Loading Legacy Repair
Data into RepairMonitor©

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1. Introduction

1.2   Background

The Centre for Sustainable Design® (CfSD) at the University for the Creative Arts (UCA) supports the Farnham Repair Café (FRC) through provision of database management support for the repair data generated by the Café. The FRC Database now holds over 3,500 repair records. The Repair Café International Foundation (RCIF) collate data from many repair cafes across the globe and their data is held in the "RepairMonitor" (RM) Tool. The RM Tool holds data for more than 100,000 repairs. RCIF have a specific objective through 2024 to improve and extend the data held in the RM tool such that it will be better able to inform policymakers and industry who are showing an increased interest in repair and the lessons learned by RCIF. The report compares the data sets held on the FRC Database with the RCIF RM Tool and considers the issues related to the transfer of data. In this respect, the document is intended to support other repair cafes by providing a case study highlighting many typical issues and challenges that a repair café may need to consider and resolve in transferring its data sets into the RM Tool.

1.2   Objective

This report has been developed to provide guidance for repair cafes that may be considering uploading existing (legacy) data into the RM tool. It has been developed by The Centre for Sustainable Design® (CfSD) at the University for the Creative Arts (UCA) in Farnham, Surrey, UK. The research is funded by UKRI via an Arts and Humanities Research Council (AHRC) Impact Acceleration Account (IAA) grant awarded to UCA. This report is supported by the experience of uploading Farnham Repair Café (FRC) data to the RCIF tool. provides a discussion of challenges identified from:

- Discussion with RCIF and representatives from UK repair cafes
- Preparation and uploading of repair data from the Farnham Repair Café (FRC) Database into the RM Tool.

1.3   Layout of this Report

This report is laid out in the following sections:

Section 1.   Introduction (this section) - provides a brief discussion of background to this report, its purpose and how it has been developed.

Section 2.   The RM tool – Notes on the RM Tool relevant to the subject of this report.

Section 3.   Purpose of Data Upload – A discussion of why it is important have clear objective(s) for loading legacy data into the RM Tool.

Section 4.   Challenges affecting data upload

Section 5.   Effort required to load legacy data into the RM Tool.

Section 6   Discussion

Section 7.   Conclusions and Recommendations

1.4   Method

Development of this report has been informed and supported by the following activities:

- An initial assessment. A review of the likely variation between the FRC and RM Tool data sets was undertaken as a first pass activity. This was undertaken to identify the correlation of fields in the FRC data set to those within the RM Tool
- A pilot upload of a range of data in the FRC Database. Data from 1000 Repairs conducted between 2020 and 2024 was uploaded into the RM Tool to uncover and investigate the specific challenges not immediately apparent by inspection during the initial assessment. A secondary reason for the upload was to support the objective of RCIF to improve and extend the data held in the RM tool as previously discussed
- Discussion with stakeholders and specialists provided clarification and further insight on the emerging findings once the initial assessment was undertaken and the pilot data upload was under way. Initial observations and impressions were shared with RCIF, a few UK repair cafes and data analyst known to the CfSD to inform the work.

1.5   Acknowledgements

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Anna Griffin   Dorking Repair Café (UK)
Trevor Davis FRSA   Trevor Davis and Associates Ltd
Ros Dean   Weymouth Repair Café (UK)

2. The RM Tool

The RM Tool holds repair data that will be familiar to many repair cafes. The most commonly occurring repair data used in the tool is summarised in a table, in the section covering the initial assessment of correlation between the two data sets – the RM tool and FRC database (see Section 4.2). The full details of the tool and its data can be obtained from RCIF, as described below.

