharing [5]. Known as Community Cookbooks, and emerging in the late 19<sup>th</sup> century, are more vernacular forms of printed cookbook that are collaboratively produced within particular community groups, such as ethnic, religious or heritage groups, to document and share their specific traditions, knowledge and culture [5].

### Homemade Family Cookbooks

A homemade cookbook, in which family recipes and their histories reside and are shared amongst family members, can be considered a particular version of a community cookbook. They are more than a way to transmit information, but a vernacular artifact and material embodiment of the meaning and connection families share around food.

Over time homemade cookbooks have evolved – these collections of recipes may now include family histories and photos of family members. Homemade cookbooks may be

written in notebooks, placed in ring binders or professionally published. These serve as historical or genealogical records of culinary heritage. The recipes represent a facet of family history, and provide a means to pass along family traditions to the next generation. The family homemade cookbook may be put together by a single family member or by many family members at one time, or by multiple family members over a long period of time (e.g. generations). These cookbooks become a source and representation of cooking knowledge and heritage that is passed down from generation to generation.

Despite the significance of homemade cookbooks in mediating culinary traditions, there has been very little research in their use and design. Knowledge about homemade cookbooks tend to remain within the private confines of family homes. Similarly, there is very little research into the social history or significance of these objects and little HCI research into ways they could be mediated by computer technology.

### Online Recipe Sharing

Computing technologies help to build on the long history of recipe sharing found in traditional and printed form. Recipe sharing emerged in the earlier days of the internet through an online community collaboratively editing the USENET Cookbook. There is now a wide range of websites related to various aspects of cooking on the internet including many thousands of ‘food blogs’ or ‘cooking blogs’. [For a review of cooking blogs see 21]. One of the major developments around food and new technologies is online recipe sharing sites, which allow users to search for, download, share and review recipes online. *Foodily* ([www.foodily.com](http://www.foodily.com)) is an example of social networking platform built on top of a recipe search engine. It offers a way to search for, find and share recipes. Users may ask questions, post photos, and discover people with similar tastes (by following celebrity chefs, bloggers or cookbook authors). Users are able to find recipes by ingredient or diet type, such as gluten-free food. Other examples of commonly used recipe sharing sites are *Taste* ([www.taste.com.au](http://www.taste.com.au)), and the *Online Cookbook* ([www.online-cookbook.com](http://www.online-cookbook.com)).

### Cooking and Recipe Apps

In addition to websites and social media sites, there is a large number of cooking related apps for mobile devices. Some apps are based around ingredients, allowing users to search for recipe ideas using specific ingredients (e.g. *Sara Jenkins' New Italian Pantry* [newitalianpantry.com](http://newitalianpantry.com)), or to eliminate waste by suggesting recipes based on leftover or excess ingredients (e.g. *Love Your Leftovers* [loveyourleftovers.nsw.gov.au/](http://loveyourleftovers.nsw.gov.au/)). Other apps aim to advise novice cooks about how to make a particular dish (e.g. *Informed Chef* ([www.theinformedchef.com](http://www.theinformedchef.com)), to support meal planning for busy families (e.g. *Menu Planner* [menu-planner.com](http://menu-planner.com)), or provide assistance with measurements, weights, timing and so on (*Smart Chef Suite* [smartchef.org](http://smartchef.org)).

Other cookbook apps are designed around particular types of cuisine, dietary restrictions, or particular kitchen technologies, activities and occasions. There are also a large number of gaming apps centered on cooking; most of these are aimed at the children’s gaming market. Some, such as *Cooking Mama* ([cookingmama.com](http://cookingmama.com)), uses the touch screen interface to mimic cooking actions in the game (such as tapping to imitate chopping, slicing, or stirring).

Unsurprisingly, there has been media debate about whether recipe websites, blogs and apps, along with the rise of eBooks, will bring about the demise of the traditional printed cookbook [e.g. 8; 16]. This debate centers on the disruptive advantages of digital content over printed material. Supporters highlight the advantages of lightness and mobility of digital content over heavy cookbooks, the fact that they do not take up shelf space, and that they are often interactive, including audio or visual cues to supplement written text. However, the focus on competition between digital and physical cookbook platforms neglects their complementarity. People may rediscover cooking through websites and then follow this interest into printed cookbooks; popular bloggers find opportunities to publish their recipes in hard-copy; and popular cooking television shows such as *MasterChef* generate an increasing demand for both online and hardcopy cookbooks.

