Patient-led innovation

How to run, take part in and support a

Health App Challenge

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1. About

1.1 This booklet

This information booklet tells you what you need to know about getting involved in a Health App Challenge – whether you want to design, create or review health apps, support people who do or run your own Challenge. Based on our experiences and knowledge of running a Health App Challenge we explain patient-developed apps, the Health App Challenge model, and how intellectual property is handled in this situation.

Our Challenge focused on apps for managing diabetes and weight loss surgery and we use examples of this in the booklet. However, the Health App Challenge model can be applied to other conditions.

Some sections of the booklet will be more useful to you than others, depending on how you want to get involved, but we recommend reading the whole booklet to understand the complete process. The information is designed for:

<table>
<thead>
<tr>
<th>Audience</th>
<th>Who</th>
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<tr>
<td>Patient developers</td>
<td>People with a health condition (in our experience, diabetes and bariatric service users) and an idea for an app that might help them and others with their condition, who want to turn their idea into an app with our support either on their own, in their own team or with a developer (see below)</td>
<td>Developing an app</td>
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<tr>
<td>Developers</td>
<td>People interested in working with patients, exercising and improving their technical skills to help turn an idea into an app. This includes professional, student, and amateur developers. N.B. They do not have to have the condition themselves</td>
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<td>Health professionals</td>
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<td>Other Health App Challenge organisers</td>
<td>Essentially a Health App Challenge is an information exchange – a way of bringing together and organising the various ‘players’ (as above) for patient-centred development of apps. Our premise for this booklet was that medical charities might take on this role. However, NHS or commercial organisations or some consortium of all players, might wish to take the organiser’s role</td>
<td>Running a Health App Challenge</td>
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1.2 The Health App Challenge model

The process of the Health App Challenge model is as follows:

- **Review existing apps** Invite patients to review health apps they have used, for the purpose of informing other patients looking for useful apps to help with self-management and to help identify ‘app gaps’ in the market for potential app developers
- **Design/develop an app** Invite patients (with optional support) to design and develop their own health apps they think will help with their condition self-management. They can enter their completed app or their app design to the Health App Challenge (see Section 2 for details). Design submissions allow people without technical skills or whose apps may take
longer than the Health App Challenge to develop, an opportunity to take part. In our competition we ran two simultaneous Challenges for diabetes and for pre/post weight loss surgery

- **Provide support** During the design/development stage; provide support, information and opportunity for collaboration with others, including teleconference discussions (e.g. between patients, developers, charities, health professionals etc.)
- **Showcase** Present the patient-created apps and designs on the website review pages
- **Review patient-designs/apps** Invite other patients to review the patient-created apps and designs, offering feedback and support to help shape future versions and development
- **Awards** As a competition, offer rewards to app-developers and prize draw incentives for app reviewers
- **Disseminate** All the while raising awareness of patient-led innovation for supporting health self-management. We developed this best practice model, and describe it in more detail in this booklet, to help inform others interested in sustaining and running future Health App Challenges.

### 1.2.1 Definition: Health App Challenge

The Health App Challenge is an online competition. Patients are invited (with support) to create their own apps to help with their health condition. These are then offered to other patients to try out and review. Below is a process model of the Health App Challenge 2014:

A Health App Challenge is a bit like a ‘Hackathon’ but over a longer period of time. A Hackathon is an online or face-to-face event, usually lasting 2 days, where computer programmers are given the task of completing a software project. Hackathons tend to be more focused on app development where a ‘problem’ has already been identified. The Health App Challenge is equally focused on identifying the problem and general form of an app.

### 1.2.2 Definition: App

An App (Application) is “a computer program that is designed for a particular purpose.” In this booklet we use the term ‘app’ inclusively of any computer, Smartphone or tablet accessible tool. With this broad definition in mind, for the Health App Challenge, apps may be:

- **Native apps** i.e. those that are specifically written to run on a mobile device (e.g. smartphone or tablet) using that software (e.g. iOS, Android)
- **Websites** – whether or not they are designed for access on a computer or laptop or responsively designed to work well on smaller mobile devices
- **Social media**, making use of existing platforms (without the need to write code) such as Twitter and Facebook groups, discussion forums and Blogs.
1.3 Background and Funding

This booklet was produced as a result of a one-year project run by Plymouth University, in collaboration with WLSinfo, Diabetes UK, HandiHealth and Britains Nurses and funded by the Intellectual Property Office Fast Forward Competition 2014.

The project followed the Diabetes App Challenge 2012 (DAC2012), successfully run by Plymouth University and funded by Diabetes UK. The DAC2012 explored a new ‘patient-centred’ approach for engaging young people with diabetes (YPD) with health services through patient-led health app development and trial. We recruited young people (aged 16-25) with diabetes, helped them form teams, and supported them in developing apps. We gave a broad remit that the app should be to help YPD make consultations more focused on their needs. Six teams developed and successfully submitted apps that were then trialled by 83 young people with diabetes. 63% thought the peer-created apps were useful or very useful for preparing for or setting the focus of their clinical appointment.

“I think that the Diabetes App Challenge was a great idea, and I really enjoyed trying out free apps that were actually very helpful and helped me become more organised for my appointment with my DSN and doctor.”

- App reviewer, Diabetes App Challenge 2012

We wanted to know if the DAC2012 model could be applied to other conditions, and if the process could be sustained. We had discussed with Diabetes UK how we might sustain the six apps from DAC 2012 – perhaps by combining them into one app but reached no resolution. At the end of 2013 an opportunity came for further funding through the Intellectual Property Office (IPO) and their Fast Forward Competition 2014. We were successful in obtaining funding and this booklet is the product of the further project.

We aimed to expand from our previous experience with young people to ALL people with diabetes, and, via WLSinfo, to those who are pre or post weight loss (bariatric) surgery. We aimed to explore how charities can manage Health App Challenges in which patients and developers are supportively formed into teams to create new condition related apps to aid health self-management.

Beyond the scope of the Health App Challenge but in a similar vein, Hackathons challenge computer programmers, software developers, and engineers to create original software and hardware from scratch, all within (say) 48 hours. Typically Hackathons involve computer programmers sitting up all night and often eating erratically, they are high stress and therefore not necessarily to be recommended to a group developing apps for people with health conditions! But they have been successful – see for example, Hacking Health and ‘Health hackathon brings life agile solutions for unmet needs’. Health App Challenges can offer similar opportunities for bringing people together in fun learning experiences but are not as limited by time, or by geography, allowing teams to work with the target group and discuss variations and adaptations. Both Hackathons and Health App Challenges usually end with prizes for the best contributions.

1.4 Why patient-centred app development?

There are benefits to patients in using ehealth (technology for healthcare) methods, such as CCBT (computerised cognitive behavioural therapy) for mental health, discussion forums for social support, and telehealth (e.g. video-calling between patient and health professional) for communication and information. A new addition in recent years is mobile applications as an ehealth tool benefiting patient self-management.
Finding ways to help people self manage their conditions is important for long-term health benefits. The DAC2012 arose from the observed disengagement between young people and healthcare professionals as demonstrated by the number of missed clinic appointments. Such problems of management and engagement in clinical consultations highlighted a lack of a patient-centred approach. There is a need for exploring what can help patients from their point of view. Therefore the DAC2012 was run to incorporate both technology and a patient-centred approach with positive results.

“It is very important to me that the people designing these apps were young people with diabetes because they knew exactly how we feel and what would be useful to us. People without diabetes would struggle to know exactly how we feel and exactly what would be useful to us. The people who designed these apps designed them to make life easier for themselves, meaning it is likely that others like them would benefit from what they have created”

- App reviewer, Diabetes App Challenge 2012

Technology is increasingly accessible and affordable, but changes rapidly, requiring designs to adapt and ‘keep up’. Larger projects often fail to involve patients in all stages of their development; they can take a long time and cost hundreds of thousands of pounds. The Health App Challenge allowed for quick, low cost innovation with a patient-developer community producing ideas and designs for the greater patient good.

“I felt there was a market for this app since I have had problems in the past with showing my BG [Blood glucose] results to consultants and have had problems recording them. Since people (nearly) always have their phones with them an app that records your BG readings means you can always record them for clinic”

- App developer, Diabetes App Challenge 2012

Evaluation of the impact of apps, through, for example, randomised controlled trials can take years to complete. Evaluation of the content and accuracy of apps might be addressed by the NHS Health Apps Library but so far only a minority of apps are currently listed there. We wanted to offer a platform for peer review to help inform new app users and app designers alike. Thus creating a cycle of patient app design, development, use and review. This quick feedback cycle may also speed up the process of app release and revision.

Peer review sites such as Trip Advisor are well known and work because people like to give their views and to help others. The same principle works in reviewing health apps. Patients’ reviews in the DAC2012 included in the process of looking for new ways to help others with their condition were valued. Patients of course know their own needs but might assume they are typical of all
patients. It is possible they are not. On the other hand, if they have developed something that really meets their own needs the chances are that it will be transferable to some others.

“There isn't enough support out there for the age group this was specifically aimed at, and I feel that projects like this are a great way to involve young people with diabetes. It is definitely something I would participate in again”

- App reviewer, Diabetes App Challenge 2012

1.5 Why support patient-centred app development?

1.5.1 Health professionals

In a Health App Challenge the target audience is the patient – i.e. apps developed by patients for patients. Nevertheless, health professional input can be highly valuable in: (i) guiding patient developers to ensure app information content is appropriate/accurate; and (ii) design collaboration for an app to work well within the clinical process. For example, in the DAC2012 we found that patients were assisted and collaborated better with their health professionals in bringing their apps to the consultation and using them to discuss blood glucose trends recorded or notes prompting discussion.