To register on the RM tool, a repair café will first need to be recognised by RCIF as indicated on Repair Café - Fixing Together, Worldwide (repaircafe.org). Once the café is recognised by RCIF then a log-in to the RM Tool can be set up in the RM Tool site (Welcome to the RepairMonitor | RepairMonitor.org). The RM Tool website includes a User Guide[1] that explains how to upload a café's data. The RM User Guide notes that:

> "RCIF is the engine behind the worldwide successful concept of Repair Café. The foundation has been spreading this concept since 2010 and with results! Almost 1800[2] groups of volunteers organise repair café events in 35 countries. Since 2017, the RCIF has been involved in collecting data about the repairs during Repair Café events. For

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[1] Repair Monitor, User Manual. March 2020 RCIF
[2] This figure is now out of date, there are now over 3000 repair cafes worldwide. On 5th Feb 2024 RCIF reported on Instagram that: "there are now 3000 Repair Cafes in our international network. Tens of thousands of people in more than 40 countries across the globe are involved, repairing over 50,000 products every month."

this purpose, the foundation developed the RM tool, an online tool which volunteers can use to document what kind of products they repair in their Repair Café."

The following two points are considered particularly valuable to those repair cafes considering uploading legacy data into RM Tool.

1. RM Data Field limits: field size is not limited, although RCIF advise:

   "…to limit descriptions anyway to let's say max. 1 sentence for problem description and max 2 sentences for solution etc. Just to keep the data in one form and avoid spreadsheets with super long descriptions in one field".

2. Manual uploading of data is likely to be the only option in the short term. There are three key factors here:
   o RCIF have advised that adding the option to upload historical data is not currently a top priority.
   o The work conducted to develop this report has identified many instances where there is "not a close fit" between the RCIF and FRC data sets, these challenges are discussed.
   o Discussion with two software data professionals (Trevor Davis and Ros Dean) have both advised that the FRC data set represents a relatively small data set for which it is rarely economic to develop the code and algorithms necessary to convert the data.

3. Purpose of a data upload

Any repair café considering uploading data into the RM Tool needs to have clear objectives.
- One of the reasons many repair cafes use the RM Tool is to be able to show the results of their activities through a dashboard.
- Another reason may be to support the RCIF objective to improve and extend the data held in the RM tool to better inform policy-makers and industry about repair activity.

RCIF have been increasingly involved in dialogue with European government and industry, drawing on the data within the RM Tool to promote repairability. RCIF have identified shortcomings in the data and a need to add more detailed data, specifically on the nature of the failure, specific repair action and any advice given to the product owner.

Any repair café considering uploading legacy data into the RM Tool must consider how they intend to proceed in the longer term. The repair café may need to adapt their data closer to the RM Tool formats and definitions, because there is significant ongoing effort required to record two different data formats (for the individual repair café and for RCIF) and maintain this approach. Section 3.2 below includes a few questions which may help with this decision.

3.1   Purpose – The Future

Any repair café considering uploading legacy data into RM must consider how they intend to proceed in the longer term. There will significant ongoing effort required to record two different data formats e.g. for any individual repair café as well as RM and to maintain this approach. The following questions may help repair cafes decide what action to take:

- What are the differences between the individual repair café's reporting/dashboard and RM tool?
- What are the similarities and differences between their data and the data field requirements of the RM tool?
- Will the repair cafe seek to maintain periodic uploads of new/arising data into the RM tool?
- If a repair café decides to complete periodic uploads into the RM Tool, the existing data collection and management arrangements need to be considered. Will these be maintained in parallel with the RM data uploads? Can repair café volunteers sustain this effort?

4. Challenges affecting the Data Upload

Unless a Repair Café has set up its records using the RCIF Toolkit it is most unlikely that the Repair Café's data set will conform exactly to the format and content used in the RM Tool. When combined with typical data recording and transcription errors, this leads to a range of challenges to any data transfer. The typical challenges are discussed in this and should be investigated and addressed before or during any manual data upload. They would need to be addressed prior to bulk transfer of data should RCIF consider bulk data upload in the future.

Challenges affecting data upload have been identified through an initial assessment of the similarity of the two data sets, a pilot upload of a range of FRC data and discussion with the RCIF, other UK repair cafes and a data specialist known to CfSD.

4.1   Initial Assessment of Correlation between the two Data Sets

A review of the likely variation between data sets was undertaken as a first pass activity. This showed that FRC had reasonable coverage of data fields that were mandatory for repair records in the RM Tool. Observations from this initial review are highlighted in the table below.

