

Creating Your Own 'App' Diary Project – A checklist, information & some examples

To cite: Spencer, L. and Radcliffe, L. (2018) Creating your own 'App' diary project: A checklist and information sheet. *Research Methods Festival*, National Centre for Research Methods

1. Is there an existing App I can use?

Yes, but with some caveats – several apps exist which are purportedly for use in collecting qualitative data, a list of which can be found here:

<https://tqr.nova.edu/apps/>

Many of these listed, such as Indeemo, offer services for a subscription fee which you would have to consider against the potential cost of developing your own app – whether you decide to learn to code or pay a developer to create your app.

A further shortfall of existing apps, is that although they may provide you with an innovative way of communicating with participants (i.e. the use of 'Slack' for example) you may struggle to collect the data back from participants (they would have to export this to you some way, Slack for example allows participants to export public channels). Furthermore, you have to consider that as the data would be owned by the app you are using, you will have to consider how this fits with your research ethical approval.

There are however, some ways you can work around the collection/ export of data issue - for example, there has been research done using Whatsapp or other instant messages (see Callaghan et al., 2010; Fontes & O'Mahony, 2008 as useful starting points). This again however is likely to be flagged when seeking ethical approval and a strong case will have to be made for the use of instant messaging in collecting your data. However, if your ethical review board is favourable the instant messages could act as a means to prompt and notify your participants each day so the sending of your diary questions (either all at once or in a conversational manner) may result in enhanced participation.

This may be most suited to small samples drawn from your personal/ professional network as some participants may start to find this kind of interaction bothersome or intrusive. In terms of the researcher, you may risk creating an enhanced bond or potentially strenuous relationship, which may make 'exiting' the researcher-researched relationship difficult and put you at risk – i.e. being contactable by a relative stranger at all times. If this strategy were something you would consider, it would be advisable that you use a device that is not your own personal device (again something that would need to be considered with reference to your ethical approval committee/ policy).

There are however, several 'pay-to-play' services that researchers can use which allow a reasonable amount of tailoring to your research needs, a good list of services

can be found here: <https://qual360.com/news-and-blogs2-a-quick-review-of-mobile-apps-for-qualitative-research/>

2. Can I develop my own App?

Yes! Learning to code is something that every researcher should consider, it will open several opportunities and you will be able to make your own apps for all your future research endeavours. However, this can be quite costly and time consuming; well-credited organisations that offer training can be found at <https://makers.tech/apply/>, Udemy <https://www.udemy.com/> (who offer great sales with huge discounts on courses as low as £10.99 instead of £200+) and Codecademy <https://www.codecademy.com/> who offer (some) free training. Also see: <https://girlswhocode.com/>

If becoming a full-fledged coder is something you aren't interested in or do not have the time, you may be interested in learning to build *simple* apps using app development platforms (basic skeletons that you can build on using pre-established blocks of code). In 2018 the NCRM ran two training courses with Dr Chris Burchell on how to create apps without coding using these platforms – so make sure to check <https://www.ncrm.ac.uk/training/> for future events.

In the meantime, you can check out <http://www.appinventor.org/> and <https://thinkable.com> to get started, these websites often include tutorials which will help you along.

3. Funding your own App - <https://www.the-app-developers.co.uk/app-dev-news/the-cost-of-an-app/> Might be useful

- **What will it cost?**

From an external App Development company, we were quoted approximately £10,000 (to give you a rough ball-park figure) to build 2 Apps (one for Android and one for iOS) as well as the back-end website for ourselves as researchers. However, each additional element of functionality you might wish to add to your App can increase the cost, so think about what is important to you and necessary for your research project, as well as considering what you might be willing to compromise on. It is a good idea to be really clear on your priorities before meeting with an App developer.

The primary factors influencing development costs include:

- ❖ Platform(s)
- ❖ Functionality
- ❖ Design
- ❖ Developer/organisation

It is also important to remember that there are likely to be additional costs further down the line. For instance, for iOS apps, the Apple App Store charges fee of \$99/year. Google Play has a one-time fee of \$25. The cost of doing so on Windows is much cheaper than the others and is charged at around \$12.

It is also vital to consider ***the need to maintain Apps*** depending how long you will need the Apps to be functional for your project (or beyond). For example, every time Apple decide to update their iOS version, this can impact the usability and functionality of your App and your App may require minor, or even fairly major, updates to continue working properly. You need to make sure you budget for these updates, as well as agreeing how this will work with your developer. A good rule of thumb is to budget 20% of the cost of initial development when calculating how much it will cost to maintain software.