In addition, the information and resources provided in this booklet can be of use to health professionals who, like many patient-developers, have great ideas for a health app but do not know how to take it further.

1.5.2 Technical developers

In our Challenges, developers were mostly recruited via email to university computer science departments. Their interests matched that of patients to create an app for the Challenge and were motivated by (i) the challenge of a project (perhaps meeting some coursework requirement) with (ii) real potential to help others.

“Making an app which has a real world use, and which could actually help people with their lives (as opposed to apps which are purely for entertainment)”

- App developer, Diabetes App Challenge 2012 (when asked what interested them in taking part)

A wide range of potential professional app developers may also be interested not just because of commercial opportunities but also because of the attraction of investigating new organisations and identifying opportunities. Health professionals have also expressed an interest in developing apps themselves. They may achieve a minor return on their investment but generally do it from altruism, satisfaction, to help their own patients, research esteem and skills development.

1.5.3 Medical charities

Running a Health App Challenge can be a great opportunity to enable and support members to collaborate on a project that offers the potential for new and useful tools to aid health condition management. Running a Challenge can promote and encourage new patient-led innovation for improving health conditions.

Medical charities represent a large economic sector (over £20bn) and potentially are major owners of software Intellectual Property (IP). They obviously vary in size from small charities (e.g. WLSInfo) who maintain an information exchange and do not have the funding or capacity to write their own apps, to charities such as Diabetes UK, that has its own IT department and has written
or commissioned the writing of apps, or (currently 2014-5) aiming to develop its websites in responsive design for use on any device.

1.5.4 Quality Assurance providers and App distributors

We list Quality Assurance providers and App distributors together as often an organisation will have the dual role. The main player in England is the NHS Choices Health Apps Library. They list apps they have approved. Charities (as above) could do the same but, as far as we know, do not yet do so. There are also various technical Quality Assurance organisations that offer assessment and validation of apps, which can reassure end users. As apps become increasingly popular tools for health management, it has become more important to establish which apps are safe and trusted. We include these both here as they may play a role in future Health App Challenges.

1.6 Project team and contact

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Richard Elliott........ Research Communications Manager, Diabetes UK
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Sally Norton.......... Consultant Upper GI & Bariatric Surgery, North Bristol NHS Trust
Dr Anthony Hill....... Senior Innovation Manager, NHS Innovations South East
Sharon Bates.......... Bariatric Specialist Nurse
Matthew Jennings..... Editor, Britain’s Nurses

All of our app reviewers, app developers, champions, booklet reviewers and those who took part in the teleconference week, especially to Laura Cleverly, Simon Fisher, Aaron Phelan and Martin Jenner.

Disclaimer

Although we have made every effort to ensure that the information in this booklet was correct at dissemination, the authors do not assume and hereby disclaim any liability for any errors or omissions.
2 Design and develop an app

This section of the booklet details the step-by-step process of patient-led health app design and development for the Health App Challenge 2014, as offered to patient-designers/developers interested in taking part.

We also had interest from health professionals wanting to make their own apps for their department. This section might offer some useful information to such health professionals, but we also suggest ‘App Development: An NHS Guide for Developing Mobile Healthcare Applications’ created by NHS Innovations South East. That document includes details specific to NHS organisations.

This section will also be useful for people interested in running future Health App Challenges as it details the process of participation.

2.1 Participation

2.1.1 Registering to take part

Whether looking for ideas, or mid-development when they heard about the Health App Challenge, participants registered to take part so they could receive information and support. The project team included people with different areas of expertise such as technical development skills, intellectual property knowledge and medical expertise, as well as general support provided by the project team.

The Health App Challenge team offered:

- **Technical support.** We offered this via HandiHealth who provided support via a dedicated email address for any technical issues or queries during app development. Details of the technical support email address were supplied upon registration.

- **Medical expert advice.** Our team included a diabetes clinician who was consulted to review and give feedback to queries and app design content regarding medical information. Designers were advised during the Challenge whether the design content was accurate, suitable and safe for users.

- **Intellectual property advice.** Our team included an intellectual property expert who provided information about different intellectual property rights so participants could make an informed decision about showcasing designs and apps to others.

- **Team ‘match-making’ support.** The project team main contact offered support and made introductions between people wanting to collaborate with others. For example, those with a condition but no app making skills, and those with app making skills but no condition, could request to be teamed up to make an app together. With the availability of remote communication (e.g. Skype, email, DropBox etc.) match-made teams did not need to live geographically near each other. On request, and if ‘matches’ were available, each person was emailed and introduced to each other by the project main contact.

- **General support.** All queries and updates on progress went to the project team main contact who monitored progress, offered support, and directed queries to the most appropriate team member.

Registration was a simple process through our website at [www.healthappchallenge.org.uk](http://www.healthappchallenge.org.uk) and by completing a brief online registration form we were alerted to participant interest to take part, enabling us to make contact with more information.
As long as the main applicant to the Health App Challenge was a person with (in our case) diabetes or pre/post weight loss surgery and living in the UK, the team could be very varied comprising a single patient-developer, a group of friends, or match-made. We welcomed people of any age, but if under the age of 16, a parent or guardian was required to be a team member.

2.1.2 Expectations

The Health App Challenge took place over a number of months, but we did not want participants to feel that they had to make a large, complicated or polished app in that time (this could be worked on later if needed). Participants were encouraged to consider the Health App Challenge as a Hackathon without such time pressures.

Sometimes the simplest ideas can be the most effective, so we hoped to encourage small but useful tools and ideas or improvements on existing models. If participants’ ideas were more complicated or may have taken more than a few months to develop, we recommended they started with their design (that could be submitted on its own to the Health App Challenge) and let the project team help them find the right people to collaborate with so they could develop it as needed, rather than within the Health App Challenge timeframe.

The entry specifications were broad, and invited participants to design and/or develop something that they thought would be useful for diabetes or weight loss surgery self-management. We expected simple, handy tools to make self-management easier, and not complex prescriptive or diagnostic tools (which would require regulation beyond our means unless submitted as just the design).

The apps were designed and developed by patients and their teams, so after the Health App Challenge concluded, continued to belong to them. We hoped that developers gained useful feedback from reviewers and continued to offer their app for health self-management.

2.1.3 Taking part in the teleconference week

The Health App Challenge organisers offered a ‘teleconference week’ for potential developers, reviewers and others interested in taking part, to raise questions with the experts, hear from the experiences of other potential designers, developers and reviewers and also network and discuss possible collaborations. It was a series of one-hour group telephone discussions part way through the Health App Challenge (September 2014). Notes from each session were documented including advice and useful resources suggested, and emailed to each attendee.

2.1.4 Submitting a design to the Health App Challenge

Once they had drawn up their design, whether they intended to the turn it into an app or not, we recommended participants submit the app design to the Health App Challenge. This option was useful for those who (i) did not have app developing skills but wanted to take part and showcase their idea, with the opportunity of later collaborating with someone to help turn the idea into an app or (ii) wanted some patient feedback on their designs before proceeding to develop the app.

When designs were ready to be submitted to the Health App Challenge, we asked participants to email the project team main contact with both:

- A completed Health App Challenge submission form (just a few questions about the design, the team and motivations)
- The app design. This could be a link to the URL location of the app design (e.g. a YouTube demonstration, a mock-up tool link or blog etc.) or document files containing the app design (e.g. Word document, PDF, PowerPoint slides etc.)

The project team assessed the design and if any alterations were required regarding suitability, we contacted and supported the participant with any changes needed before showcasing on the
website for other patients to review. Participants could follow the feedback by other patients on the Health App Challenge website review pages.

**Design submission reward**

For submitting a design and having it showcased on our website, we offered £100 to the design team as reward for taking part. Plus, after the review stage, the submitted app or design with the best patient reviews was awarded an additional £200.

From there, if participants wanted to (and had the time within the Health App Challenge deadline), we offered support in turning the design into a working app that could also be submitted to the Health App Challenge.

**2.1.5 Submitting an app to the Health App Challenge**

When apps were ready to be submitted to the Health App Challenge, we asked participants to email the project team main contact with both:

- A completed Health App Challenge submission form (just a few questions about the app, the team and motivations)
- The URL link to the location of the app. This could be its location on an app store website, its live website address or other (e.g. blog or social media address).

As with design submissions, the project team assessed the app (i.e. checked it for glitches, harmful content etc.) and if any alterations were required regarding suitability, we contacted and supported the participant with any changes needed before showcasing on the website for other patients to review. Participants could follow the feedback by other patients on our Health App Challenge website review pages.

**App submission reward**

For submitting an app and having it showcased on our website, we offered £300 to the team as reward for taking part. Plus, after the review stage, the submitted app or design with the best patient reviews was awarded an additional £200.

The apps and designs belonged to participants (and their teammates), throughout and after the Health App Challenge. We hoped that they would gain useful feedback from reviewers, meet potential future collaborators (e.g. via the teleconference sessions or email interest from health professionals and developers) and continue to offer their apps for others to use, or turn the designs into apps to benefit health self-management.

**2.2 Process of app design**

**2.2.1 Finding an ‘app gap’**

So someone has a great idea for a health app to help others with this condition, what do they do now? Before they get the wheels in motion, they first check, (i) has it already been done? And (ii) is it what others want?