The observations below are based upon the initial assessment of correlation between the two data sets, pilot upload of a range of FRC data and discussion with other UK repair cafes:

- Data fields are not a 1: 1 relationship
- Accuracy of Reporting
- Product Description and Taxonomy,
- Alignment with Lookups in the RM Tool

Figure 1: Comparison of FRC and RepairMonitor Tool data fields

FRC Data	RepairMonitor Data
Date	Date of Repair
Type of Product	Kind of Product
Manufacturer	Brand
Repair problem	Problem Description + probable cause
Repair Diagnosis	Defect Found
Completion	Has the product been repaired (Yes, half and or advice given, No) (1)
Repair solution	Conditional on response to "Completion" flag:
	What did you do to repair it?
	Why could you not repair it? Use RM pull down list
	What did you do, what advice did you give?
Repairer	Repairer
Category	Category (1)
Not covered by FRC Data (2)	**RepMonitor**
	(Estimated) Year of production
	Model, type number and/or serial number
	Repairability of product (1-10 scale)
	Did you use repair information (yes, no couldn't find, no didn't look)
(Notes)	
1	Not an exact 1:1 match of categories, uses RM Pull down list
2	The RCIF data not covered by FRC are all optional fields (i.e. not required in order to load data)

The above items are expanded below.

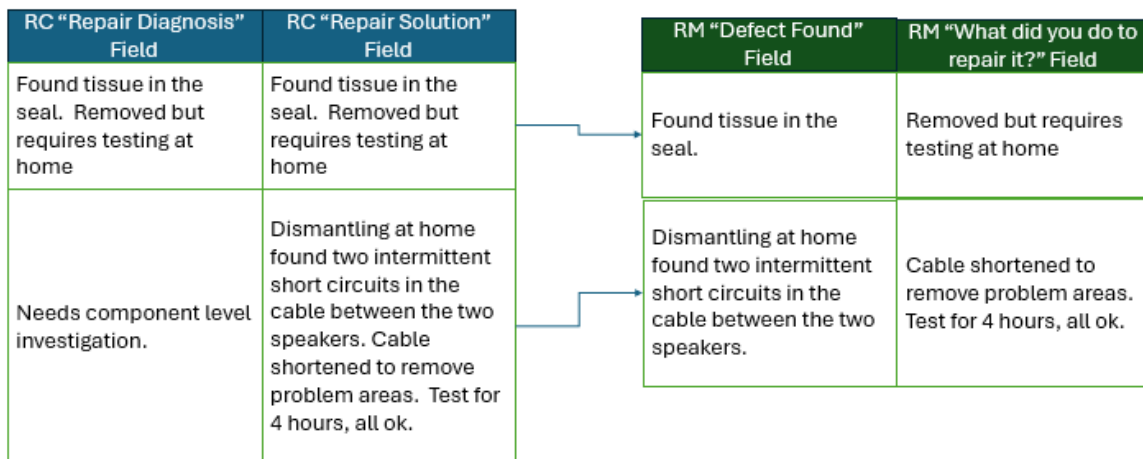## 4.2   Data Fields not a 1:1 Relationship

The initial general correlation between the two data sets suggested that fields were largely translatable from FRC data into RM Tool data. The pilot upload identified that this was not true. In several cases, the FRC "Repair Solution" field contained information that would need to be split to populate the "Defect Found" and "What did you do to repair it?" fields in the RM Tool. Two examples are shown in the table below:

4.2.1 Accuracy of Reporting

Key challenges included items misclassification of product as to where repaired or not appeared e.g. misspelling, leading to a lack of clarity of the repair action and many versions of the spelling of products and manufacturer names.

A repair café needs to decide whether to simply transfer data from their data set to the RM Tool with errors or whether to complete data review and correction. The FRC pilot followed the latter route to maximise value for RCIF. Corrections were made to the FRC data due to the overriding objective of improving the quality (rather than simply quantity) of data in the RM Tool.