- **How can I find funding?**

Finding funding for App development as a researcher can be challenging as this request can seem to deviate from standard research funding requests or applications. Often traditional grant application forms are not set up for this kind of request, unless it is clearly built into an overall project as part of a large grant proposal.

If you are not able to rely on the receipt of a large-scale grant, there are other options you can consider.

There is the possibility that you may not need to find funding should you manage to secure the support of ***Institutional App development specialists*** (see below '**Finding the right person for the job**').

If you require funding, you could first seek internal ***institutional 'Pump Priming' funding***, depending how much money is available. It may be that this would at least allow to produce one version of the App for testing (or potentially even to complete your App development should you source more cost-effective options. Again, see below, '**Finding the right person for the job**'). It is, of course, important to read the guidelines and be prepared to seek out the people in charge of awarding this funding to further explain your ideas and why having an 'App' is key to your research project. Having the opportunity to speak to people about your ideas is useful when what you are proposing may seem unusual. Often such funding requires you to demonstrate how this will lead to applying for larger-scale grants and/or future publications, so you need to ensure that you focus on such requirements. Here is an example excerpt from the argument we used to receive internal funding:

"The creation of such an App at a time when this type of research is being called for by leading journals in the Management field provides us with the opportunity to be seen as an institution engaged in cutting edge research,

and a reference point for other institutions. The creation of this App provides ULMS staff and PGR students with an excellent opportunity to engage in 4 research with strong potential to lead to numerous (and ongoing) 4* publications, therefore contributing to the next REF and to the recognised research excellence and innovation of our Management School. There is therefore the potential for such an App to attract applications from staff and PhD students interested in such methodological approaches due to us having the appropriate tools to support this...”*

When applying for funding, those judging your application may ask some technical questions that might be difficult for you to answer without having an App developer with whom you can discuss their queries. In this respect, it is useful to be in touch with a potential App Developer prior to making an application for funding. This is also key to being able to complete the costing within your application.

Other potentially useful source of funding for App development:

- ❖ INNOVATE UK - <https://www.gov.uk/apply-funding-innovation>
- ❖ JISC - <https://www.jisc.ac.uk/blog/jisc-and-crowdfunding-14-may-2012>

4. IMPORTANT: Data privacy and IP – things to discuss with a legal representative and APP developer

We are not experts here, but from our experience, we recommend the following steps as a starting point – Laura and Leighann

Most developers will be familiar with data privacy but to make sure you aren't going into any meeting with developers uninformed you should consider the following steps:

- I. The introduction of **GDPR** has changed how privacy is conceived so you need to make sure that you understand this first and foremost, as useful source can be found at <https://ico.org.uk/media/for-organisations/data-protection-reform/overview-of-the-gdpr-1-13.pdf>
- II. **Meet with your institutions legal department or industry-academia collaboration team before meeting with an App Developer.** The legal department should be able to offer you free legal advice and likely be willing to **draw up an agreement/contract** if the institution funds the app. Having a contract in place before App Developers begin working on your App is vital to ensure that IP, payment and ongoing App maintenance is clear and agreed by all parties. Stances toward researcher IP within higher education institutes differ, and you should make sure that you understand and ask about issues of ownership and IP, and that this is clear and understood by all parties. The legal department will know what is required for an adequate **privacy policy** (which they can also help you to create) and you should make sure to consult with them and discuss the following:

- i. Make sure that the **ownership of the data** is well defined, understood and agreed – i.e. Where will the data be held? Is it yours or the app developers or the institutions? Is it the UK? How long will it be stored for?
- ii. Be clear on what kinds of data you are seeking to collect – different types of data have different kinds of privacy implications, make sure you know this and discuss this with a legal professional.
- iii. Have a clear idea of who the app users are – data collected from children for example is likely to have different privacy implications.
- iv. Drawing up a contract for you and the developer(s) – this will protect your IP and prevent any miscommunications about agreed work to be conducted, project milestones and fees. This should hopefully protect you from any legal risks.