### Cookbooks – Expert Knowledge, Information Sharing

Like kitchen technology designs, cookbooks – whether hardcopy or online – are typically aimed at information transmission. That is, they are primarily concerned with the communication of knowledge between experts (such as a celebrity cook) and novice users. Similarly, whilst cooking apps incorporate more sharing functionality, they are generally still centered on information exchange, i.e., allowing the user to search for recipes – whether from a particular chef, built around a specific ingredient, or based on a particular diet – which can be used to cook a dish.

A few cooking apps extend the informational approach, by allowing the user to search, collect and create their own online cookbook of their favorite recipes (e.g. *tastebook.com*; [www.myfoodbook.com.au](http://www.myfoodbook.com.au)). These digital cookbooks can then be shared with family or friends. Other ‘smart cookbook apps’ allow users to integrate all their digital recipes and cookbooks together, creating a contained and searchable library (*Caramelized Smart Cookbooks* [www.caramelized.com](http://www.caramelized.com)); or to tag with an uploaded digital photograph of the dish (e.g. *SnapRecipe* [www.snaprecipesapp.com](http://www.snaprecipesapp.com)).

Overall, then, the primary focus of both traditional printed cookbooks and digital platforms are to allow, encourage and support information retrieval (in terms of sourcing a recipe), sometimes with the added function of sharing that recipe, as a means to cooking a meal. What is missing, however, is an account of the social processes that embody the construction and production of homemade family

cookbooks. That is, the cooking websites and apps do not reflect the social or tangible interaction generated in their construction. The passed-down recipes, the hoarding of old magazine recipes, the hand-written notes, the unreadable scrawls, the smudged fingerprints, the smear of butter on the pages, for example, all reflect elements of familial interaction which reside within the homemade cookbook. This idiosyncratic assembly and materiality creates a sense of family history and memory that is lost in the glossy pages of a traditional cookbook or the smooth surface of a digital screen.

We aim to build on these efforts to accommodate social interaction and support vernacular forms of recipe sharing within households and families. Rather than approach this area through the design and intervention of technologies, we chose to explore the sharing of recipes and cooking within families through ethnographically-based research.

**RESEARCH METHOD**

**Study Design**

In this study we build on our team’s interest in intergenerational interaction [10, 27], to explore how families select, capture, and share cooking traditions and knowledge. This is discussed through the assembly, materiality, retention and heritage of handmade cookbooks. We are interested in how this specific embodiment and representation of knowledge (e.g. handmade cookbooks) is passed between generations.

Focusing on the contexts in which interaction takes place – in this case the familial home – suggest the use of ethnographic techniques to inform design [e.g. 28]. This approach aims to produce accounts of specific social activities such as family cooking, in which the interaction between people, artifacts and environments affords opportunities for design. Our ethnographic techniques involved guided kitchen tours, observation of dishes being cooked, and discussion with families’ in-situ. This approach to informing technology innovation seeks to understand cooking practices, artifacts and experiences in order to find ways to support rather than alter existing practices.

**Method**

The study involved five intergenerational family pairs, comprised of a parent and child, or grandparent and grandchild. Participant families were selected through purposive and opportunistic procedures, based on professional and social networks of the research team. Researchers visited family homes to undertake a tour of participant’s kitchens, interview the family about their cooking habits and traditions (in particular, how cooking knowledge and skills are passed between generations) and then observe the preparation of a typical dish or meal.

During the physical technology tour [e.g. 3] of the kitchen, participants were asked to describe the kitchen space – its history and uses – as well as significant objects or artifacts

in their kitchen, outlining their origins, purposes, and usefulness (or lack thereof). Researchers then observed the pair of family members cooking a familiar or typical family dish, which was significant or important to them as a family. During and following the cooking session participants discussed their family practices, habits and traditions of cooking generally. There was specific discussion about what and how cooking knowledge and skills were exchanged between generations.

