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**Inventory of types of consumer-generated food preparation  
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## Summary

The RICHFIELDS project aims to design a Research Infrastructure (RICHFIELDS RI) for the collection, integration, processing and sharing of consumer-generated data as it relates to food behaviour and lifestyle determinants. In order to achieve this, it is necessary to explore the range of consumer-generated data currently available, in terms of its type and quality. This document reports a scoping exercise to examine the breadth of domestic food preparation apps currently available in the marketplace that collect consumer-generated data related to food preparation and create an inventory of prototypical examples of these applications. It additionally aimed to test the feasibility of applying the Quality Criteria set out in Deliverable 6.3 for the classification of apps, and other related ICT, namely descriptive, scientific, legal and technical characteristics. To this end, a search was made of UK based retailers of mobile applications, or apps. Apps arising from this search were then classified according to a set definition of domestic food preparation and a typology of available apps was created.

This report highlights the breadth of domestic food preparation apps that collect consumer-generated data currently available in the marketplace and the range of data collected by these apps. The search protocol identified a multitude of available apps. These search results were narrowed to a final list of 54 prototypical apps that represent those available in the current marketplace. These prototypical apps can be said to fulfil three main user motivations. That is, to gain 'knowledge and understanding', gain assistance with 'meal preparation and cooking', and the 'planning and organisation' of meals, foods and meal plans. Within the category of 'knowledge and understanding', the primary user behaviour was that of 'searching for information' and/or the 'sharing of knowledge and experience' with others. Many domestic food preparation apps – such as a recipe database app (e.g., Paprika Recipe manager) - provide the consumer with the ability to search for information by either within pre-determined categories (e.g., breakfast, lunch, dinner) or by entering a search term. A common feature of this category of apps is also to allow the consumer with the ability to share information with others, such as by posting to social media or emailing the information to another.

The feasibility for the application of the quality criteria set out in Deliverable 6.3 was tested, and in many cases, the level of detail necessary to fulfil these criteria was not publically available. In many cases, the specificity of these quality criteria did not afford the flexibility necessary for the sufficient categorisation of these apps according to these criteria. It is recommended that these quality criteria are reviewed in line with the finding of this exercise and the classification of consumer-generated data at an app level be reconsidered.

Legal and technical quality criteria fields were completed for apps where information was available. However, as stated above this information was not publically available in all cases. This raises an interesting ethical issue as regards the inclusion of apps and/or data into the RICHFIELDS RI where consumers do not have ready access to the terms and conditions of use. When the information was publically available, the terms and conditions were often difficult to interpret by researchers without a legal and technical background.

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## 1. Introduction

### 1.1 Background

The overall aim of RICHFIELDS is to design a Research Infrastructure for the collection, integration, processing and sharing of consumer-generated data as related to food behaviour and lifestyle determinants. The current growth in ICT technologies brings opportunities for researchers to monitor and collect information on these behaviours. It is hoped that through accessing and linking of these data-rich sources, resultant data analysis will contribute greatly towards our understanding – and ultimately management – of societal challenges regarding food and health (e.g., obesity, cardiovascular disease, sustainability).

The challenges associated with consumer-generated data go beyond the type and quality of implemented app features and include things like procedures of finding and retrieving relevant data, the methods and purposes of data collection, informed consent, confidentiality, and data ownership (Morrow et al., 2014; Hox and Boeije, 2005).

### 1.2 Aims

It was our aim to investigate the characteristics and qualities of consumer-generated food preparation data in order to learn more about its scientific relevance in regarding its potential for understanding habitual food preparation and for providing a better understanding of the determinants of food consumption behaviours. The aim of the inventory is to identify the range of available domestic food preparation applications (apps) that collect user-generated data. This document reports on the outcome of Task 6.1, an inventory of types of preparation data and data collection methodologies, including related lifestyle data. The work was conducted in parallel with inventories that focussing on food purchase (Deliverable 5.1) and food consumption (see Deliverable 7.1) report on the outcome of Tasks 5.1 and 7.1, which aimed to create parallel inventories of types of purchase and consumption data and data collection methodologies.