As a patient-led approach, the need for a ‘new’ app, or app adaptation is grounded in the real needs of patients. However, some may not know about existing apps, and not all patients with a particular condition have the same information and communication needs. So patient-app developers need to base their ideas on their own needs but also checking against any formal reviews that may have been published, or apps that have ‘good reviews’. Apps with poor reviews
may be a good target for a new app. Methods to link apps, or ‘add value’ to an existing website or app may be another useful development.

To find this out, there are resources for exploring what apps others are using, what they think about them, what hasn’t already been developed i.e. ‘app gaps’ in the market, and what others want. Potential designers for the Health App Challenge were directed to the information sources below, in particular, our own app review pages (point four):

- **Published reviews.** There are various published reviews both in journals and more ‘magazine’ style publications. As part of DAC2012, from a short survey using Twitter we published *Apps and online resources for young people with diabetes: the facts*. This highlighted the different categories of apps available for diabetes from blood glucose recording to psychological support. Other publications available at the time included:
  - A systematic review of interactive computer-assisted technology in diabetes
  - An evaluation of diabetes self-management applications for Android smartphones
  - TotallyHealth use of PDAs in long term conditions
- **Social media discussions.** Just as some reports are informed by social media discussions (e.g. our Twitter survey as above and Diabetes in the UK: Social media intelligence healthcare report) so too could participants get a better understanding of what others were discussing. For our Challenge this included:
  - Tweeters (e.g. @Ninjabetic1)
  - Facebook groups (e.g. Diabetes UK)
  - Discussion forums (e.g. Diabetes.co.uk)
  - Blogs (e.g. Every day ups and downs, a diabetes blog)
- **App stores and accredited listings.** The most obvious app stores to look for available apps and the reviews of the users are the iOS iTunes store, the Android Google play store, but there are many others including Windows Phone, Nokia, and Blackberry. A good source of accredited apps is the NHS Choices Health Apps Library
- **Review sites.** Reviews are likely to have a relatively short shelf life as operating systems and software environments evolve and patients’ expectations change. But the Health App Challenge organisers included a review section, in the style of Trip Advisor for hotels. Ours was at Health App Challenge, where we welcomed developers to see what others were using and why, to think about the ‘app gaps’ without necessarily having to disclose their ideas to ‘the world’.

### 2.2.2 Design tools

People may have scribbled their ideas down on a piece of paper, but how do they take the next step in visualising how it will ‘look and feel’? There are a number of ways to plan out what each screen will look like and what each button function will do. Depending on the type of app they want to make and their design skills, here are a couple of suggestions and links to useful resources:

- **Detailed illustrations.** Pen and paper drawings with text description or computer application drawing tools
- **Video demonstration.** Using detailed illustrations, verbally explain the app design in a video
- **Blog description.** Create a blog that can include illustrations, text description and video demonstration
- **Wireframe and mock-up tools.** There are a number of computer application tools that allow production of a visual guide of the app or website design. Here are some useful links: mock-up tools review (part 1), and mock-up tools review (part 2), others include excellent tools for design mock-ups, 26 app mock-up and prototype tools, 11 free mock-up and wireframe tools for web designers
2.2.3 Function

The Health App Challenge was focused on small-scale apps with one or a few functions that were written by patients for patients (e.g. agenda setting for appointments, data logging, peer communication etc.) that could help with, for example, organisation, motivation, knowledge or support. Packing too many functions into an app, e.g. an ‘all in one’ can be complicated, and for a specific audience can be a large effort with a potentially small uptake. ‘One size does not fit all’ so some people might use multiple apps to suit their needs.

Keep it simple

“On Twitter there is a app called NHS Flo it’s very simple and Twitter works because it’s simple. The design goal should be keep it simple”

- Teleconference participant, Health App Challenge

The generally accepted modern approach to software development is that we no longer try to build mammoth integrated systems, but produce smaller apps that do one aspect of data collection or management, and which ‘work with’ other apps to form the overall system. This is inter-operability, which was beyond scope of the Health Challenge initially, but is worth considering and potentially developing further down the line.

2.2.4 Type of app

Participants needed to consider what type of app they wanted to make (for example, native, hybrid, mobile web app…), as each method is quite different from the other.

More detailed information can be found online, but here we briefly summarise popular types of app:

- **Native app.** A native app is developed for one particular platform and using a programming language specific to that platform (e.g. using Swift language, for an iPhone device on iOS platform). The app can be designed to make use of the devices features such as GPS, notification alerts and contact list, and once installed on the device, can be used offline. A native app is published to an app store where users can install the app. Example native apps include Angry Birds and Instagram.

- **Hybrid app.** A hybrid app is developed to be compatible with particular platforms using a programming language that can be adapted for different platforms. The app can make use of some of the devices features and once installed often needs an internet connection to work. A hybrid app is published to an app store where users can install the app. An example hybrid app is Facebook, which can access the devices notifications and contacts but requires an internet connection for full function.

For both native apps and hybrid apps, there are a number of mobile phone platforms/ operating systems to choose from, with Android (46%) and iOS (43%) being the most popular in the current market (Net Market Share). Others include Windows Phone, Nokia and Blackberry.

- **Mobile web app.** A mobile web app is developed as a website but with adaptable layout so it can be easily displayed on various devices and platforms. It is accessed via the devices internet browser (i.e. by entering the URL web address of the mobile web app) and needs an internet connection to work. Users can bookmark the web address so future access is via a saved icon (that looks much like the icon of an installed native or hybrid app). An example of a mobile web app is Yell.com. It is accessed through the device browser laid out for easier viewing (compared to the lay out when accessing via a desktop computer). It does offer the option to install it as an app (i.e. developed as a hybrid also) or continue viewing it as is.
• **Website.** A website is developed to be best viewed on a desktop computer or tablet for access to all its features and easy navigation. It is accessed via the device's internet browser and needs an internet connection to work.

Some websites visited via the device's browser will offer multiple viewing options. Sometimes they appear automatically in a format easily readable on the device (mobile web app) and will offer the options to view the full site (website) or download the app (hybrid).

• **Existing app/website.** When developing their own app, participants might not have thought about making use of an existing app. But this can be an ideal way to make their app without needing technical developer skills. For example, they might design an app that invites patients to discuss and support each other regarding their condition, such as personal stories, words of support and encouragement, exchange recipes or tips for day to day management. To make this, rather than build an app from scratch, they could set up a Facebook group, Twitter account or Blog (e.g. Wordpress). As the person setting up the group, they can have Admin and Moderator control of the content including images, and membership to the group.

Additionally, some apps can make use of multiple app types, such as developing a hybrid app and making use of an existing app/website (i.e. Facebook group) to raise awareness and enable user feedback of the app.

### 2.2.5 Costs

We expected apps developed for the Health App Challenge to be **made available free of charge to users.** This was because (i) we wanted people to use and review the apps submitted without financial limitations, (ii) many people are not willing to pay for mobile apps and may prevent them from reviewing the app and (iii) we encouraged health app development primarily for the benefit of improving patient health.

To reimburse development costs and reward participation, we offered £300 for developer teams whose apps were showcased on the website and an additional £200 to the team with the best user reviews. For app design teams, to reward participation and potentially contribute towards future app development, we offered £100 for designs showcased on the website, and were included for consideration of the additional £200 to the team with the best user reviews.

With a Health App Challenge, like Hackathons (but longer), it is best to keep apps simple and to take an ‘agile’ approach. This includes developing quickly, getting user feedback and responding (as needed) to the users’ recommendations in future revisions. This approach is very different compared to professional app development where app costs can range from £1,000 to £30,000, are more complex and takes much longer to develop.

Time and effort can be the biggest cost, and publishing and hosting costs are relatively small:

- **iOS / Apple.** To publish an iOS app to the Apple store is free but does require an annual $99 USD (at time of distribution, approximately £63 GBP) fee for Apple Developer Programs.
- **Android/ Google.** To publish an Android app to the Google Play store costs a one off $25 USD (at time of distribution, approximately £16 GBP) fee for Google Play Developer Console account.
- **Website.** To have a website requires (i) a domain name (e.g. www.healthappchallenge.org.uk) that can cost approximately £3 to £10 per year and (ii) the website hosted on a server (e.g. storage of website files for people to access the website) that can cost approximately £2 to £10 per month.
- **Facebook or Twitter group.** Free.
- **Blog.** Free.
These costs are to give a rough guide to the costs of publishing an app or making a website live in order to submit and have showcased for the Health App Challenge. There are of course other costs to consider such as developer program tools, but these vary greatly depending on personal preferences and type of app development.

For details on potential funding opportunities beyond the Health App Challenge, please see subsection 2.4.1 Funding, within section 2.4 Beyond the Challenge.

2.2.6 Building and coding

The details of how participants built their apps was up to them – whether it was a mobile app, website or other type of app, and with so many options and choices, cannot all be listed here. However, whether they worked on their own or with team members, we offered technical support to any queries regarding app development. As part of the project team of experts, we had a dedicated email channel set up with HandiHealth who were on hand to help. These details were included in the welcome email when people registered to take part.

Included below is a list of links as useful guides when developing apps (these include official platform sites and other articles).