The fieldwork was recorded using two video cameras – one mobile and hand held to capture cooking processes up close, and the other static and placed to capture a wide shot of the movement interactions in the kitchen. The duration of each fieldwork session was 1-2 hours. Interview data, which we primarily draw on in this paper, was coded and analyzed using an inductive thematic approach, and then combined with observation notes and video analysis taken by the researchers. The entire set of data was analyzed as a unit to look at emerging themes and patterns, specifically with relation to the form, authorship, use and meaning associated with homemade cookbooks.

**FINDINGS**

**Homemade Family Cookbooks**

This section presents descriptive accounts of six homemade cookbooks, used by five families for recipe (table 1).

Family	Source	Producer	Format
A	websites magazines friends	Father	Printed and annotated in notebook
B	websites magazines friends	Father	Printed and handwritten in notebook
C	family magazines, friends	Mother	Handwritten, loose in plastic pocket
D1	family	Cousin	Handwritten, photocopied, spiral bound
D2	family	Grand-mother	Typed, indexed in folder
E	websites	Mother	Online, bookmarked

**Table 1. Handmade cookbooks**

The descriptions operate as independent case studies; each account discusses the presentation and structure of the particular cookbook, who made it and how it was constructed, whether it has been amended or annotated, where it is stored, and the significance of the cookbook to the family. Based upon our thematic analysis, we then outline salient features shared across these cookbooks i.e. the ways in which these objects incorporate or reflect social

relationships, shared memories, and so on. Finally we provide some design considerations for homemade cookbooks which seek to support the assembly, materiality, retention and heritage of a family recipe book.

#### Family A: Printed and annotated printed internet recipes

Family A consists of a father ("Darren" aged 65) and daughter (aged 37). The father, enjoys Italian food, so has a large number of Italian cookbooks. In addition he has a small A5 size homemade cookbook, which contains different recipes he has found through searches online, copied from other cookbooks, or given to him by friends and family (see Figure 1). This cookbook is stored in the cupboard along with the other published cookbooks.



Figure 1. Family A: a printed and annotated recipe found on the internet.

Darren often searches for new recipes online. When he finds a recipe for a particular dish of interest he downloads it, and makes variations to them, noting that:

*"Those are the variations that I find work the best ... if I want to cook something and I haven't got it in one of my books I go and Google and read probably ten or twenty examples and then make my mind up because there will be a common theme in what [they] use in their cooking ... and then when I've cooked it I make some variations and document the variations [in the cookbook]"*.

The variations are documented as handwritten notes recorded on the printed recipe. These notes may be added to or amended in subsequent cooking sessions:

*"So I'll combine two or three recipes into one... some say clams and some say prawns and other seafood, and I'll decide which seafood I'm gonna use and make notes to that effect. And if I don't like it I'll change it later."*

What is significant here is that this activity, searching, downloading, reviewing, recording and amending recipes, takes place outside the kitchen space. Darren notes:

*"[It's] definitely too hard having the internet in here. Once you start cooking, I make up my mind before I'm gonna do it. So I don't want to be you know, even to the point if I'm gonna read a cook book – which I do for a new recipe – I find that a bit of an interference. When I've learnt the recipe I can do it from memory, which is far better"*.

For Darren, the process of searching, reviewing, compiling and amending recipes largely takes place outside the kitchen sphere, and is separate from cooking activity. For him, this activity 'interferes' in the cooking process.

#### Family B: A medley of annotated recipes

Family B consisted of a father ("Martin", aged 60) and son (aged 18). The family mainly eats Asian style food. Martin was fond of a particular Asian cookbook:

*"[This cookbook] is the one that gets used the most, and my generation I wouldn't be alone in this. This book gets used over and over again, and I reckon everybody in this generation has used this book over and over again ... There isn't a dud recipe in it"*.

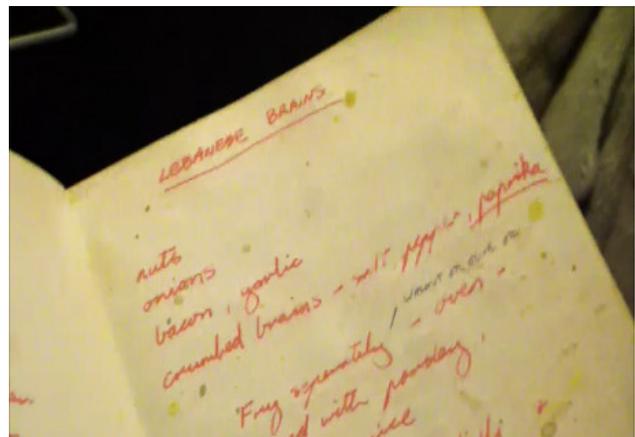


Figure 2. Family B: a handwritten recipe for Lebanese Brains covered with marks and spills.