The inventory further aims to characterise the available domestic food preparation applications according to key research questions (i.e., What/Who/Why/How/Where). The characterisation of these apps is centred on a framework of quality criteria listed in deliverable D6.3. The apps in the inventory are therefore assessed in terms of their descriptive, scientific, legal and technical characteristics. This deliverable describes the process for the creation of the inventory and will further provide an initial characterisation of the quality of domestic food preparation apps according to the criteria set out in Deliverable D6.3

In addition, we focused on characteristics relevant for data management practices including data access and data integration. This information is important for implementing data processing strategies that rely on effective and reliable data exchange protocols. Finally, we focused on characteristics of the data relevant to its legal and ethical governance. The rights, obligations, and expectations regarding data usage are important since failure to adhere to these regulations might compromise data integrity (Loshin, 2004). In sum, in the present

research we focused on evaluating characteristics of apps, which relate to the secondary usage of data generated by regular “users” of publicly available apps, which we refer to as user-documented data. Our aim was to provide an overview of important scientific, technical, legal and ethical aspects of consumer-generated food consumption data that should inform researchers about the opportunities and challenges associated with collecting and investigating this type of data for nutrition research.

## 2. Method

### 2.1 Research Design

The presented research takes the form of a review to establish the scope of available applications relating to domestic food preparation as well as a test of feasibility – that is, the ease with which the relevant criteria can be identified - for the characterisation of these applications according to the quality criteria (Descriptive, Scientific, Legal, and Technical) detailed in Deliverable D6.3.

### 2.2 Definition of Domestic Food Preparation

Research by Stead and colleagues (2004) showed how ‘cooking’ encompasses a wide range of skills needed to feed people and includes specific elements of meal preparation (e.g. chopping, mixing, heating ingredients, understanding the language and terminology of recipes, following recipes, understanding measurements and cooking techniques) as well as knowledge of how to plan and budget for food and organise and plan meals that are acceptable to other household members. An initial search of available food preparation apps was made with the aim of identifying the variety of apps currently on the market. From this search, existing definitions of food preparation were adapted to suit the aims of this exercise. That is, to identify a set of prototypical domestic food preparation apps.

Food preparation is a multifaceted set of interconnecting behaviours that centre around the preparation of food either for one’s own consumption, or the consumption of others such as in a domestic (e.g., family) and/or commercial (e.g., restaurant) setting. For the purpose of this definition, food preparation will refer to domestic food preparation only. That is, food prepared for one’s own consumption, or that of close others (e.g., family members), in the home or other non-commercial environment.

In this instance, food preparation can be said to focus on two core skill sets; Food Skills (FS) and Cooking Skills (CS).

#### 2.2.1 Food Skills

Food skills can be defined in terms of two behavioural components. These are, Planning and Organisation behaviours, and Food Knowledge and Understanding behaviours. Both can be

considered as necessary antecedents to the mechanical preparation and/or cooking of foods (Fordyce-Voorham, 2009).

#### 2.2.1.1 Planning and Organisation

These skills are reflective of the decision-making process involved in domestic food preparation (McGowan et al., 2015). They may include behaviours such as;

- *Documenting and recording food.* Such examples would be, the making of shopping lists, or recording of expiration dates for perishable food items.
- *Meal and/or menu planning.* For example, the planning of an individual meal or a series of meals both in terms of menu choice and the timing of individual meals over varying time periods (e.g., days, weeks, months etc).
- *Recipe management.* For example, the collecting and categorising of recipes for future use.