5. Developing the App

- **Finding the right person for the job**
 - If you are situated within a University, we would recommend considering your in-house App development options before going elsewhere. Many Universities have a centrally situated (or perhaps even School level in some Institutions/Schools) IT support, within which there is often a team of **Institutional App development specialists**. Ask what is available within your institution before going elsewhere. Within UoL, for example, there is an application process where you can apply to have your App developed internally, which is judged on the extent to which it is linked to the Universities strategic priorities, and the competitive advantage it will add to the University as a whole, as well as to the specific School or Department.
 - Another option for in-house App development if direct Institutional-level support proves difficult, is to build relationships with the **IT/Computing School within your Institution**. There may be an academic who specialises in App development and/or they might consider offering it as an MSc level project. Of course, here you will need the good fortune of connecting with someone in this School who is excited by your project and who you can work with. This would probably need to be considered as a true collaboration, in the sense that an academic member of staff from another School would become part of the project team and potentially a collaborating author on any future publications. Such terms should be agreed early on. If you are considering using an MSc student who has App development expertise, you may still need to consider some funding if this is deemed to be a summer project outside of their standard course content (speak to your finance team to help you cost this according to institutionally agreed rates for MSc level research

assistants). You will also need to be very clear that they have the level of skills and ability required to develop the App functionality that you require to make your App a success. Speaking to course tutors would be key here.

- A final potential option for in-house development is to consider any PhD students (within IT/Computing Schools or potentially in your own or other Schools) who have the required App development skills. You will need to be clear about whether the PhD student is operating in the capacity of a University PhD student, or as an individual App developer. This distinction is very important when establishing payment (i.e. will they be paid as a research assistant or as an external App developer – speak to your finance team to help you cost this according to institutionally agreed rates for PhD level research assistants) and IP. It is important that you seek guidance from your Institutional legal team about IP at this point (see point 5, below) and have a contract drawn up and signed by both parties. It is likely that IP will belong to your institution.
- If in-house developers are not an option, your School is likely to have a procurement process that you need to go through to source a developer. ***Speak to whoever oversees procurement*** within your School. For links to reasonably priced App Developers you could speak with the following (for example):
 - ❖ Founders & Coders: <https://foundersandcoders.com/>
 - ❖ Droovy: <https://www.linkedin.com/in/omar-khaled-3b826719/>

- **Communicating your ideas**

When you are communicating with potential App developers, whether they are in-house or external to your institution, you need to be quite well prepared and have the ideas for your App well-established and clear.

It would be useful to prepare the following documents:

- ❖ A screen by screen mark-up of your App – including what each screen would look like, with side notes to explain any additional features you would want to include on each screen (see the example within our presentation). Remember to include a participant consent screen that aligns with University ethics (which can be set up to link to a full participant information sheet – see the example provided in the presentation).
- ❖ A Word document that clearly lays out, using bullet points, the functionality you require for yourself as the researcher, and for your participants. This should include the App capabilities and type of data

to be collected – photo, text, voice, GPS/ location, activity. It is also useful to be clear on what is a priority in order to make your research project work, and what is negotiable depending on the impact on cost. It is therefore useful to have a clear priority order of the different things that you want the App to be able to achieve (see the attached document as an example). Think about what is important to keep your participants engaged (i.e. what would be interesting and useful for them), as well as the data you need to collect.

It might also be useful to refer to this information sheet when talking with developers who are likely to discuss the different platforms and programming languages that you want to use. They might also ask you ***why you want an 'App' specifically rather than just a website*** that can be accessed through participants mobile phones. Here is why:

- ❖ They are less intuitive and interactive, slower operating speed – not user friendly and therefore will hinder diary completion rather than make it easier for participants to complete the diary
- ❖ They don't work without internet connection, leading to the same problems as above
- ❖ They only appear on the home screen if a user bookmarks them through their browser, making it more difficult for participants to access quickly

You need to be prepared to talk about all these things at your first meeting. We went to our first meeting very unprepared and ended up a little lost! We hope this information sheet will help you to go to your first meeting with an App Developer more prepared to discuss the issues that they will see as key and prepared to answer the kinds of questions they will ask.

- **Development across different platforms**

Remember: If you want your app to be accessed on different devices (i.e. iOS and Android), you must create two separate versions.

These Apps will require different App coding skills as different programming languages are usually necessary for building Apps on these different platforms, so you need to make sure that the person/people building your App have the skills to create both. Most developers specialise in one platform so you need to think about this when finding your developer.

This will necessitate additional time and cost.

The Apps must also be approved on the iTunes App store and must be published on both the iTunes App store and Google Play.

Maintaining and updating the app across the codebase and app store on two platforms is demanding.

Ask developers about 'Hybrid Apps' and whether this would be a possibility for the particular App you are looking to develop. They are much quicker to develop because most development is done using standard web technologies. However, performance may not be as good as those separately designed for different platforms.

- **Pilot testing the App**

Once an initial version of your App is up and running, which will probably be on one platform initially (usually Android, as developers tend to prefer this to iOS and it is cheaper and easier to publish) you will then need to have a few people ready to test the App out for you. These can be friends or people in your personal network who are willing to report back all bugs, glitches and spelling errors for you. You will, of course, also need to spend time testing it yourself.