Figure 2: Example of data fields not in a 1:1 relationship

RC "Repair Diagnosis" Field	RC "Repair Solution" Field		RM "Defect Found" Field	RM "What did you do to repair it?" Field
Found tissue in the seal. Removed but requires testing at home	Found tissue in the seal. Removed but requires testing at home	→	Found tissue in the seal.	Removed but requires testing at home
Needs component level investigation.	Dismantling at home found two intermittent short circuits in the cable between the two speakers. Cable shortened to remove problem areas. Test for 4 hours, all ok.	→	Dismantling at home found two intermittent short circuits in the cable between the two speakers.	Cable shortened to remove problem areas. Test for 4 hours, all ok.

However, not correcting data is a simpler option. Bulk upload of data would involve the use of a software routine or application to import tabular data into the RM Tool database. Microsoft spreadsheets or google sheets are typically used by repair cafes to store their data and these could be used for bulk upload of the whole data set in a single operation. However, correction of the data would most likely not be undertaken by this software routine or application as it would need to address all of the challenges identified in this work. This would require considerable software development effort and would most likely need to include a significant "learning" period by the software routine/application in order that it fully address the full range of data challenges.

Considerable updates to the FRC data set were required as part of the pilot load. The data is inputted by volunteers with limited review of data accuracy at each session. The FRC database is a result of manual transcription of repair entries from paper forms into a MS Excel workbook. It is only natural that issues were found with accuracy of the data. These issues may be split into:

- Definitions for field contents, different repairers have different interpretations of repair details, see discussion below,
- Errors in the data. Most data fields in the FRC repair record forms are free entry text and are completed manually during a FRC session and then input into the FRC Database after each session. It is recognised by FRC that the existing data entry approach has led to several data errors in the FRC Database.

4.2.2 Definitions for field contents

There can be different interpretations by repairers of what is expected in any given data field. One example is what constitutes a successful repair?

Repair Cafes may report this in different categories to those used by the RM Tool. The difference between the FRC and RM Tool data fields for potential repair outcomes is shown in Figure 3 below.

ID	FRC repair outcome categories	RM Tool repair outcome categories
1	Completed	Product Repaired
2	Partial	Half and/or advice given
3	Advice given	
4	Not possible	Not repaired

In some instances in the data, it appears that the item was indeed working when brought to the repair café but the owner/user didn't fully understand how to operate it. Different repairers have recorded these events as either Completed, Partial or Advice given. While repair cafes may provide guidance there is no standard classification used to define repair activities of this nature. It is considered that such a standard classification would likely be too onerous to manage for volunteer run organisations, but some guidance might be better than none. This is an area that could be reviewed by RCIF and repair cafes.

4.2.3 Errors in the Data

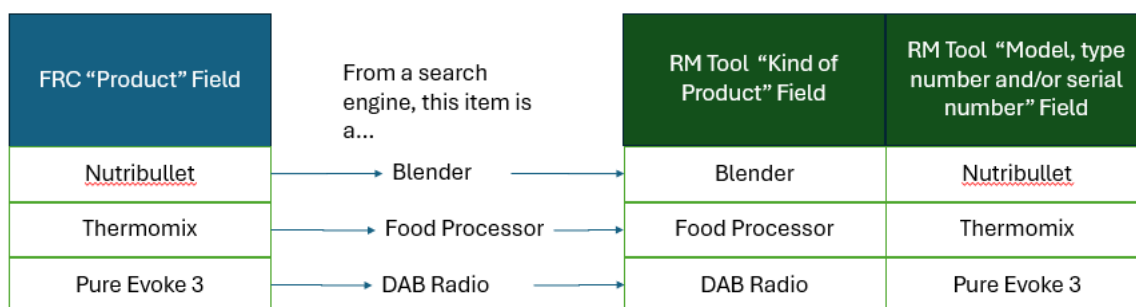Typical errors in the FRC data include:

- Misspelling in diagnosis and repair text leading to unclear statements, e.g. where the reported fault on a radio has been recorded as "Turning buttons display but don't move". The fault has been revised to read ""Tuning buttons display but don't move".
- Many different descriptions of similar versions of equipment and product details, e.g. blow lamp and blow torch. These were corrected, before and during the data upload. An initial pass through the FRC data identified several instances of such errors, but then further examples emerged during the data upload. Corrections typically involved searching and changing entry details in the FRC Database to a single item description for several similar product types. For example, the records corrected to read Dualit for various entry spellings for the manufacturer Dualit including Duallit, Dual it, Dualitt, etc.