#### 2.2.1.2 Knowledge and Understanding

These skills reflect a person's need for information relevant to intended preparation behaviour or the reflection on a previously carried out behaviour (Stead et al., 2004). Such skill may include;

- *Sharing knowledge and experience.* For example, bookmarking or favouring information within an app for the intention of future use, and/or the reading or writing of reviews and sharing of knowledge and experiences via social media.
- *Searching for information.* For example, searching for knowledge that will assist with future food preparation behaviours, such as searching recipe databases and/or understanding terminology associated with food preparation.

#### 2.2.2 Cooking Skills

These can be defined as a set of mechanical and/or physical skills used in the preparation of foods, such as chopping, mixing and heating (Short, 2003). Cooking skills also encompass perceptual and conceptual skills, such as understanding how a food will react when heated (Short, 2003). The underlying goal or motivation of this behaviour is the actual preparation of foods for consumption. Behaviours relevant to meal preparation and/ or cooking may include;

- *Using apps as cooking aids.* For example, the use of an egg timer, or digital measurement or conversion chart.
- *Interacting with sensors.* For example, the use of the 'internet of things', intelligent kitchen equipment and appliances, or sensors in the home.

## 2.3 Definition of Applications

In this exercise, applications – or apps – can be defined as software programmes developed specifically for use on small, wireless computing devices – such as a smartphone or tablet. In this instance, the search was restricted to those applications available on the IOS and/or Android platforms. Due to the volume of apps available in the marketplace, it was decided that in the first instance the search should be restricted to apps only. It is possible to apply this search protocol to the identification of prototypical examples of websites and other similar ICT technology.

## 2.4 Search Protocol

Based on the definition of domestic food preparation detailed in the above section, a protocol was devised for the identification of relevant apps. An internet-based search of the following sources was conducted of the online mobile application stores iTunes Store and Google Play. An additional search was made using the search engines Google and fnd.io. This search was restricted to UK store fronts. Additional apps were identified from reference lists of searched articles, company newsletters, and/or were kindly identified by colleagues, so as to identify apps that are not yet on the marketplace. All searches were undertaken by a single researcher based at the University of Surrey, UK and were conducted during the period April 2016 and September 2016.

An initial search of these sources was made using the search terms; food, nutrition, lifestyle and behavior\*, as this would allow for the capture of the most comprehensive range of relevant apps, and would avoid the search being restricted by pre-entered search terms or keywords. However, in order to refine the list of apps generated by these searches, a further search was made using the following terms, and their synonyms, specific to domestic food preparation: “food”, “food preparation”, “cooking”, “food production”, “diet”, “shopping list”, “food diary”, “food and drink”, “food glossary”, “meal planner”, “cooking skills”, “kitchen”, “smart kitchen device”, “dinner kit” and “smart food scale”.

The purpose of this study was to identify the scope of domestic food preparation apps available and to identify approximately 50 prototypical apps that collected consumer-generated food preparation data according to the definition set out in Section 2.2. The nature of the consumer-generated data collected by each app generated by the search was noted and a single app was identified that typified that particular consumer-generated data was included into the inventory. In addition, inclusion into the inventory was based on the inclusion and exclusion criteria detailed in the following section.



## 2.5 Inclusion and Exclusion Criteria

In order to be included in the inventory, the following criteria had to be satisfied.

Apps were included if they:

- collected consumer-generated data on domestic food preparation at a person, household and/or population level according to the definition of domestic food preparation as set out in Section 2.3;
- focused on 'wellness' as opposed to clinical and medical apps and devices.
- available for use by the wider population, i.e. not research only use;
- are currently available to users, or due to be released shortly (Beta testing);
- have sufficient information publicly available to enable the completion of the majority of inventory fields;
- were English language; and
- available for download through the UK Google Play and iTunes Stores.

Apps were excluded if they

- specifically aimed at use by children, such as games; and.
- aimed at the preparation of food for children and infants, such as breastfeeding and weaning.

The resulting list of apps was entered into the RICHFIELDS inventory management system (RIMS) for characterization, see Table 1.