Here it is useful to prepare a Word document that clearly outlines the errors, glitches and issues that you and others have found. It can help to include screen shots as well as written information.

You will then also need to do the same for version of the App on any other platforms (e.g. iOS), as well as piloting the back-end of the App (usually a researcher, password protected, webpage), where you receive the data. Is this working? Are you receiving all the data? Are you receiving the data in a form that doesn't cause you a lot of extra work - an app should make your life easier not harder! Remember that just because the App is now working well on one platform does not mean that it will be functioning in the same way on the other platform.

There are likely to be several rounds of pilot testing and it is vital that sufficient time is built into your project plan from the beginning, as well as a timeframe being agreed with your App Developer from the outset. This stage can easily end up taking much longer than expected, particularly as you are waiting for others to (kindly) pilot the App for you. It can be useful to set deadlines for each stage of piloting with your App developer and try to stick to these as closely as possible. Be prepared for at least 3 round of pilot testing, with the first stage (hopefully) taking the longest.

Once you are entirely happy with the App then it is time to publish your App on the relevant stores (which your App Developer should help you with) and begin designing diary instructions for, and advertising to, potential participants.

Good Luck!!

References

Callaghan, J., Barber, H., Cusik, C., & Buchanan, K. (2010). Chatting online: The use of instant messaging in qualitative research. Retrieved from https://www.researchgate.net/publication/47747337_Chatting_online_the_use_of_instant_messaging_in_qualitative_research

Fontes, T. O., & O'Mahony, M. (2008). In-depth interviewing by Instant Messaging. *Social Research Update*, 53(2), 1-4. **(Highly recommend looking at the articles which have cited this, there are several useful examples)**

Further Reading on Qualitative Diaries

Bolger, N., Davis, A., & Rafaeli, E. (2003) Diary methods: Capturing life as it is lived. *Annual Review of Psychology*, 54, 579-616

Crozier, S. E., & Cassell, C. M. (2015). Methodological considerations in the use of audio diaries in work psychology: Adding to the qualitative toolkit. *Journal of Occupational and Organizational Psychology*

Radcliffe, L. (2018) Capturing the Complexity of Daily Workplace Experiences Using Qualitative Diaries. In C. Cassell, A. Cunliffe and G. Grandy (Eds) *The SAGE Handbook of Qualitative Business and Management Research Methods*. SAGE Publications: London

Radcliffe, L. S. (2013). Qualitative diaries: uncovering the complexities of work-life decision-making. *Qualitative Research in Organizations and Management: An International Journal*, 8(2), 163-180

Symon, G. (2004) Qualitative research diaries. Sited in: C.M Cassell and G. Symon (Eds) *Essential Guide to Qualitative Methods in Organizational Research*, (pp. 98-114). Sage Publications Ltd

APPENDIX A

Communicating your ideas with App developers – Functional priorities

What would I like to be able to do?

- Track same participant entries across days (and date/time stamped)/ receive data in an accessible way – **P1**
- Send automatic reminders to participants phones at specified times (e.g. beginning and end of the day – reminders at the beginning of the day would be worded slightly differently than those at the end of the day) – **P2**
- Collect some basic demographic information about participants when they first register – **P3**
- Be able to change the questions participants are being asked – **P4**
- Be able to change the reminders that are sent – **P4**
- Be able to send participants customised messages asking further questions in response to what they have written that day – **P4**
- Reminders triggered by particular events – e.g. If a participant does not record anything on a particular day they receive a reminder that they haven't, if they have recorded an event/emotion but not added any further details could have a reminder a certain number of hours later/ or at a set time that evening – **P5**

What do I want users to be able to do?

- Access and use the app as easily and quickly as possible/ user-friendly/ encourage use – **P1**
- Provide qualitative answers to questions whenever they experience a particular event (ideally every day but with the possibility of being able to complete entries more/less frequently if necessary) – **P1**
- Allow them to make a quick record of how they are feeling (e.g. emotion rating/ scale), which they can then come back to later to complete more qualitative elements – **P2**
- Press something on home screen/ phone to record that an event has occurred somehow/ a means of very quick and easy acknowledgement of event – stores time/date/ participant – so they can go back and complete qualitative elements later. This would be fantastic as but I realise this might not be possible! – **P4**
- Be able to include photos, voice memos, videos in their entries – **P5**
- Be able to view their own experiences, chart of emotions over the time period – **P5**

P= Priority order