<table>
<thead>
<tr>
<th>Type of app development</th>
<th>Links to useful guides</th>
</tr>
</thead>
<tbody>
<tr>
<td>Android, iOS and web development</td>
<td>Treehouse</td>
</tr>
<tr>
<td>Android app development</td>
<td>Android: Android Design</td>
</tr>
<tr>
<td></td>
<td>LifeHacker: I want to write Android apps. Where do I start?</td>
</tr>
<tr>
<td>iOS app development</td>
<td>Apple: iOS Dev Centre</td>
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<tr>
<td></td>
<td>LifeHacker: I want to write iOS apps. Where do I start?</td>
</tr>
<tr>
<td>Website development</td>
<td>LifeHacker: How to make a website. The complete beginners guide</td>
</tr>
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<td></td>
<td>WikiHow: How to make a website</td>
</tr>
<tr>
<td>Web app development</td>
<td>WebDesigner: How to build web apps with HTML5, CSS3 and JavaScript</td>
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<tr>
<td>Nokia app development</td>
<td>Nokia Developer</td>
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<tr>
<td>Windows Phone app development</td>
<td>Windows: Dev Centre</td>
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<tr>
<td>BlackBerry app development</td>
<td>BlackBerry: Developer</td>
</tr>
<tr>
<td>Facebook Group</td>
<td>Facebook: Group Basics</td>
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<tr>
<td></td>
<td>WikiHow: How to create a new Facebook group</td>
</tr>
<tr>
<td>Blog</td>
<td>Google Blogger: Getting started guide</td>
</tr>
<tr>
<td></td>
<td>WikiHow: How to start a blog</td>
</tr>
</tbody>
</table>

2.2.7 Risks and responsibility

**Risk assessment:** What is the worst that can happen if any part of an app or website is used incorrectly, malfunctions or even used correctly? What potential effect does its use have on the user and the device it is being used on, and how can the risks be reduced? We recommended participants made regular risk assessments regarding their app as good practice.

In principle, any developer registered with Apple or Android can publish an app. Usually the relevant app store will vet the application for malicious or potentially damaging elements before allowing publication and release. However, they do not take any responsibility for the app even if it is published successfully.

**Data protection:** How safe is the users’ information when using an app or website regarding security from external access and data protection? If the app is designed to process any personal data of the user, it must follow the Data Protection Act 1998. This includes any data accessible to anyone other than the user that can identify who the user is. The Information Commissioner’s Office provides a series of documents that explains data protection and privacy online specifically in website and mobile app development. If participants were unsure of anything, they were directed to the HandiHealth website that contains a discussion forum for such queries.
Transparency: If there were any calculations as part of the app function, the developers were instructed that the process be explained clearly and visibly to the end user within the app. For example, if the app calculated insulin dosage, developers ensured that the formula for the calculation was detailed so the user could make an informed choice whether to use it or not. The developer needed to be transparent to the user how the user’s data was used, stored or processed and by whom. This also enabled them to make an informed choice whether to use the app or not.

Disclaimer: A disclaimer is often a few sentences included within an app to remind the user that they use the app at their own risk. This is because even if the developer does everything they can to ensure the function and content information is correct, there may be some errors (e.g. the app is used incorrectly or the app information isn’t updated). ‘Website Disclaimers – why have them and what should you include?’ offers further information. A disclaimer for a mobile app is often included within the platform’s End User Licence Agreement (EULA) but we recommended developers also included it somewhere quite visible within the app.

2.2.8 Health app or medical device?

A health app by definition is an application program that offers a health related service, for example as a notes or data organiser, health information or social support. These can be made available for others to use freely. However, some health apps are also classed as medical devices and these are regulated and require approval before they can be safely offered to others for use. These include apps used in direct diagnosis, monitoring, or treatment of bodily processes, or software that is a part of a physical medical device. An example of an app that is also a medical device (and has gone through the proper regulatory channels of registration and approval), is the Mersey Burns app, designed to support physicians in assessing and treating burn victims.

Apps developed for the Health App Challenge were not medical devices. Participants also needed to make clear the purpose and function of the app (i.e. that it just gives the users information, or helped process information) and that it did not have any ‘decision making’ capabilities.

Therefore, participants who thought their app might have been a medical device, were advised to explore the information available and make a decision whether to make changes to the app or apply for approval as a medical device. The Health App Challenge team also offered guidance and advice on this matter.

2.2.9 Definition: What is a medical device?

A medical device traditionally is defined as a physical piece of medical equipment but as app capabilities have increased, this too can be considered a medical device if:

- The software is part of a medical device or is used to deliver medication, energy or remove substances from the body
- The software is used in direct diagnosis, monitoring, or treatment of physiological processes

If an app is considered a medical device, separate instructions need to be followed for developing as it requires application and approval processes.

Finding a definitive and clear explanation of whether the app is a medical device will require some research, and the best source of information is the MRHA (Medicines and Healthcare products Regulatory Agency) and the other links below:

- MHRA: Guidance on medical device stand-alone software (including apps)
- Handi: Guidance on mobile health apps
- D4: Regulation of health apps. A practical guide
The above information holds for the UK and the European Union. If participants wished to later launch their app in the USA, they needed to adhere to US legislation and guidelines from the [Food and Drugs Administration](https://www.fda.gov) (FDA).

### 2.3 Intellectual Property

During the Health App Challenge, email support was offered to participants for any Intellectual Property (IP) queries they may have had, we offered the IP supplement (included at the end of this document) and recommended the [Intellectual Property Office](https://www.justice.gov/知识产权办公室) website for more detailed information. Please see the IP supplement for more details.

### 2.4 Beyond the Challenge

For taking part in the Health App Challenge we supported opportunities to collaborate with others, showcased apps or designs on our website and raised awareness for other patients to try out and review them, and rewarded money towards the cost of development, publication and maintenance over the course of the project.

Beyond the Health App Challenge we hoped that participants were able to continue offering their apps or turn their designs into apps for the benefit of other patients. There is a number of potential funding and marketing opportunities that may help people to further develop, sustain, promote awareness to and improve health apps in the future.

#### 2.4.1 Funding

There are a few options for finding potential sources of funding including:

- **Crowdfunding.** Crowdfunding is a way to raise money for an app by appealing to people (investors) online, though, for example, [Crowdfunder](https://crowdfunder.co.uk) where plans can be promoted inviting small amounts of money from lots of people to get it going. Other platforms for crowdfunding include [Indiegogo](https://www.indiegogo.com), [appbackr](https://appbackr.com) and [AppsFunder](https://appsfunder.com). It is best to check the details of the crowdfunding website before committing to ensure it is suitable for the developer’s needs (e.g. regarding the rights to the app and payment if funding is secured).

- **Other Health App Challenges.** The Health App Challenge project aimed to promote this method of generating and supporting patient-led innovation (with small financial rewards to help with costs) and encouraged others (such as medical charities) to run their own Health App Challenges in the future.

- **Network.** Networking (i.e. getting to know people knowledgeable in apps and healthcare) can be very useful for finding out about how they and others have funded app development. This can be done by setting up a social media page like [LinkedIn](https://www.linkedin.com), [Facebook](https://www.facebook.com) or [Twitter](https://twitter.com), with the opportunity to follow, like and connect with potential investors or other useful contacts that may offer information, news or support.

- **Advertising within the app or website.** Although adverts can be annoying in apps and on websites, they can potentially offer a source of income to keep a free app going. There are a number of different methods of payment, including payment per app install, payment per click (i.e. on the advert from within the app) or pay per advert seen (i.e. on a website). [AdMob](https://www.admob.com) and [InMobi](https://www.inmobi.com) are popular for in-app advertising, and [Google AdSense](https://www.google.com/adwords) are popular for in-website and blog advertising.

Health professionals looking for app funding might consider appealing to project boards, strategic networks, or education programs. There are also innovation competitions (including mobile health apps) that provide funding opportunities for SMEs (small and medium-sized enterprises).
2.4.2 Marketing

There are options for finding potential sources to help market an app including:

- **Set up a social media page.** Facebook and Twitter accounts for an app can be easily set up and be useful platforms for (i) updating people about any new developments, (ii) inviting feedback for comment and discussion, and (iii) promoting awareness by asking others to like, share or retweet news of the app. There are other options for using social media to promote awareness including creating a blog, Instagram or LinkedIn accounts.

- **Submit it to an app review website.** If the app is published to an app store, the number of downloads, star ratings and feedback from users can be useful for alerting others to the app. The [NHS Choices Health Apps Library](http://www.nhs choicesappslibrary.nhs.uk) also helps others discover new and useful health apps. Apps can be submitted to the site, and if approved, displayed on their site.

- **Friends and family.** Word of mouth can be quite effective for setting the wheels in motion of awareness for an app. Anyone the developer knows who is able to help can email, Tweet, post messages on Facebook, discussions forums, and talk to people about the app.

- **Network.** As for funding opportunities, networking can be very useful for finding an audience. Setting up a social media page like LinkedIn, Facebook or Twitter, where the developer can follow, like and connect with professionals who may offer information, news or support.
3 Review an app

This section of the booklet details the process of how patients can review existing apps and the process of reviewing apps and designs during the Health App Challenge.

The above design and development section of this booklet can be useful to patient-reviewers too, as it lists various places to find existing health apps that have been reviewed by other users and professionals (such as social media discussions, app stores and published reviews etc.). It also highlights the Health App Challenge process that included reviewers welcomed to join in the teleconference week to hear from others and share views.

Patient opinions and experiences of apps for healthcare matter and we hoped that the Health App Challenge platform provided such an opportunity to voice opinions and learn from peer experiences. Just as when considering buying anything online, others’ reviews are often incredibly helpful and informative. This shared information can help potential developers and others decide which new apps to use to support health self-management.

For patients designing and developing health apps, feedback can be very useful to them on (i) existing health apps to help them identify an ‘app gap’ (i.e. what is missing or could be improved in the current market of apps) and (ii) their designed and developed apps to help inform and shape future versions of the app (e.g. need, function and usability).

If reviewers were not sure what to write in their review, we suggested they consider what they might want to know about an app before trying it. For example: What makes it worth using? How does it run? Has it helped and how? What might be missing that would make it better?