## 2.6 RICHFIELDS Inventory Management System (RIMS)

A web-based data collection tool, RICHFIELDS Inventory Management System (RIMS), was built using the open source Nodejs content management system Keystonejs (version 0.3.17) as an application framework to allow for the easy characterisation of the apps. It was created in order to be able to capture the data being collected for Tasks 5.1, 6.1 and 7.1. RIMS is an online app for the management of the inventory content that was created to ensure a data collection procedure that was transparent to all parties and standardised across the three work packages of phase 1 (WP5-WP7). In brief, RIMS is an online management system for the storage and evaluation of apps (and other similar apps) that produce consumer-generated data on the purchase, preparation and consumption of food and/or beverages and their associated lifestyle data that could potentially be of use to social science researchers. RIMS comprises two component parts [1] a typology of the apps stored within the inventory, and [2] a list of quality criteria against which each app can be evaluated.

RIMS is structured into two main areas, a backend and a frontend. The purpose of the backend is to support data collection and data management about the apps identified by the three work packages of RICHFIELD's Phase 1. RIMS consists of a set of branched web forms for data input and data editing. The data characteristics of interest dictated the content and structure of the web form that supported various answering formats (widgets) including open format

text and number input fields, as well as closed format input fields with predefined and selectable answering options. The tool was designed to ensure the flexibility needed for explorative data collection, whilst also providing as much standardization as possible by making previously provided inputs and their definitions available for reuse. The tool also supports the storage of app relevant information sources (e.g., screenshots, app descriptions, etc.). The content of the web form was based on the operationalizations of the quality framework developed in Tasks 5.1, 6.1 and 7.1. The purpose of the frontend was to support data aggregations and data visualisations.

### 2.6.1 Inputs

The web form for data collection allowed for the collection of the data types numbers and text, by the use of text input fields, single selection and multiple selection fields. RIMS was also designed to allow for the management of input options used for the single and multiple selection fields (except for yes-no answering formats). This had the advantage of standardising provided inputs and making them reusable. For instance, at the start, the field which is used to collect data about the apps' implemented method for dietary assessment, contained an empty multiple selection widget in form of a drop down menu. If the first collected app used for instance "barcode scanning" as a method for dietary assessment the method was logged in a separate collection and a definition about the methods was provided. By linking that collection to the input widget, the option "Barcode scanning" became available as an alternative option within the multiple selection widget of the dietary assessment method field, and consequently, could be assigned and reused for the current and future apps collected by various researchers and work packages.

### 2.6.2 App Types

The web-form allowed for the collection of different app types, such as websites, aggregators, mobile apps (including external sensors), and desktop software. Dependent on the selected app type the input fields were adapted to fit the expected and needed information. For instance, if the app was a "mobile app" a field asking for the URL to the respective apps store where the application can be accessed, was added to the web form. If the app type was an "aggregator" the field about methods of dietary assessment was omitted from the web form.

### 2.6.3 Data types

In addition to app types, the composition of the web form was also dependent on the data type, which is whether the app collects purchase, preparation or consumption data. Specifically, each data type was associated with a different set of input fields regarding the scientific relevance of the data, which corresponds to the different sets of quality criteria identified for the three data types.

## 2.7 A typology of domestic food preparation apps

When an app is entered into RIMS, it is first categorised according to a defined typology. The typology is a scheduled framework categorising the food preparation apps according to defined grouping. The current typology for food preparation is a 4-level model (see Figure 1). The top level is the overall domain which is domestic food preparation. The second level reflects the motivation underlying the behaviour captured by the app (e.g., to gain knowledge and/or understanding). The third level reflects the specific behaviours captured by the app (e.g., searching for information). The second and third levels of this typology reflect the definition of domestic food preparation detailed in Section 2.2. The final level of the typology is indicative of the consumer-generated data collect by the selected prototypical apps (e.g., the specific search term used).