This family also retained a homemade cookbook:

*"[It] is collection of the ones [recipes] that we like and cook frequently. Some of them are written and some ripped out, some are just things we haven't tried yet, and others are quite good. Beef vindaloo, rabbit korma, tandoori chicken, Lebanese brains – that's a good one"*.

Martin noted that some of the recipes were named after celebrities "Bert's patties, that's after Bert Newton, Bert and Pattie Newton". Others had humorous nicknames such as samosas with meat in them, which he referred to as "carnivore pancakes".

The cookbook included handwritten recipes recorded directly onto the pages, ripped out recipes which lay between pages, and occasional internet sourced recipes (see Figure 2). The recipes for this homemade cookbook

primarily originated from other books, and Martin would then adapt them to better suit his palate:

*"Like they're never hot enough, I always put more chili than they say. I'm not a very subtle cook. Like if I try cooking French it ain't gonna work. Whereas Asian style is very forgiving, I find. It's more forgiving of technique and ingredients".*

Martin sometimes collected recipes from the internet which would be added to the cookbook. Family B's cookbook was used regularly and placed in a convenient location, on a bookshelf with other cookbooks just outside the kitchen space.

**Family C: Handwritten and photocopied recipes stored in plastic pocket**

Family C consisted of a mother ("Theresa", aged 65) and daughter ("Anna", aged 32). Theresa kept a cookbook containing handwritten recipes, high up in a cupboard. This collection included a recipe of her mother's tuna bake, which was particularly prized:

*"I still have my mother's tuna bake which she wrote out for me 40 years ago; and I've still got Ni's ginger fluff and her Christmas plum pudding which I still use".*



**Figure 3. Family C: recipes kept loose in a plastic folder.**

Some of the recipes were used only occasionally, some had been photocopied (presumably to slow deterioration) and many were imbued with particular memories. For example, Theresa recounted that:

*"a lady when I was travelling wrote that out for me, for mock chicken spread that my mother used to do when I was a child because we didn't have all this tinned stuff."*

These recipes were also coveted by Anna, who expressed a wish that they would one day pass on to her: *"I hope I'm getting this [cookbook] ... it's like a connection to the past to me"*.

Particular recipes were, therefore, valued due to their age, origin or memories they evoked, having been cooked repeatedly throughout their lives. Theresa said, *"that's one, that's really old, the easy chocolate cake. That's been used and used that one"*. Anna, her daughter, remembered the

connection between this particular recipe and cooking activities in her childhood, *"that's the one we used to cook when we were kids yeah?"*.

The recipe itself was marked and 'messy'. Theresa commented: *"As you can see (by the marks) I do use those quite a bit"*. The marks and stains present on this particular recipe, therefore, reflected both the fact that the recipe was old, and that fact that it had been used many times in the past. Theresa chose to keep them in a plastic pocket (see Figure 3):

*"I keep them [the recipes] in the plastic pocket to keep them clean. So I do use those a lot, and that's why I keep them in that plastic."*

Therefore, it appears that Theresa chose to use a plastic pocket as a container for her recipes (see Figure 3). The plastic provided some protection from messiness in the cooking process, and it allowed all the recipes to be kept together in one place for safe keeping. The recipes are stored high up, in a cupboard above the stove.

**Family D: Two homemade family cookbooks**

Julie (aged 38) had two homemade family cookbooks. The first titled 'Nanas recipes' contained the grandmother's traditional or favorite recipes (see Figure 4).