3.1 Review an existing app

In the first stage of app reviewing, we wanted to get the ball rolling and invite reviews of existing apps to the Health App Challenge website. We had a star rating system so the average stars given could be seen for each app listed and the number of reviews each app had received. Participants simply clicked on the app to review and filled out the brief review form. If the app was not yet listed, they could add it via the review form.

It was a simple process and took no more than 5 minutes to review. Participants could write anything and everything they wanted to say about the app: ‘the good, the bad and the ugly’. However, before reviews were made live on the website, they were moderated by the project team to exclude any offensive or inappropriate content.

**Existing app review reward**

For each review of an existing app, in this first stage of reviewing, participants were entered into our prize draw to win £200. This was drawn part way through the Health App Challenge (during the teleconference week). The more apps participants reviewed, the more chances they had of winning the prize draw money.

3.2 Review an app or design created for the Health App Challenge

In the second stage of app reviewing, to support the patient designers and developers, we invited reviews of the contest designs and apps for constructive feedback. Reviewers told them and us via the app review form if their app or design could be helpful or not, and what they liked and did
not like about it. The process of submitting a review of a Health App Challenge design or app was the same as for existing apps.

<table>
<thead>
<tr>
<th>Health App Challenge design or app review reward</th>
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</thead>
<tbody>
<tr>
<td>For each review of a patient design or app (that was showcased on the Challenge website) participants were entered into our prize draw to win £200. This was drawn towards the end of the Challenge. The more apps or designs they reviewed, the more chances they had of winning the prize draw money.</td>
</tr>
</tbody>
</table>
This section of the booklet details the process of running the Health App Challenge from our experiences. We aim to offer some insight and guidance for those interested in running future Health App Challenges. There is also relevant information within the other sections of the booklet to give a better understanding of what participants will need to know.

In the Health App Challenge 2014, two Challenges were run simultaneously. These included the Diabetes App Challenge and the Bariatric App Challenge. Both Challenges had the same processes but one was for diabetes and one for pre or post weight loss surgery patients. Here we describe the process of running just one Challenge, the Diabetes App Challenge to simplify the description.

Timeline

The Health App Challenge 2014 project ran for just over one year, with participation running for 10 of those months. This included:

<table>
<thead>
<tr>
<th>Event</th>
<th>Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preparations</td>
<td>24th March to 28th May 2014</td>
</tr>
<tr>
<td>Website live</td>
<td>29th May 2014</td>
</tr>
<tr>
<td>Patient review of existing app</td>
<td>29th May to 9th September 2014</td>
</tr>
<tr>
<td>Teleconference week</td>
<td>8th September to 12th September 2014</td>
</tr>
<tr>
<td>Reviewer prize draw (existing apps)</td>
<td>10th September 2014</td>
</tr>
<tr>
<td>Submit app or design</td>
<td>29th May 2014 to 2nd February 2015</td>
</tr>
<tr>
<td>Developer submission rewards</td>
<td>When reviewed by project team and showcased on website</td>
</tr>
<tr>
<td>Patient review of developed apps and designs</td>
<td>From first submission to 16th March 2015</td>
</tr>
<tr>
<td>Reviewer prize draw (Challenge submissions)</td>
<td>18th March 2015</td>
</tr>
<tr>
<td>Developer prize for best reviewed app or design</td>
<td>18th March 2015</td>
</tr>
<tr>
<td>Write up and dissemination</td>
<td>During the project up until 29th May 2015</td>
</tr>
</tbody>
</table>

4.1. Set up the Health App Challenge website

The Health App Challenge website was the main location for people to:

- **Find out more about the Health App Challenge.** This included how people could take part, the project purpose as well as project team contact details.

- **Review apps.** This was a dedicated section of the Health App Challenge website that allowed people to add new reviews (i.e. of apps that were not already listed) and add to existing reviews (i.e. ones that had been added either by patient reviewers or by the project team). This served the purpose for reviews of existing apps, and later, reviews of Health App Challenge designed and developed apps. In the Health App Challenge, reviews were moderated and made live on the website manually after checks for spam, offensive or inappropriate content.

- **Register to develop or design apps.** This included a brief form to complete and submit by those interested in designing or developing an app. This was to notify the team of interested parties who were then contacted by email with more information to start a dialogue.
4.2 Raising awareness

From previous experience, advertising (for both reviewers and developers) was most effective by online methods. There are many online channels to use that can reach a wide audience free of charge.

These were the methods used for the Health App Challenge:

- **Social media.** We set up a Health App Challenge Twitter, Facebook and YouTube account. Through Facebook we posted messages on our own page and on the pages of relevant groups, ‘liked’ relevant group pages and invited people to ‘like’ our page. Through Twitter we posted messages, encouraged ‘retweets’ for further reach and ‘followed’ relevant groups. These also served as a platform for people to comment about the project (as well as direct email contact with the team). We posted a number of information videos to our YouTube account and shared the URL links via Facebook and Twitter. In addition (following approval from moderators), messages were posted in relevant discussion forums informing of our project, how to take part with links to the project website.

- **Known contacts.** We made use of contacts established over the years including colleagues, associates and past project participants. They were mostly contacted by email, and informed of the project with a request to further circulate to others who might be interested.

- **Found contacts.** Google online searches were conducted to find email contact details of relevant groups and included health support groups, surgery departments and online news groups. They were informed of the project with a request to further circulate to others who might be interested. University computer science departments were effective for raising awareness to computer science students interested in supporting patient-developers; and other health related groups and departments were effective for raising awareness to potential patient reviewers and developers.

- **‘Champions’ (paid).** We advertised for ‘Champions’, via email and social media. The role of Champion was to promote the Health App Challenge and share the project website address online. This was done via social media, using, for example, Twitter and Facebook.
We recruited people who were frequent social media users and either had a relevant health condition or worked in an area of that condition to help us promote the Health App Challenge. Each Champion was set up with a unique URL (i.e. a landing page) for the Health App Challenge website. For example, www.healthappchallenge.org.uk/emily. For each ‘click’ from a new visitor from this landing page, earned the Champion £0.50. This was tracked using Google Analytics. In addition, for each new registered reviewer or developer, the Champion earned £2.00. This was tracked within the online reviewer and developer form by including the Champion’s name within the answer options to the question, “Where did you hear about the Health App Challenge?”.

There was also potential, as in our experience, to raise awareness to previous Challenge patient-developer teams (i.e. DAC2012) who were interested in participating with a previous entry, seeking support to expand and develop their health app further.

**Website analytics**

As above (for tracking Champion referrals to the website), it was very useful to track website activity using Google Analytics. This showed Health App Challenge website activity including the number of new visitors to the website and when, routes to the website (e.g. landing pages), and audience demographics (e.g. country and device accessed from). This information helped inform the effectiveness of different advertising methods and whether they were reaching the desired audience.

**4.3 Participant reward system**

As an incentive for people to take part, rewards were given to (i) reviewers for sharing their views on the apps they had used, and reviews on Health App Challenge submitted designed and developed apps, and (ii) Health App Challenge designers and developers for submitting their design or app, and for the best design or app according to the reviewers.

**4.3.1 Reviewer rewards**

- **Of existing apps.** Each patient review of an existing app on the Health App Challenge website was an entry into the prize draw to win £200. As incentive to review multiple apps, the more reviews a person added, the more chances they had of winning the £200 prize.
- **Of Health App Challenge designs and developed apps.** Further into the project, each patient review of a Challenge designed and developed app on the Health App Challenge website was an entry into the second prize draw to win £200. As before, as incentive to review multiple Health App Challenge designs and apps, the more reviews a person added, the more chances they had of winning the £200 prize.

For example, if a patient reviewed 5 existing apps (among 50 reviews), they had a 10% chance of winning £200. If they then reviewed 6 Challenge designs or apps (among 30 reviews), they had a 20% chance of winning a further £200.
4.3.2 Developer rewards

- **App designs.** For teams who submitted a health app design, checked by us and showcased on the Health App Challenge website, they were awarded £100 (per design/team).
- **Developed apps.** For teams who submitted a health app (i.e. a published app, hosted website or live blog or other social media platform) checked by us and showcased on the Health App Challenge website, they were awarded £300 (per app/team).
- **Best app or design.** Following patient reviews of the Health App Challenge submitted designs and apps, the project team analysed the reviews and star ratings given for each. The app or design deemed ‘the best’ by reviewers was awarded an additional £200 (per app or design/team).

For example, if a patient submitted a design (£100), that was showcased on the website, then developed their design and submitted an app within the Health App Challenge deadlines (£300), they would be awarded £400. If that app then received the best website reviews (£200), they would be awarded a total of £600. If that app design and development team comprised 2 people, each team member would be awarded £300 (or divided how best the team members saw fit).

4.4 Teleconference week

We ran a week-long series of one-hour teleconference sessions, inviting anyone interested in the Health App Challenge to take part in these group telephone discussions. This invitation went out to all Health App Challenge designers/developers and their teams, app reviewers, experts (e.g. in intellectual property, healthcare, technical development etc.), related charities, health professionals, quality assurance and app distributors and others with an interest in the project. This was an opportunity for questions to be answered, experiences shared, discussions raised and potential future collaborations.

The teleconference sessions took place towards the end of reviews of existing apps and towards the start of patient app design and development. The project team chaired the sessions and participation was via telephone to a designated free-phone number. Each one hour session had a brief agenda planned based on feedback from reviewers and designers/developers regarding what they would like to discuss. This included, in our experience, (i) intellectual property and medical device issues, (ii) patient app testing and other collaborative input, (iii) clinical needs of people with diabetes or bariatric surgery and the role of apps, (iv) technical issues in app development, particularly open source software and (v) sustainability and funding of apps and the future of Health App Challenges.

