

Defining Electronic Health Technologies and Their Benefits for Global Health Program Managers



App Competitions

App competitions are a subset of hackathons (see MEASURE Evaluation's "eHealth Glossary" factsheet on this concept here: <https://www.cpc.unc.edu/measure/resources/publications/fs-15-165e>). They are also known as app challenges. These contests challenge participants to produce computer or mobile applications to meet defined objectives and criteria. Usually, prizes are awarded to participants who develop the best applications.

There are two main types of app competitions:

- (1) **In-person app competitions.** Participants are invited to attend an event lasting a day or several days to collaborate and develop a product that meets the objectives and requirements announced at the beginning of the event. In-person competitions are more commonly known in the technology sector as hackathons, but hackathons are more loosely defined as collaborations to achieve a common goal and may not involve competition. Hackathons that are mentioned in this document will refer to those that involve competition.
- (2) **Online app competitions.** The objectives and parameters of the challenge are posted online and participants have a set deadline to submit a product or solution.

What Can App Competitions Do for Global Health Program Managers?

Health and technology professionals and organizations have started using app competitions as a means to explore a wide range of technology-based solutions

for specific health problems. The hope is that from these competitions, innovations to improve health programs, health systems, and, ultimately, health outcomes will emerge. For example, the United States Agency for International Development (USAID), through its Global Development Lab,

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DEFINITION

App competition: Short for application, "[an] app is computer software, or a program, most commonly a small, specific one used for mobile devices. The term *app* originally referred to any mobile or desktop application, but as more app stores have emerged to sell mobile apps to smartphone and tablet users, the term has evolved to refer to small programs that can be downloaded and installed all at once" (1).

Source: Techopedia, available at <https://www.techopedia.com/definition/28104/app>.



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has sponsored online app challenges related to water sanitation, maternal and child health, and Ebola (2). The Massachusetts Institute of Technology's Hacking Medicine initiative and its partners host healthcare hackathons several times a year in different countries. Examples of winning prototypes from these competitions are the use of Google glasses to help document doctor-patient conversations (3) and add-ons for infant bag valve breathing masks that are cheap enough to be affordable by low- and middle-income countries (LMICs) (4).

The first Kenya Health Hackathon, sponsored by the Social Entrepreneurship Accelerator at Duke (SEAD), was held at Strathmore University, in Nairobi, in September 2015 (5). The event—which the Kenya Medical Association, the Kenya Pediatrics Association, and the Information and Communication Technology Authority (a state-owned corporation) helped to promote—focused on managing noncommunicable diseases, improving the quality of maternal and child health, and increasing access to healthcare, with an emphasis on low cost for

From app competitions, innovations to improve health programs, health systems, and, ultimately, health outcomes may one day emerge.

acceptance by LMICs. The winning team developed a prototype that used QR codes as a unique patient identifier; when scanned, it linked healthcare providers to an integrated health information system that allowed access to patient records for better clinical decision making. Another winning team improved on an existing mobile platform that sends maternal and child health messages to mothers during pregnancy and the first five years of the child's life. Participants in the app competition expanded this mobile platform to include voice messages, too, so the health information can reach illiterate and visually impaired mothers.

Peer-reviewed literature and evidence do not yet exist on the use of app competitions for health. However, MEASURE Evaluation explored gray literature and consulted with people who have led app competitions, to understand better the feasibility of using app competitions

to improve health and more specifically, health systems in LMICs.

The table lists some of the best uses or advantages of app competitions in health and some of the challenges.

App competitions are applauded for being an effective platform for collaboration and networking. They encourage creativity and allow innovators to think of new ways to solve persistent health problems. The prize differentiates an app competition from the more loosely defined hackathon, and often serves as extra motivation to draw out creativity (6). App competitions are also useful when a wide variety of ideas, and lots of them, are needed. Resources are available online to guide the planning and implementation of app competitions or hackathons (7-9)

Public health professionals worry about the sustainability of the applications developed through app competitions—especially the sustainability and feasibility of apps intended for use in LMICs. DePasse, et al. have stressed that “special considerations must be made for technologies developed for LMICs where 30 to 48 percent of health care stems from out-of-pocket expenditure” (4).