4.3   Product Description and Taxonomy

All problems with source repair café data should be resolved before loading into the RM Tool to avoid poor, incorrect or misleading data being loaded. However, some problems may not stand out by inspection making it difficult to resolve prior to attempting to load the data.

The FRC data contained many cases of a model name being used to describe the product type; this is relatively common for well-known items. Therefore, it is a challenge that is best dealt with as it becomes apparent as you upload the data. In the FRC pilot data upload, "product" data in the FRC data required revision in around 3-4% of entries. This challenge would need to be corrected before upload should bulk upload be undertaken. Revision of entries during upload of the data would not be an option and would therefore need detailed review and update prior to upload. Examples of "Product" data revisions from the FRC data include:

Figure 4: Example of product description errors

FRC "Product" Field	From a search engine, this item is a...	RM Tool "Kind of Product" Field	RM Tool "Model, type number and/or serial number" Field
Nutribullet	→ Blender →	Blender	Nutribullet
Thermomix	→ Food Processor →	Food Processor	Thermomix
Pure Evoke 3	→ DAB Radio →	DAB Radio	Pure Evoke 3

4.4 Alignment with Lookups in the RM Tool

FRC data is initially handwritten onto paper forms and then specific data items are periodically entered into an MS Excel database. A recent survey of UK repair cafes[3] suggests that this is a common approach and suits many repair cafes. The approach is flexible and tangible, in that the item for repair and form are handed to repairers. Discussion with other repair cafes would suggest that repairers like the simplicity and flexibility of a paper-based system. Although UK repair cafes are experimenting with automated systems.

Some of problems associated with paper-based process include the legibility of entry onto a paper form. Also, paper forms do not have the function available in software forms to raise a flag if a data field is not completed by the repairer. Furthermore, the paper form detail can be misread when subsequently inputting into the spreadsheet. Such errors may have occurred in around 1-3 percent of cases in the FRC data. It could be very time consuming trying to resolve these issues, so the approaches detailed below were adopted for Brand, Kind of Product and Reason for non-repair.

Many repair cafes are entering their data into a database type tool directly at the event. However, there are a whole range of other issues associated with direct entry of repair data using such software applications on a tablet or smart phone. These can include (and are certainly not limited to): misreading the form or entry on a small screen, the use by a repairer of the first option from a pull-down list to save time, typing errors are still common, and autocorrection often introduces unintended words. The design and implementation of any such data entry application should be undertaken with great care and use key human factors guidance on design features such as font details, layout and colour combinations to name a few.

4.4.1 Brand

A complex issue that can occur is where repair café data includes several misspelt brands. An initial review of the FRC data corrected some errors. Further errors were resolved in the repair cafe data by using the feature in RM tool where it will provide options for the brand given the first few letters. But this only works if the error is in the end of the brand name. Many entries were searched using a search engine to identify the product and variations on the brand name, with some success.

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[3] UK Repair Cafe Network Survey, March 2024, Martin Charter, UCA

Brand or Manufacturer is another instance where inputted repair café data must adhere exactly with existing RM Tool data. This is a complex issue to resolve as the FRC data included over 5% of misspelt names. Some of these were simply incorrect and could not be resolved. Resolution of the issue was achieved by:

- Completing a review of the FRC Database prior to the data upload, looking for misspelt instances of the same Brand. This is readily achieved in MS Excel using the column search facility as shown below. This search also identified occurrences where the FRC Product field (equivalent to "Brand" in RM Tool) included model details as shown in Figure 5 below.