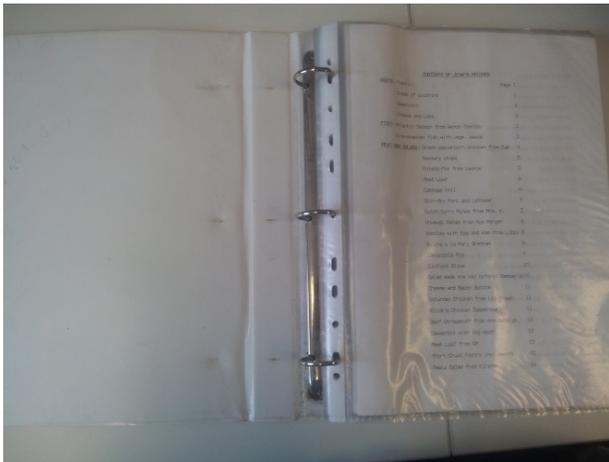
**Figure 4. Family D: 'Nana's Recipes' cookbook given to grandchildren.**

This cookbook was a record of the meals shared within the family. The grandchildren were asked individually, what their favorite Nana recipes were, and the Nana then wrote these out by hand. A cousin then compiled all the recipes, photocopied them, bound and distributed a copy to each.

Julie reported that some of these recipes she used often (e.g. lemon chicken, vegetable fitters). Other recipes she has not used at all, as they contained too much butter or fat. Julie reported that the cake, slice and biscuit recipes were used when cooking with her own children:

*"Lemon slice is a really good one to do with the kids, but it is a bit of a pain as you have to crush the biscuits with a rolling pin and a plastic bag. Interesting, because I distinctly remember doing that with my own mum when I was a kid".*

Despite the fact that she found this recipe 'really, really unhealthy' she used it for special occasions or when baking for school activities. The recipe book also included some recipes which she enjoyed, such as cheese scones, but which her children would not eat so, *"I no longer bother making them any more"*. She said that she used the book every couple of months – its use was usually initiated by her own children, when they wanted to do some cooking.



**Figure 5. Family D: A type-written recipe folder.**

The second homemade cookbook was a collection of recipes, typed on a typewriter, placed in plastic envelopes and compiled in a lever-arch folder (see Figure 5). This highly constructed cookbook, with a table of contents and index pages, was compiled by Julie's mother-in-law for her own children as *"a record of all the things she ever made [for them] while they lived at home"*. Notably it contained twice as many pages of desserts, puddings and slices as it did meat and soups, perhaps in recognition that the children enjoyed eating sweet food. This cookbook included unusual items such as 'milk formula for newborn lambs': a reflection that the recipes originated on the family farm. Many recipes had personal connotations and names e.g. 'Jeffrey's slice' was named after Jeffrey's mum who passed on the recipe. Julie said:

*"Jeffrey lives on in that recipe that everyone uses... Therefore it is a great record of the social context of recipe sharing and relationships [in the family]"*

Notably some recipes were quite messy, and stained. Julie reported that this was, *"a good indication of the recipes I use the most"* she said that she did not clean the plastic envelopes: *"The recipes that are my favorites are the ones that are sticky, with [food] splatters on them"*. She also stated that she has a memory of what particular recipes look

like, *"for example the play dough recipe has a big rip in the page. So I know exactly which one that will be"*. Julie said that this cookbook is the more important of the two – she used it more often as it provides a 'link' to her husband's family and culture.

**Family E: Compiling recipes using smart technology**

Family E does not have a paper-based homemade family cookbook. 'Dara' (aged 46), mum of two school-aged children, said that because the grandparents lived overseas they had *"lost that interaction"* with extended family. However, she was aware of the type of food that the grandparents used to enjoy eating on special occasions, such as oxtail soup, lamb shanks, jellied eels and roll mop herrings. These are not meals her family enjoys, but Dara is cognizant of the importance of food for special occasions:

*"[Even though] we don't have a special meal ... we always do something special. So my favorite dessert would be something 'chocclatty'. I love chocolate [while there are] no particular recipes handed down, toad in the hole, and Yorkshire puddings are made for special occasions"*.



**Figure 6. Family E: example of Dara's cakes posted on social media.**

Dara reported that she uses her smart TV, which is located on the kitchen wall, for researching and compiling recipes:

*"I've got these ingredients what do I make? Because that [TV] is internet based, I'll go into the taste.com website and type in sausages and mash, and it will look up something ... I'll bookmark it [my favorites] on there [smart-TV] or I'll bookmark it sometimes on my iPad if I'm watching something on the TV"*.

These electronic recipes are then used, categorized and retained for future use.