Notes were taken during each teleconference that included details of the discussion, suggested useful sources and information provided by the project team and attendees. These were subsequently emailed to each attendee of the teleconference for reference.

Initially, we had intended to run a face-to-face workshop day in Plymouth where the project team is based (offering to reimburse travel and accommodation expenses). There was much interest, however as the Challenge is UK-wide, few people were able to travel or take time off work to attend. Thus, the teleconference sessions were run in its place with a good ‘virtual’ turn out and is the recommended method for future Health App Challenges.
4.5 Participation and support process

There were 3 participation stages in the Health App Challenge, (i) review existing apps, (ii) design and/or develop apps and (iii) review submitted designs and apps. The process of supporting participation in each of these stages is detailed below.

4.5.1 Review existing health apps

We invited patients to review apps they had used (past or present) in relation to their condition. This offered a platform for people to share their experiences of apps with others who might be interested in trying out a new app to help with their condition. It also offered a platform for potential app developers to learn about possible ‘app gaps’ when designing their app where a new concept could be useful instead of ‘reinventing the wheel’. This was set up as a ‘Trip Advisor’ style review page. People could add their review for an app already listed or start a new app thread if it was not listed.

<table>
<thead>
<tr>
<th>APP / WEBSITE NAME</th>
<th>RATING</th>
<th>REVIEWS</th>
<th>Review</th>
</tr>
</thead>
<tbody>
<tr>
<td><a href="http://www.diabetesdaily.com">www.diabetesdaily.com</a> (Website)</td>
<td>★★★★★ ⬤</td>
<td>2</td>
<td>Review</td>
</tr>
<tr>
<td>MyDiabetes (Android)</td>
<td>★★★★★</td>
<td>1</td>
<td>Review</td>
</tr>
<tr>
<td>DiabetesPA (Apple / iOS)</td>
<td>★★★★★</td>
<td>2</td>
<td>Review</td>
</tr>
<tr>
<td>Pump up (Android)</td>
<td>★★★★★</td>
<td>1</td>
<td>Review</td>
</tr>
<tr>
<td>On track Diabetes (Android)</td>
<td>★★★★★</td>
<td>3</td>
<td>Review</td>
</tr>
<tr>
<td>MySugr (Apple / iOS)</td>
<td>★★★★★</td>
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<td>Review</td>
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<td>DAFNE app (Apple / iOS)</td>
<td>★★★★★ ⬤</td>
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<td>Review</td>
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<td>Carbs &amp; Cals (Apple / iOS)</td>
<td>★★★★★</td>
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<td>BGStar Diabetes Manager (Apple / iOS)</td>
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<tr>
<td>Cook and Count Carbs (Apple / iOS)</td>
<td>★★★★★</td>
<td>2</td>
<td>Review</td>
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</tbody>
</table>

Reviewers completed the form on the ‘App Review’ section of the website. These submitted reviews were not automatically live on the website and required a member of the project team to activate. This enabled us to check first that the review was (i) not spam, (ii) appropriate content and (iii) a genuine link to the app location. Reviewer details were documented for future project use only, including email contact for notification of prize draw winners.

Email communication with app reviewers was not required, except to inform of any Health App Challenge updates and notify prize draw winners.
4.5.2 Design and/or develop health apps

We invited patients to register their interest in designing and/or developing an app for the Health App Challenge that they thought would be useful for health self-management. This let us know who was interested so we could open a channel of contact to offer support and information as they began their app design and developing.

Teams were supported by email and were offered more information about the project and the support available to them. Through email communication we found out if and what help they needed, their stage of app progression and team details. Registration details were documented for communication and future project use only, including prize rewards.
Developer communication included:

- **Team needs.** To establish what their team needs were i.e. were they a patient with the skills to develop their own app or had their own team? Or did they need someone to help them bring their idea to life, or were they a developer who wanted to support a service user to take part? Here is where the project team offered a ‘match-making’ service via email communication to create new teams led by the patient and supported by someone with app or website technology skills. The project team identified those interested in teaming up, and made introductions by email for future communication and app development. If there were any problems within these teams (e.g. one member could no longer take part), the project team endeavoured to support and/or find other potential members to team with.

- **App development needs.** As detailed within the patient app design and development section, developers were offered support from members of the project team or team collaborators who were experts in areas such as intellectual property, technical development and medical content.

- **Progress updates.** The project team updated the app developer teams with the timeline of the project, any news and information (e.g. rewards and teleconference instructions etc.) and asked for updates on how they were getting on with app development and if they required any assistance from the project team.

- **App or design submission.** During progress updates, the project team established and offered guidance on design suitability (e.g. that the app was not a medical device or unsafe for users). This was reviewed again by the project team and tested by medical and technical experts when developers submitted their final app to the Challenge (i.e. for quality of content, no glitches and safe for offering to others). If there were any problems, the team worked with the developers to make any necessary changes before adding to the project website, showcasing for others to use and review. Submissions were done by email to the project team with (i) a completed Health App Challenge submission form (to identify details of the app, its platform, function and reasons for the design), and (ii) the location of the app or design. For app submissions, the URL link to its location (e.g. iTunes, website address etc.), and for design submissions, depending on the format, the URL link to the YouTube or Blog demonstration, or document files (which could be added to a file sharing site such as Dropbox).

<table>
<thead>
<tr>
<th>APP / WEBSITE NAME</th>
<th>RATING</th>
<th>REVIEWS</th>
</tr>
</thead>
<tbody>
<tr>
<td>HAC MOCK-UP BWell Sugars System (Other)</td>
<td>3/5</td>
<td>NEW</td>
</tr>
<tr>
<td>Diasend (Website)</td>
<td>5/5</td>
<td>2</td>
</tr>
<tr>
<td>diabetic tracker (Windows Phone)</td>
<td>5/5</td>
<td>1</td>
</tr>
<tr>
<td>Myfitnesspal (Website)</td>
<td>5/5</td>
<td>2</td>
</tr>
<tr>
<td>Facebook diabetess (Other)</td>
<td>3/5</td>
<td>1</td>
</tr>
<tr>
<td>MyFitnessPal (Apple / IOS)</td>
<td>5/5</td>
<td>1</td>
</tr>
<tr>
<td>Facebook diabetess (Apple / iOS)</td>
<td>3/5</td>
<td>1</td>
</tr>
<tr>
<td>mySusr Diabetes Companion (Apple / IOS)</td>
<td>5/5</td>
<td>3</td>
</tr>
<tr>
<td>MySusr (Android)</td>
<td>5/5</td>
<td>2</td>
</tr>
<tr>
<td>Carbs &amp; Cals (Android)</td>
<td>3/5</td>
<td>1</td>
</tr>
<tr>
<td>Cock and Count Carbs (Apple / IOS)</td>
<td>5/5</td>
<td>2</td>
</tr>
<tr>
<td>EasyDiabetes (Apple / IOS)</td>
<td>3/5</td>
<td>1</td>
</tr>
<tr>
<td>BIGStar Diabetes Manager (Apple / IOS)</td>
<td>5/5</td>
<td>2</td>
</tr>
<tr>
<td>Carbs &amp; Cals (Apple / IOS)</td>
<td>3/5</td>
<td>15</td>
</tr>
</tbody>
</table>

*Designs submitted and showcased on the Reviews page.*
4.5.3 Review Health App Challenge designs and developed apps

We invited patients to review the designs and apps created by patients and their team members for the Health App Challenge. This peer review platform enabled (i) reviewers to offer developers feedback to inform future revisions of what worked well and what did not, (ii) offer reviewers an opportunity to try out new patient-led innovation and help shape future tools for self-management. The process of administration and moderation remained the same as before for existing apps.

4.6 Costs of running a Health App Challenge

The costs of running a Health App Challenge may vary greatly depending on budget available, duration and team and participant recruitment among other factors.

Key budget allocations for the Health App Challenge included:

- **Project website development.** To begin the Health App Challenge and offer a platform for participation, a website needed developing. Our project team were not able to develop the website, so a website developer was needed.
- **Advertising.** Most Health App Challenge advertising costed more time than money, through making contacts and raising the project profile. Past experience with paid advertising (DAC2012), such as Google Adwords attracted people to the project Facebook page but was not as effective at recruiting participants. Paying ‘Champions’ to raise awareness via social media was a useful method.
- **Participant rewards.** Participant invitation to take part both in (i) app reviewing and (ii) app developing required incentives for appeal.
- **Team support.** To support developers in specialist areas such as intellectual property, medical information content in apps and technical development, experts were needed to be on hand to be able to provide this service.
- **Facilitation and project management.** For day-to-day running and overall management of the project, core team members were needed for communicating with participants and between support members, advertising and recruitment among other tasks.
5 Working with a Health App Challenge

If running a Health App Challenge is not an option, there are other ways to collaborate, offer support and sustain patient-led innovation beyond the Health App Challenge. We had interest from a number of interested parties during the Health App Challenge with different backgrounds of expertise and discussed ways in which they might want to get involved. These included:

- Accrediting apps
- Providing a platform for app review
- Supporting and sustaining user-developed apps

5.1 Accrediting apps

As health apps are increasingly becoming popular and encouraged for health self-management, how do app users know which ones are safe to use, and how are patient-developers guided to ensure their apps are safe for other users? The NHS is seeking to 'kite mark' health apps, like a 'stamp of approval' making it easier for people to recognise quality tools for patient self-management.