<b>Level 1:</b> What is the activity domain?	Domestic food preparation							
<b>Level 2:</b> What is the user aiming to do?	Planning & organisation (food skills)			Knowledge & understanding (food skills)		Meal preparation / cooking (cooking skills)		
<b>Level 3:</b> What is the user doing?	Documenting/ recording food	Meal/menu planning	Recipe management	Sharing knowledge & experience	Searching for information	Using apps as cooking aids	Interacting with sensors	
<b>Level 4:</b> What is the recordable user activity?	e.g. shopping lists, pantry lists, fridge contents lists, expiration dates	e.g. meal plans (including daily, weekly, monthly plans); meal choices	e.g. recipe collections; user inputted recipes	e.g. 'favouriting'; bookmarking; reviews; ratings; sharing via social media	e.g. free search of recipe database, ingredient database; glossary terms; filtered searches (inc. meal types, special diet)	e.g. setting timers, measures and conversions	e.g. 'smart' kitchen equipment and appliances	

**Figure 1.** Typology of domestic food preparation.

## 3. The Inventory Dataset

### 3.1 The Characterisation of Apps According to Typology

The apps entered into the inventory were categorised according to the devised typology. A complete list of apps in the inventory, together with their categorisations can be seen in Table 1.

The search protocol identified a multitude of available apps. These search results were narrowed to a final list of 54 prototypical apps that represent those available in the current marketplace. These prototypical apps can be said to fulfil three main user motivations. That is, to gain 'knowledge and understanding', gain assistance with 'meal preparation and cooking', and the 'planning and organisation' of meals, foods and meal plans. Within the category of 'knowledge and understanding', the primary user behaviour was that of 'searching for information' and/or the 'sharing of knowledge and experience' with others. Many domestic food preparation apps – such as a recipe database app (e.g., Paprika Recipe manager) - provide the consumer with the ability to search for information by either within pre-determined categories (e.g., breakfast, lunch, dinner) or by entering a search term. A common feature of this category of apps is also to allow the consumer with the ability to share information with others, such as by posting to social media or emailing the information to another.

Those apps which fall within the category of meal preparation and cooking, include those relating to the physical preparation of food items. In this regard, the consumer may interact with a sensor – such as 'Smart diet scales' – or use an app as a cooking aid, such as the 'Perfect Boiled Egg' which allows the consumer to enter details about their egg and preferred hardness, and in return provides the consumer with cooking instructions and timings.

Many domestic food preparation apps are also available for the 'planning and organisation' of food, meals and recipes. Prototypical apps have been included in this database that allows the consumer to manage their recipe collection, such apps may include features that allow the user to classify and 'bookmark' certain recipes for ease of future use. Many apps also include a prospective diary feature (e.g., Mealboard meal and grocery planner) that allows the consumer to plan meals within a set time frame, such as over a week or month. Other apps centre on the documenting and recording of food, these apps include those for the creation of shopping lists, pantry lists and fridge contents lists.

### 3.2 App Characterisation and Analysis

The apps entered into RIMS were characterised according to the quality criteria detailed out in Deliverable 6.3. These Quality Criteria have four main components; [1] descriptive criteria, [2] scientific criteria, [3] legal criteria and [4] technical criteria. The RIMS inventory dataset for domestic food preparation apps will be summarised and evaluated in Deliverables 6.4 and 6.5.

**Table 1.** Domestic Food Preparation Apps and their classification according to a typology of domestic food preparation.

Tool name	Knowledge & understanding		Meal Preparation & Cooking		Planning & organisation		
	Searching for information	Sharing knowledge and experience	Interacting with sensors	Using apps as cooking aids	Recipe management	Meal/menu planning	Documenting/ recording food
8500 Drink & Cocktail Recipes	X				X		
Allrecipes Dinner Spinner		X					X
AnyList		X			X		X
Avocado Meal Planner		X			X	X	
BBC Good Food	X			X	X	X	X
BigOven 350,000+ Recipes and Grocery List	X				X	X	X
Change4Life Smart Recipes	X	X			X		X
Cocktail Making							
Cook With M&S	X	X			X		
Chronometer							X
Culinary Fundamentals – Cooking School	X						
Culinary Herbs and Spices	X	X			X		
Drinks and Cocktails	X	X					
Drop Recipes	X		X				