Figure 5: Example of product field including model data in FRC data
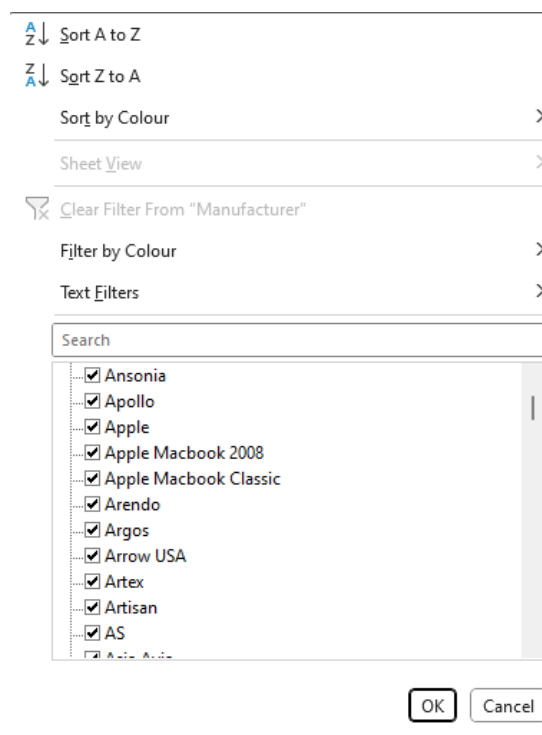

- Using the feature in RM Tool where it will provide options for the brand given the first few letters. But this only works if the error is at the end of the Brand name.
  Searching using Google (or other search engines) using product and then variations on the brand name.

The facility in the RM tool to add a new Brand/Kind of Product should be used as a last resort when a new repair is to be added. RCIF note that it is easy to add a new Brand/Kind of Product, but this can make considerable work for RCIF where different terms are used for similar items that exist already in the RM Tool. An example of this challenge related to kind of product is detailed in Section 6.2 below. Martine Postma of RCIF personally checks all newly added product names and brands and then merges different terms that define similar items. This work is undertaken by RCIF because when different terms are used to define a similar item it can dilute the value of the data. Broadly the approach should be as shown in Figure 6 below.

If a bulk upload is decided to be practicable option for a repair café, then the issue of Brands should be resolved before uploading the data, the new Brands could be uploaded into the RM

Tool "Brand" table before the bulk upload of the rest of the historic data. However, this issue has only come to light through manually uploading FRC data to the RM Tool so is considered that this will be a difficult issue to comprehensively correct logically. The problem is similar and particularly complex with "Kind of Product" as discussed below.

Figure 6: approach for selection of Brand in the RM Tool
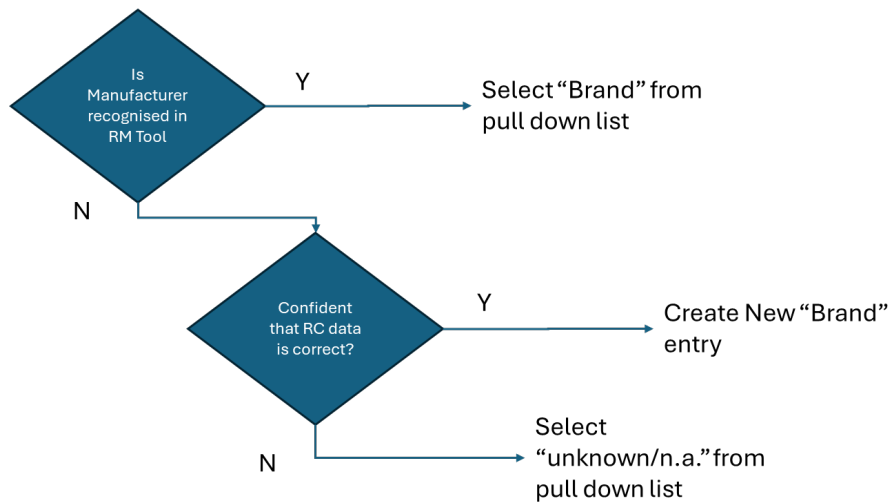
4.4.2 Kind of Product

FRC product and manufacturer descriptions have been reviewed in many cases to identify the best fit against the existing kind of product Taxonomy used by the RM Tool. Searches on this field often required several attempts. It is critical to use the existing RM Product Taxonomy where possible to avoid generating a plethora of terms for the same kind of product. The manual upload has shown a significant range of problems populating this RM Tool data field accurately:

- Firstly, a small but significant number of errors existed in the FRC data sets where the product field was incorrect as detailed in the discussion of Product Description and Taxonomy in Section 6.1 above.
- Secondly the RM Tool has data of over 100,000 repairs (as at 8th July 2024) on many thousands of different products entered by repairers in different continents. Terms used in the RM Tool use an international English which tends to have an American influence. Hence, the preferred description or terms used in the RM Tool may not be exactly as expected for native English readers/speakers, nonetheless the existing RM term should be used. The table below presents ten examples of the variations in Kind of Product seen with the FRC data. It must be stressed that this is only an example.