During the Health App Challenge, developers were supported in ensuring their apps were safe and suitable before offering for others to use. We offered guidance on the Data Protection Act, risk assessments, appropriateness of content and checked that the apps were not considered medical devices (which would require MHRA registration). The project team, a collaboration of expertise in healthcare, health informatics and technology, provided this support.

Additional support from experts, quality assurance providers, distributors and medical charities during a Health App Challenge and beyond could be a beneficial opportunity to help provide patient app developers with useful guidelines to making safe and quality apps. As well as offer accreditation or a ‘stamp of approval’ for patient-developed apps that have been tested and approved, letting others know which apps can be trusted.

Currently, the NHS Choices Health Apps Library provides information and links to submitted apps they have reviewed and approved. Their review team includes health professionals and safety specialists who work with the developers to ensure the apps (i) are relevant to English users, (ii) protect user data, (iii) provide trusted source information, and (iv) do not potentially harm the user (e.g. through inappropriate use or instruction). Once approved, the apps are displayed and available for users to add their reviews. Similarly, My Health Apps provides information and links to submitted apps that have been recommended by healthcare communities including patients, carers and non-profit organisations such as charities. These are then reviewed by users on the website.

Apps that have been reviewed and approved are linked on these sites but as yet, there is no ‘kite mark’ or ‘stamp of approval’ that developers can display on the apps themselves. Could these providers, experts, distributors or medical charities offer such an accreditation for patient developed apps?

Some charities have developed and promoted their own mobile apps (collaboratively put together by professional developers, health professionals and patients) including Diabetes UK Tracker app and The British Heart Foundation Recipe Finder app. The charity ‘brand’ is trusted and reputable among users, which could be extended towards patient-developed apps that meet a quality and safety standard. Charities work hard to protect their reputation so anything released with their
branding will of course need to be properly tested and documented, as well as sustained and updated as technology and medical guidelines evolve.

5.2 Support and sustain patient-developed apps

During the Health App Challenge, the team provided patient-developers with information, advice and support to help them in their journey designing and making their own health apps, including money towards the cost of app development. The ‘product’ of the Health App Challenge, was the designs and published apps made by the patient (and teammates) and offered for others to try out and review. However, how do we support them beyond the Health App Challenge? For those who developed apps, how do they sustain them long-term, and for those who submitted designs, how do they turn them into apps after the Health App Challenge has ended?

With expert support these patient-designers/developers (and their teams) could be given the opportunity to actualise their ideas or update and expand their apps. As well as be promoted and distributed with resources available to many charities, technical developers and other organisations.

Facilitating such collaborations requires a platform. The Health App Challenge platform enabled people to register their interests to collaborate with others (online registration form), who were then match-made by email introductions and supported by the Health App Challenge team point of contact. An online discussion forum, or noticeboard type of platform where both professionals, patients, technical developers knew to visit when looking to network and collaborate with others would be an ideal long-term platform.

5.3 Providing a platform for app review

The Health App Challenge offered a platform for app users to voice their opinions about apps they had used, useful for new app users considering trialling new apps and for potential app developers to find ‘app gaps’ in the market. However, as a relatively short-term project, we aimed to find a sustainable, longer-term platform. Existing platforms for patients to view and contribute reviews to, include online app stores (e.g. App Store) and libraries (e.g. NHS Health Apps Library), and charities often provide reviews and news about apps (developed by others) for example ‘The best apps for disabled people’ and ‘Our top 5 charity mobile apps’. However, they often do not include other types of app (that the Health App Challenge included) such as websites and social media sites which can also be useful health self-management tools.

Well established charities or other organisations may be able to host such a review section. With trusted and large numbers of followers, users will be able to find and frequent the review site over time.
Intellectual Property and the Health App Challenge
www.healthappChallenge.org.uk

This section offers detailed explanations and links to useful resources regarding Intellectual Property Rights for your app and design for the Health App Challenge and beyond.

1. Health App Community
2. Definition: What is Intellectual Property (IP)?
3. Protecting your app and design
4. Definition: What is Copyright?
   - Software, written work, music, images & databases
5. Definition: What is a Patent?
   - Software
6. Definition: What is a Design Right?
   - ‘Look and feel’
7. Definition: What is a Trade Secret?
   - Algorithm
8. Definition: What is a Trademark?
   - App name, brand, logo, slogan or company name
9. Definition: What is a Database Right?
   - Database
10. What if someone copies me or I copy someone else?

1. Health app community

The biggest goal for a health app developer should be providing a tool to support and improve patient healthcare and self-management. Wouldn’t it be great if app developers could work together, share ideas, build upon previous work and become a community of people with the same goal?

If developers’ main goals are making an app to help others, then they do not need to be too protective about their ideas, but it is useful to know about the laws of copying others and being copied – known as Intellectual Property Rights. It can be confusing trying to make sense of all the legal terms so we have summarised here the different types of Intellectual Property for specific aspects of an app or design. We also recommend for more detailed information, the Intellectual Property Office’s website.

If developers are happy for others to make use of the work they have created in the spirit of the health app community, but would like recognition for this, they might add the following words somewhere on the app or design. For example:

“As creator of <app name> and its contents (<date of creation>), I, <developer’s name> give permission for its use in further development in the name of improving healthcare for patients, on the condition that it is not used for profit and that you give credit and recognition to me <and my team> for any or all of my app that is used.”
2. Definition: Intellectual Property

Intellectual Property (IP) is the legal term used to describe ownership of an expressed idea. The design or creation can potentially be protected from others copying it in a variety of ways, such as patents, trademarks, copyright, and design rights (briefly detailed below). The idea itself cannot be legally protected, but developers can if they wish, potentially protect (i) names of the product or brand, (ii) inventions, (iii) design or look of your product and (iv) things they write, made or produce.

3. Protecting your app and design

No single Intellectual Property Right can protect your app or design as a whole, and different rights apply to different parts of an app or design. The table below shows which rights are used for which aspects of your app or design.

<table>
<thead>
<tr>
<th>Aspect of an app</th>
<th>Rights used to protect it</th>
</tr>
</thead>
<tbody>
<tr>
<td>Software</td>
<td>Copyright &amp; occasionally Patent</td>
</tr>
<tr>
<td>Algorithms</td>
<td>Copyright, maybe Trade Secret &amp; occasionally Patent</td>
</tr>
<tr>
<td>Written work</td>
<td>Copyright</td>
</tr>
<tr>
<td>Music</td>
<td>Copyright</td>
</tr>
<tr>
<td>Images</td>
<td>Copyright &amp;/or Design Right</td>
</tr>
<tr>
<td>Look &amp; feel of the app</td>
<td>Design Right &amp;/or Copyright</td>
</tr>
<tr>
<td>Databases</td>
<td>Copyright &amp; Database Right</td>
</tr>
<tr>
<td>Name, logo or slogan</td>
<td>Trademark &amp;/or Design Right with Copyright in the design of logo</td>
</tr>
</tbody>
</table>

Protecting your design: Much of what is detailed here about protecting your app also applies to protecting your designs before your app is created. This includes written work, images, ‘look and feel’, app name, brand, logo, slogan and company name. See the boxes (like this one) further down for additional design specific information.

Some rights require registration and fees (e.g. patent), while others do not (e.g. copyright) so please follow the links for more information about each right.

4. Definition: What is Copyright?

Under the UK Copyright Act, a design or creation can be protected by copyright if it is original, which means you must have created it without copying another person’s work. Copyright can
Protect software, databases, written text, music and sound, images (e.g. photos, illustrations and graphics), and audio-visual work. **There is no official registration process for copyright and your work is automatically protected.** Basically, it’s free and you don’t need to do anything. Beware of sites that try to charge you to copyright your work.

When you make your design or creation available it is worth putting a © symbol, date and your name (or company name) so that people are made aware that you are the proprietary owner of the work. For example, “Copyright © Emily Ashurst 2014”.

If you have worked with friends or teammates to make your design or creation and contributed equally, then you might be considered joint copyright owners. If you get someone to create the work for you, then they legally own the copyright unless a contract is signed that states copyrights have been assigned to you.

Just because material is publically available, and especially on the internet, which does not carry a © declaration does not mean you are free to use it. Referencing the source of the material also does not give you the right to use the material unless there is a notice to this effect from the creator.

For further details about Copyright see [https://www.gov.uk/intellectual-property/copyright](https://www.gov.uk/intellectual-property/copyright)

**Software (copyright)**

If you wrote the software for your app, then it is owned by you and is automatically protected by copyright. As above, there is no fee and no need to register (i.e. you don’t have to do anything). If you use existing app frameworks (i.e. an app template) then you must get permission from the original creator. The same applies if you ‘re-skin’ an app (i.e. if you have access to the source code of an app) to use for your app. If you get someone to create the software for you, then they legally own the copyright unless they sign a contract that clearly states copyrights have been assigned to you. If you have worked with friends or teammates to make the app and contributed equally, then you might be considered joint copyright owners. Please be aware that if open source software (i.e. code that is freely available for others to use) has been used or is incorporated in the software, you should check with the terms of the licence to find out what you can and can’t do with it (e.g. you may not be allowed to charge people to use your app if you’ve used open source software).

To prevent other people from copying your software, you can keep your software coding confidential by not allowing access to the source code (keeping in mind that if you get help making your app or if you use open source software this might not apply).

You can if you wish add junk code within your code, so if someone directly copies your coding and your junk code is in their coding, you can demonstrate that your code has been copied.