Tool name	Knowledge & understanding		Meal Preparation & Cooking		Planning & organisation		
	Searching for information	Sharing knowledge and experience	Interacting with sensors	Using apps as cooking aids	Recipe management	Meal/menu planning	Documenting/recording food
Epicurious	X			X			X
Escali SmartConnect			X				
Fat Flush Diet Plan and Meal Tracker	X						X
Fit Men Cook – Healthy Recipes	X					X	X
Food Science 101	X						
Food Intolerances	X						
Forage – free food from the wild	X		X				X
FridgePal			X				X
Glossary of Food Science Terms	X						
Grocery List							
HelloFresh	X	X				X	X
Jamie's Recipes	X				X		X
Kitchen Calculator PRO	X			X			
Kitchen Units: Unit conversion calculator				X			

Tool name	Knowledge & understanding		Meal Preparation & Cooking		Planning & organisation		
	Searching for information	Sharing knowledge and experience	Interacting with sensors	Using apps as cooking aids	Recipe management	Meal/menu planning	Documenting/ recording food
KitchenPad Timer				X			
Let's Cook – Meal Preparation Timer				X			
LG Smart Range	X		X				
Lose It!	X	X				X	X
MealBoard Meal and Grocery Planner					X	X	X
Meal Planner Pal						X	
My Recipe Book	X	X			X		X
Oh She Glows	X				X		X
Paleo Food List	X						
Pantelligent			X				
Paprika Recipe Manager	X				X	X	X
Prep Pad for iPhone	X	X	X	X	X		
Recipe, Menu and Cooking Planner		X			X	X	
SITU Scale							X

Tool name	Knowledge & understanding		Meal Preparation & Cooking		Planning & organisation		
	Searching for information	Sharing knowledge and experience	Interacting with sensors	Using apps as cooking aids	Recipe management	Meal/menu planning	Documenting/recording food
Smart Diet Scale							X
Substitutions	X	X					
Tesco Groceries	X						
The Monash University Low FODMAP Diet	X						X
The Perfect Boiled Egg		X					
The perfect egg timer			X	X			
Time to Roast				X			
Top Chef University	X						
Vitamins Glossary	X	X			X		X
What's In My Fridge							X
Whole Foods Market	X				X		X
Yummly Recipes	X				X		X





## 4. Discussion

Task 6.1 aimed to identify the range of available domestic food preparation apps that collect user-documented data. It further aimed to characterise these apps within an inventory according to the list of quality criteria detailed in Deliverable 6.3, and in doing to test the feasibility of applying these quality criteria to domestic food preparation apps.

The available domestic food preparation apps entered into the inventory reflect the current definition of food preparation behaviour. However, it must be remembered that the definition of domestic food preparation detailed in this document is not an exhaustive one. It must further be remembered that it is the aim of RICHFIELDS to design a Research Infrastructure for the collection, integration, processing and sharing of user-documented data. In this instance, user-documented data derived from domestic food preparation apps. To this end, only apps that facilitated the *collection* of user-documented data were included in the inventory. This must be considered a limiting factor of the dataset. Many domestic food preparation apps do not simply collect user-documented data, they also provide the consumer with information, and indeed some apps only provide the consumer with information. The need for information can be said to be a major motivating factor for the use of an app in the preparation of food. Many people use apps for everyday food preparation tasks - such as timing cooking, yet in these instances, no consumer data is collected. Searching for cooking times, oven temperatures or weight conversions are all food preparation tasks for which apps are commonly available and yet no consumer data is collected by the app. These apps were therefore excluded from inclusion into the inventory. Thus researchers wishing to access this consumer-generated dataset within the RICHFIELDS RI must be cautioned that it is reflective only of certain preparation behaviours to the exclusion of others.