Figure 7 below provides an example of some of the variations noted between FRC terms for Product and the selected Kind of Product term in RM.

ID	Product	RM Kind of Product
1	Dog Lead	Dog Leash
2	Heated Clothes Airer	Heated Dryer/Airer
3	Carousel	Toy Merry Go Round
4	Jogging Bottoms	Track Pants
5	Kitchen Aid	Mixer/Blender
6	Radiator	Electric Heater/Radiator
7	Shredder	Paper Shredder
8	PS2	Game Console
9	Mixer	Food Processor
10	VHS	Video Player

4.4.3 Reason Behind Non-Repair

The RM Tool includes a field entitled "Reason behind non repair" which is a conditional field that should be completed if the repair is not possible. FRC data does not explicitly ask for details where the repair was not possible. However, it was possible to identify reasons behind non-repair from the data in most cases. Most commonly the reason could be found in the "Repair Solution" field in the FRC data, when the item was not repaired. However, some degree of interpretation was often required.

Figure 8 presents some examples of variations noted between FRC terms for Repair Solution and the selected Reason behind non-repair term in RM.

Figure 8: Selection of Reason behind non repair in the RM Tool

ID	FRC Repair Solution	RM Reason behind non-repair
1	No repair practical.	No way to fix product
2	Proved difficult to open without breaking casing so investigation abandoned.	No way to open the product
3	No access possible to damaged area.	No way to open the product
4	Re-fixed encoder strip but printer reporting h/w fault.	Unidentified failure
5	Beyond repair - unsafe.	Too worn out
6	Not fixable.	No way to fix product
7	Inspection of front panel, found tracks vaporized. These could be fixed but unfortunately the micro controller has been damaged. No spares available.	Spare parts not available on the market
8	No obvious fault, power or boards, but no signal.	Unidentified failure
9	Since replacement part not found on internet search. Probably not economical to fix.	Spare parts not available on the market or Too time consuming
10	Owner ran out of parking so declined repair.	Too time consuming

5. Effort

RCIF have advised that the RM Tool does not provide an option to upload bulk data. It has been tried, but it caused many errors to the system. Furthermore, while bulk upload would be effectively instantaneous, the data preparation beforehand is anything but instantaneous.

5.1   Manual Upload using the RM Form

Manual entry of data into the RM tool is likely to take between 5 and 7 hours per 100 records depending upon the completeness of the coverage of RM Tool fields, the accuracy/clarity of statements in the data, keyboard skills of the data analyst and the nature of the Repair Data (paper or digital). This estimate is based on the following:

- Weymouth: it takes about 5 hours to enter 70 - 80 records. This figure is based on paper repair records and therefore repair descriptions need to be typed into the RM Tool. There is no use of cut and paste from data held in another software tool. The data is collected in the RCIF format and includes the model (about 50% complete), year of manufacture and repair difficulty.
- FRC: a rate of approximately 20 per hour has been achieved based on data extracted from the FRC Database. Typing is still required to enter the date, record number, kind of product, brand and any corrections to the other fields containing repair details. The FRC data is not collected in the RCIF format and does not include model, year of manufacture and repair difficulty. The time taken to load FRC data includes the time to investigate and resolve the many challenges discussed above/below.

5.2   Data Manipulation/Correction and Bulk Transfer

RCIF advised (via email) that the RM Tool does not provide an option to upload bulk data. RCIF tried this in the past, but it caused many errors to the system, because the data was not all in the right format, even when a repair café was confident that they were.