**Written work (copyright)**

Any original text you write for your app, even instructions, are automatically protected by copyright. Again, there is no need to register and it is free. If you copy text from someone else, you must get their permission to use it first. If someone helps you write original text for your app and want to be sure you have the rights to use it, it is important that they assign or license the rights to you.

**Music (copyright)**

If you write an original tune for your app, then you automatically own the copyright to that tune. However, music copyright can be complex because if you then give the tune to another person to
orchestrate, the copyright in the orchestration will belong to the orchestrator. The artists who perform the work will have copyright in any recorded version of their performance and the producer of the recording will also have rights in the recording. If you want to use any recording you must get the copyright owner's permission. If you contract anyone to create a soundtrack for your app and want to be sure you have the rights to use it, it is important that they assign or license the rights to you.

Images (copyright)

If you include any photographs you have taken, illustrations you have drawn/painted or graphics you have designed in your app, then you automatically own the copyright to these images. As with other parts of your app covered by copyright, if you get someone to create the images for you, then he or she technically owns the copyright unless you both sign a contract that clearly states copyrights have been assigned to you, or you get their permission (i.e. an exclusive licence) to use the images. Be careful of any similarities between the graphics you use and graphics already used in other apps or that are publically available. If characters or graphics are copied and a licence to use these has not been obtained, the original creator could seek to have the app removed by the platform providers and potentially seek damages if they have suffered loss of earnings.

Database (copyright)

If you have created a database for your app, i.e. a system of accessible and organised stored data, and you want to protect it from being copied by others, then it may be considered a type of written work and protectable by copyright. For example if you have a database of images you created, and if the structure of your database (i.e. the content selection process or arrangement) is original and created by you, then this too is protected by copyright. However, depending on the contents and the structure of the database, it may be protected by database rights. For example, even if the content of your database is not original (i.e. not eligible for copyright protection), you might be protected by database rights if there was a great deal of work in the presentation of your database and in gathering and checking the contents.

Protecting your design: Some of you may submit your design as a video demonstration (e.g. via YouTube). Your video (if original) is automatically copyright protected (i.e. the script, music and images you create and include in it) but as before, only the expression of your idea is protected and not the idea itself.

For information about copyright from YouTube [https://support.google.com/youtube/topic/2778546?hl=en-GB&ref_topic=2676339](https://support.google.com/youtube/topic/2778546?hl=en-GB&ref_topic=2676339)

5. Definition: What is a Patent?

Under the UK Patents Act, an invention that is novel (i.e. new and original), inventive and has industrial applicability can be patented in the UK (for patent protection outside of the UK, other applications are also needed). Some things cannot be patented including: a way of performing a mental act, playing a game or doing business, the presentation of information, or some computer programs. Patent protection requires registration and fees and can be rather costly. You must file a description of your invention, explaining clearly how it works to the Patent Office. They will examine the application and decide whether it can be patented or not. If granted, renewal fees are payable and the rights last for 20 years.

For further details about patents see [https://www.gov.uk/intellectual-property/patents](https://www.gov.uk/intellectual-property/patents)
Software (patent)

The rules on software patents are complex with most software not being patentable in the UK and Europe as it is not usually a new invention. However, exceptions can include software that has a technical effect such as software that drives a machine. Different rules apply in America if you want to launch your app in the US and/or on a US based platform.

6. Definition: What is a Design Right?

A design right is a protection from others copying or using a 3D or 2D design by others. As with copyright, make sure the ownership of the design is agreed if you had help with your design. There are four types of design rights that can be applied, but some require registration and fees. These are:

- **Unregistered Design.** This is automatic and has no need for registration or fees. It protects your design against direct copying only and includes the appearance, designs or graphic representations. It is automatically in place when the design is first made available to the public and lasts for 15 years from when the design was created (or 10 years from sale or hire of your design).

- **Registered Design.** This requires registration and fees, and must be registered within 12 months of your design first being made available to the public. It protects your design from others using it for any purpose and includes the appearance, designs or graphic representation and it is also possible to protect decorative patterns and graphic symbols. Once registered, the design will be protected for 5 years and is renewable every 5 years up to a total of 25 years.

- **Unregistered Community Design and Registered Community Design.** These are much like the above, but the protection also extends across the entire European Union.

An example of this is the games character ‘Lara Croft’ which has been protected with a registered design right.

For further details about design rights see [http://www.ipo.gov.uk/types/design.htm](http://www.ipo.gov.uk/types/design.htm)

‘Look and feel’ (design right)

The way your app looks and feels might be very appealing to users and makes it stand out from others. If the overall ‘look and feel’ of your app or design is new and has individual character, then you might be able to protect this by design right. This can include a combination of the user interface, images, layout or any other kind of original visual content that makes up the overall ‘look and feel’.

7. Definition: What is a Trade Secret?

A Trade Secret is something you have designed or created that has commercial value that is known only by you. It might be something that is really unique and not commonly known. Sometimes this information has to be shared with others, such as with investors or people employed to use the information. To help prevent these people copying or replicating the information, A Non-Disclosure Agreement or a Confidentiality Agreement can be drawn up for everyone to sign making it clear that they agree not to take or share the information with anyone else.

Example trade secrets include the Google search engine algorithm and the Coco Cola formula.
Algorithm (trade secret)

The software code of your app will probably include a calculation of some sort (i.e. if this happens, then this happens…), also known as an algorithm. Also see copyright and patent protection for your algorithm.

If you create an algorithm that is really unique, not commonly known, has commercial value and you are concerned that others might copy it, then you can choose to not let others see the details. If you want to keep the algorithm secret, it is important that you don’t make it public and don’t apply to patent it. This is because a secret formula made public is no longer a secret formula. If you need to show the details to anyone (such as a developer or an investor) you should first have them sign a Non-Disclosure Agreement or a Confidentiality Agreement (a written agreement or contract) stating that your software code is a trade secret. Competitors can try to copy the effect of an algorithm, but because the algorithm details are a trade secret, they cannot copy the algorithm itself.

Protecting your design: If you include a detailed algorithm in your app designs that others can see (e.g. on the Health App Challenge website) and you are concerned about others replicating or copying it, you can if you wish only include the rough outline of what the algorithm aims do and not the actual process as to how it works.

8. Definition: What is a Trademark?

A trademark can protect against others from copying or using names (e.g. your name or company name), logos, brands and slogans that uniquely identify your creation or you, the creator (e.g. your brand, your company or you as a developer). It can’t protect any words or images that are offensive, misleading, words that exactly describe the creation (i.e. you can’t Trademark the word ‘App’) or anything that is very common or non-distinctive.

An example of a registered trademark is the NHS logo

There are two types of trademark and these are:

- **Unregistered trademark. This does not require registration or fees** but can be harder to prove that someone has copied you. You can include the unregistered trademark symbol™ next to the name, logo or slogan.

- **Registered trademark. This does require registration and fees** (and makes it easier to prove that someone has copied you). It can take about 4 months to process if there are no problems and lasts for as long as you continue to pay the annuity fees. Before registering your name, logo or slogan you can check with the trademark register to see if it has already been taken at [https://www.gov.uk/search-for-trademark](https://www.gov.uk/search-for-trademark). If your registration is approved, you can use the ® symbol next to the name, logo or slogan.

You can include the unregistered trademark symbol™ next to the name, logo or slogan. But do not use the registered trademark symbol ® if unregistered as this is an offence.

For further details about trademarks see [https://www.gov.uk/how-to-register-a-trade-mark](https://www.gov.uk/how-to-register-a-trade-mark)
App name, brand, logo, slogan or company name (trademark)

If you want users to easily identify or find your app, your brand (i.e. if you have designed multiple apps) or you as a developer, then you can create distinctive names, logos or slogans for this. When choosing a name logo or slogan, it is best to avoid names that are similar and might be confused with other developed apps, or that suggest the app is endorsed by or belongs to an alternative organisation. As with copyright and design right, make sure the ownership of the name, logo, brand or slogan is agreed if you had help with it. You need to make sure that if you have had help with designing a logo, that the use of the logo as a trademark is assigned to you as well as the copyright within the trademark as a work of art protected by copyright.

If your name, logo or slogan includes images you have created, then also see details of copyright, or if the images make up the unique look and feel of your app, then also see details of design right.

9. Definition: What is a Database Right?

Database rights can protect against others copying or using most or all of the contents of a database (i.e. a system of accessible and organised stored data) if a lot of time, effort and/or money have been invested into putting it together. If eligible, these rights protect work for 15 years from when the database was completed or made available to the public. Like copyright laws, there is no registration or fees and you are protected automatically.

Also see copyright for other aspects of a database that may be protected by copyright.


Database (database right)

Your app database may be protected by copyright or database rights depending on the contents and the structure of the database. For example, a database might be protectable by copyright if it is considered a type of written work, if you have a database of images you created or if the structure of your database (i.e. the content selection process or arrangement) is original and created by you. However, even if the content of your database is not original (i.e. not eligible for copyright protection), you might be protected by database rights if there was a great deal of work in the presentation of your database and in gathering and checking the contents.

10. What if someone copies me or if I copy someone else?

If someone copies your work, depending on the level of distress it causes you and what they have used your work for, you can decide to (i) do nothing – what is the worst to happen as a result of this copying? (ii) Contact them directly and request they remove the work they have copied from public view, (iii) contact the company that hosts the copied work and request it be removed from public view or (iv) seek legal advice to take the matter further.

If you have copied someone else’s work (for example copied text from another site, used a photograph/image you found on the internet or any other bits without permission or agreement from the owner), then they have the same options of action as above. They may do nothing or they may ask for your app to be taken down from public view until the copied item has been removed.