Dara makes birthday and other celebratory cakes as a hobby. She looks up cake decorating on YouTube to obtain details about a specific technique or recipe. After baking and decorating the cake, Dara takes a digital photograph of the cake and places it with others in a desktop folder while retaining annotated notes online. In addition, she often posts the photograph on social media for family and friends to view (see Figure 6). In this way Dara is compiling her own family cookbook for sharing with future generations.

## DISCUSSION

### Assembling Homemade Cookbooks

We have presented six examples of homemade cookbooks used by five families (table 1). These cookbooks are different in format and content, some are records of family recipes and others collections of found or searched recipes. The homemade cookbooks also vary in organization and structure. Nevertheless, there are common themes between them.

Firstly, each homemade cookbook constitutes a unique collection of recipes assembled over time. Some recipes were sourced offline e.g. ripped from recipe books or magazines, recorded from memory, or arising from significant events or relationships, such as an old family recipe (family D), friends or a chance meeting while travelling overseas (family C). Other recipes were downloaded from the internet and retained (family A's were printed and kept in a notebook, Family E's were retained online). Regardless of differences in recipe origins, every homemade cookbook was assembled from multiple sources, whether that was different websites, different family members, or a combination of the above.

Secondly, these homemade cookbooks may have been idiosyncratic in format, yet they all shared the common feature of being assembled into a single material artifact. Each handmade cookbook looked different through specific combinations of old hand-written recipes, clippings from magazines, images, or printouts from the internet. Some were held together in a loose and precarious fashion, whilst others were highly organized and bound with a professional appearance. Despite this diversity, they were all clearly articulated cultural and material objects. The cookbooks were retained in a way to preserve the recipes. So for example, recipes were kept together, they were placed in plastic pockets, originals were preserved (e.g., photocopied) and cookbooks were consciously stored in a 'safe' place outside the kitchen space, high up in a cupboard, or online.

Thirdly, whilst some cookbooks may have been originally produced or curated by a primary person, they were open to collaboration and amendment over time. Homemade cookbooks, then, were not static documents, but changed through the addition of recipes, annotations to existing recipes or marked with the mess of use, including food spills and thumbprints. Thus, regardless of the method of sourcing, recording, collating, formatting and using recipes

in these homemade cookbooks, each one was seen as a valuable artifact. Each homemade cookbook was a unique collection of distributed ideas and a history of recipes, assembled over time into a single material artifact, which then evolved and embodied the history of their use.

### The Retention of Recipes

The recipes in handmade cookbooks are not simply retained in a static form, but are applied, adjusted, amended and annotated over time through the process and experience of cooking. Those using the family cookbook would add annotations to recipes, usually recorded as handwritten notes in the margins of the recipe. These annotations reflected the current cookbook holder's tastes or preferences. Future generations may further add to or amend these annotations to reflect their own tastes. These annotations, then, establish further iterations of the recipe.

Some recipes were not used at all, or were abandoned. The decision to abandon a recipe was not taken lightly, and may occur for a range of reasons. Taste is one reason. The traditional food eaten by grandparents was not embraced by their modern-day grandchildren (family E). Furthermore what is deemed healthy by one generation of family (e.g. butter, sugar and cream) may be seen as unhealthy by a different generation (family D). Some recipes, such as one for milk for newborn lambs are simply no longer relevant to current family members who live in the city (family D). Yet abandoned recipes were not cut out or thrown away, but retained as part of the unique history of the cookbook.

### Embodying Materiality through Mess

Abandoned recipes were often identifiable by the fact that they were clean of stains and spills and other cooking-related mess. Conversely this places additional emphasis on the well-used or often-used messy recipes. The 'look' of the recipe embodies its use. Physical changes such as spills, torn papers, food splatters and changes in color are a reflection of its use. The messiest recipes are often the most favorite, and therefore the most valued. These recipes are often easily recognized simply because they are messy, well-thumbed, stained or ripped. This messiness is, therefore, prized. Like Julie's play dough recipe (family D), they are easily recognized by these imperfections. This makes them easy and fast to access. Cookbook holders feel sentimental about these imperfections; these may be their 'favorites', similar to an old ragged teddy bear or doll. This helps to explain why Julie (Family D) and others do not clean the plastic pockets holding the recipes.