A further factor for consideration is that many of the apps entered into RIMS for domestic food preparation also have a food purchase and/or consumption function. These apps are detailed in Deliverables 5.1 (purchase) and Deliverable 7.1 (consumption). Again, as outlined above these apps may collect consumer-generated data on purchase and/or consumption, but provide the consumer with additional information about food preparation (such as in the form of a recipe) without collecting specific information about the consumer in the context of preparation.

As the focus of the inventory was to identify apps that had food preparation as an explicit role of social media apps in food preparation was also not thoroughly explored in this task. Common social media application, such as Facebook, Twitter and Instagram, can all be used by the consumer to share and gain information about food preparation – and indeed, food purchase and food consumption. However, the complex and disjointed nature of the consumer-generated data collected via these platforms makes it difficult to unpick the relevant data points. Thus it was decided to include only those apps designed specifically for domestic food preparation according to the definition set out in the document. It is therefore recommended that further investigation is made of the consumer-generated domestic food preparation data gathered through social media platforms.

All apps entered into RIMS were classified according to the criteria set out in Deliverable 6.3. A criterion for inclusion into the inventory was that the app provided sufficient details, so as

to facilitate the completion of the majority of these quality criteria. The decision was made that this task should only use information that was publically available. That is, not to contact the company and/or app developer for additional information beyond what could be found from either using the app, the retail store (e.g., Google Play), or an accompanying website. This was in order to test the feasibility of applying the quality criteria with only publically available information. It was found that a large proportion of domestic food preparation apps were developed by small independent app developers and therefore didn't have the same level of accompanying information as those produced by larger companies. Many apps did not have an accompanying websites or application programming interface (API, i.e. the code that allows two programmes to interact with each other) and thus access to information, such as terms and condition, was limited. Thus, in many instances, there was insufficient information to complete the majority of the fields.

Where information was available, an effort was made to complete quality criteria pertaining to the scientific, legal and technical nature of the app.

The consumer-generate data from the domestic food preparation apps presents a challenge in terms of whether the data represents an intentional or an actual behaviour. That is to say, did the person using the app use it to actually prepare a food – such as using a timer app to keep track of the cooking time – or simply intent to complete a preparation action – such as planning a recipe? Although there are definitions of food preparation behaviour, there is still much debate as to what exactly constitutes food preparation. It could be argued that both these behaviours, whether intentional or actual, represent food preparation behaviours. Thus, the categorisation of apps within a database, such as RIMS, presents a problem due to the subject nature of food preparation behaviours. Indeed, the purchase of food may be considered as an act of preparation and so many of the apps defined under purchase may, by default, also be preparation apps. The categorisation of apps within RIMS according to purchase, preparation and consumption may, therefore, be considered restrictive, and further consideration of the classification of apps according to the type of consumer-generated data collected (e.g., search data) rather than behaviour or motivation, should be considered.

Legal and technical quality criteria fields were completed in RIMS for apps where information was available. However, as stated above this information was not publically available in all cases. This raises an interesting ethical issue as regards the inclusion of apps and/or data into the RICHFIELDS RI where consumers do not have ready access to the terms and conditions of use. When the information was publically available, the terms and conditions were often difficult to interpret by researchers without a legal and technical background.

In summary, this task highlights the breadth of domestic food preparation apps that collect consumer-generated data currently available in the marketplace and the range of data collected by these apps. This was characterised by listing 54 prototypical apps within the RIMS database. The feasibility for the application of the quality criteria set out in Deliverable 6.3 was tested, and in many cases, the level of detail necessary to fulfil these criteria was not publically available. In many cases, the specificity of these quality criteria did not afford the flexibility necessary for the sufficient categorisation of these apps according to these criteria. It is recommended that these quality criteria are reviewed in line with the finding of this exercise and the classification of consumer-generated data at an app level be reconsidered.

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