The bulk upload of data into the RM Tool will be effectively instantaneous. The upload operation was a simple data transfer operation, taking a similar time to downloading data from the web and therefore typically will take seconds. The data preparation beforehand is significant and time consuming to ensure that the data is consistent, valid, complete and accurate. Views have been sought on this and it is considered that data preparation and development of software rules is likely to be more onerous than a simple manual upload for a data set of less than a few thousand repairs. Results and observations in this report are based upon FRC data for 1000 repairs between 2020 and 2024 that have been manually loaded into the RM Tool as the pilot data load. The full FRC database contains data for 3552 repairs between 2014 and 2024 The data preparation discussed in this report would need to be completed before a bulk upload of data to RM Tool could be completed. Data preparation would need to address the challenges identified in this report plus:

- Align Data Structures
- Data Cleansing
- Alignment with RM Tool Taxonomy

5.2.1 Align Data Structures

Repair café data must be converted to align with the data structure of the RM Tool prior to input. This will require knowledge of the structure of the tables in the RM Tool, i.e. the name of the table, the fields within them, which are the key fields and are there any dependencies? It will be necessary to identify a best fit of the repair café data fields with those in the RM Tool (See Section 4.2) if the data was not collected using the RM Tool format. Note that several exceptions have been found in the manual data upload of FRC data so this alignment exercise

would need a line-by-line check of the entries to ensure that entries are logically correct/not misplaced.

5.2.2 Data Cleansing

Data cleansing is the process of fixing or removing incorrect, corrupted, incorrectly formatted, duplicate or incomplete data. A data cleansing exercise was undertaken on the FRC data before and, importantly, during manual upload with simple searches and use of the filters as discussed in the section on specific challenges with the data pertaining to Brand.

5.2.3 Alignment with RM Tool Taxonomy

Taxonomy and terminology within the RM tool was reviewed and used to correct some of the entries in the FRC Database before commencing the manual upload of data. For example, for Brand = "Black + Decker"' use this format, not "Black and Decker", "Black & Decker", "Black&Decker", etc. as the brand 'Black + Decker" exists in the RM Tool. In the FRC case study these improvements were made iteratively during the data upload of the FRC data.

Repair café volunteers would need to review all the values currently held in the Brand table to revise their data to match prior to a bulk upload of data. Similarly Model Name and Kind of Product should all use existing RM terminology. Some are stored with spaces or hyphens or capital letters or lower case, it would be critical to revise the repair café's data into the exact format used by the RM Tool.

As with manual upload, the facility to add a new Brand or Kind of Product should be used as a last resort when a new repair is to be added. New brands could be uploaded into the Brand table before the bulk upload of the rest of the historic data however the challenge noted with Brand data would need to be comprehensively addressed prior to a bulk upload, noting that the problem is particularly severe with Kind of Product.

6. Discussion

Many of the challenges described in the FRC case study stem from the paper form being filled in by a repairer and then transcription by an administrator into MS Excel (FRC Database). This is always going to result in data errors, "to err is human", and then in further issues when trying to re-key this data into a constrained database with a different data schema.

The variety and sometimes complexity of these challenges (as detailed in Section 4) mean they would be difficult to overcome by inspection and review and tend to emerge only as data is read as it is manually uploaded. This supports the conclusion that the development of a software tool to convert and upload data would require more effort than manually uploading data for smaller data sets. Furthermore, RCIF are currently focused on improving the quality of their data and are unable to allocate time that would be required to support the development of such a software tool. However, this situation may change in the future.

7. Conclusion and Recommendation

7.1 Conclusion

This report provides guidance for repair cafes that may be considering uploading existing (legacy) data into the RM tool based on a case study from FRC. The project has identified many, maybe most, of the challenges to the development of a set of data that coheres precisely with the requirements of the RM Tool in order that they may be uploaded reliably into the tool. The development of a software tool to convert and upload data would require more effort than manually uploading data for smaller data sets. Bulk upload from such tools is not currently supported by RCIF.

7.2 Recommendation

There is no standard classification used to define repair activities by FRC or RCIF, it is considered that such definitions would be helpful but are likely be too onerous to manage for volunteer run organisations, but some guidance would be useful. This is an area that could be reviewed by RCIF and repair cafes.