### Homemade Cookbooks as Family Heritage

Homemade cookbooks are artifacts of family heritage, which record history, memory, and interaction. They may serve as reminders of older familial practices (such as feeding newborn lambs), they may embody an emotional connection to particular events, or serve as a reminder of a particular relationship. For many families, then, these

recipes and the stories they embody represent family history and memories. For these reasons ‘abandoned’ recipes continue to be retained amongst the other recipes in a collection.

Not every cookbook, however, is a record of family-specific recipes, with many containing recipes from other less personal sources. Yet, their significance emerges through interaction and use. As cookbooks are amended and annotated over time, they come to reveal people’s relationship to food and to record this through their handwritten marginalia. And as these homemade cookbooks are used, they record this use through a palimpsest of marks and mess that embodies the social history and significance of particular recipes. In this way, regardless of format or content, each homemade cookbook both materializes and symbolizes cooking knowledge and heritage that is shared within families.

### **A DIGITAL HOMEMADE COOKBOOK?**

The commonalities found in these homemade cookbooks provide some opportunities for the design of new technologies that extend beyond the purely informational aspects of searching for, selecting and sharing recipes. While recipe sharing can be one means of facilitating familial interaction and knowledge sharing, the current available platforms for technology-mediated cookbooks do not readily support the existing and rich practices of families in assembling, sharing and using homemade cookbooks.

Homemade cookbooks intrinsically incorporate a sense of family. They allow multiple users to search for, collect, compile, annotate and amend a collection of recipes. Many of these recipes include a sense of familial history. This history is evoked in the name of the recipe e.g. ‘Jeffrey’s slice’, in the purpose of the recipe (e.g. to feed newborn lambs), and most importantly, in the presentation of the recipe. We have noted that the messier the recipe, the more prized. This messiness and sense of familial history is missing from most digital forms of cookbook. New technologies could incorporate elements of this to better reflect the interaction, stories, and value afforded to the recipe by various family members. One example of this might be through the use of ‘digital fingerprints’. Family members who use a particular recipe could leave a digital fingerprint or trace, which would illustrate a story of use over time. If the digital fingerprints were time stamped then we could see who had last used the recipe and when, which recipes were most popular at a particular time point, and which recipes were once popular and are now out of favor.

Digital family cookbooks could include the ability for different users to record and explain stories and backgrounds to particular recipes. These recordings may take many forms, depending on the platform, device or artifact designed. So for example, designs might have an audio element embedded within a textual form which

enables the story of where the recipe came from, or how it was selected or developed, to be told by the voice of the recipe provider.

Digital homemade cookbooks could incorporate methods for annotating and amending recipes by different generations of cooks. For example, the ability to handwrite annotations to recipes using a stylus pen. Different colors, fonts, or formats may be selected to indicate individual family members (or cooks). This may provide an opportunity not only for sharing experiences of using a particular recipe to cook a dish, but will allow a story to build over time which indicates particular cooks food preferences, or choice of ingredients. These factors, in themselves, generate a story, which may be shared by future generations.

Beyond such digital design considerations, we have noted that homemade cookbooks are valued material artifacts and that their materiality is precious to families. This raises practical questions and ethical implications for designs that try to augment or replace material objects with digital technologies [6]. It is important that we maintain an awareness and sensitivity to the material and social qualities of everyday objects so that when designing digital artifacts we enhance or complement rather than disrupt or conflict these qualities. For example, rather than attempting to incorporate embodied elements into digital applications, there are opportunities for digitally enhancing or retrofitting the physical homemade cookbook artifact itself using technologies like RFID. These contrasting approaches suggests a need to sympathetically consider the relationship between and form of material-computational compositions [29], especially as ubiquitous computing and the Internet of Things offer renewed opportunities to accommodate the lives of everyday material objects into design.

### **Conclusion**

In this paper we have contributed to the growing body of HCI research in the kitchen, particularly in the area of cooking interactions. Using ethnographic techniques, we identified the homemade family cookbook as a significant material and cultural artifact in the family kitchen. We reported on findings from our study by providing descriptive accounts of participant family’s homemade cookbooks, and offered some design considerations for digitally augmenting homemade cookbooks, which seek to support the assembly, materiality, retention and heritage of a family recipe book.

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