Organizers of health-related app competitions should take care to address these concerns. For example, requiring participants to submit a business or implementation plan along with the apps they propose can increase these products' sustainability and scalability. The Consortium for Affordable Medical Technologies (CAMTech) is one association that recognizes the specific challenges of implementing new technologies in LMICs. Its mission is to “accelerate medical technology innovation and build entrepreneurial capacity to improve health outcomes in low- and middle-income countries.” CAMTech hosts app challenges and hackathons along with entrepreneurial training for improved sustainability.

Whether or not app competitions can provide long-term solutions to improve health and health systems in LMICs is unclear, because the apps that have been developed have not yet been thoroughly documented or tested over time. However, the existence of consortiums such as CAMTech, the increasing use of such resources as Hacking Medicine's *Health Hackathon Handbook*, and the growing number of app challenges hosted in LMICs



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Best Uses or Advantages of App Competitions

- Gather a wide variety of ideas for solving a health problem
- Build enthusiasm around a specific health topic
- Encourage innovation for improving health

Challenges of App Competitions

- Effective solutions are not guaranteed
- Often the apps submitted are not sustainable
- Objectives often not clearly defined
- Requires additional resources to finalize apps for implementation

In-person

- Provide a platform for younger professionals to network and collaborate
- Create a strong community around an area of interest
- Bring together people from multiple sectors—e.g., developers and health professionals
- Produce a large and varied set of possible solutions

- Require a lot of resources and energy to run
- Often produce “Band-Aid” solutions
- Restrict the time available for work on solutions

Online

- Allow more time to think about solutions
- Require fewer resources and effort to initiate, which frees up resources for piloting and implementation
- Allow for the option of submitting a concept instead of a fully developed application

- Offer few networking opportunities
- Do not encourage new collaborations
- Give well-established groups or organizations a better chance of winning than other competitors

all suggest the promise that app challenges hold for solving health issues.

For more information on CAMTech, see: <http://www.mghcgh.org/camtech>.

For the Healthcare Hackathon Handbook, see: <http://hackingmedicine.mit.edu/handbook>.

For more information on MEASURE Evaluation, visit: www.measureevaluation.org.

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ALL ABOUT eHEALTH

Electronic health (eHealth) refers to the health sector's use of information and communication technologies (ICT), such as mobile phones, portable and handheld computers, Internet and cloud-based applications, open source software, and data warehouses. Advances in ICT have increased exponentially the amount of data that health information systems can collect, synthesize, and report. Expansion of these technologies in low- and middle-income countries (LMICs) promises to revolutionize the global health sector's response to these countries' most pressing health issues.

MEASURE Evaluation—funded by the U.S. Agency for International Development—seeks new ways to exploit such eHealth solutions as data dashboards and geospatial data analysis, as part of its mandate to strengthen health systems in low-resource settings. Even though health program managers in LMICs—as everywhere—are increasingly expected to use and invest in such strategies, many lack information about how the strategies work and how they can benefit the management of health programs.

To address this problem, we developed this glossary of eHealth strategies most likely to enhance data access, synthesis, and communication for health program managers at all levels of a health system who are eHealth novices. The list has been vetted and revised by an advisory group representing the World Health Organization, the Free University of Free Brussels/European Agency for Development and Health, the University of Oslo, the Public Health Foundation of India, and the National Institute of Public Health Mexico.

The complete set consists of fact sheets on the following eHealth strategies, in addition to this one:

- **Dashboards**
- **Crowdsourcing**
- **Hackathons**
- **Open data**
- **Big data and data science**
- **Geospatial analysis**

In each fact sheet, you'll find the following information:

- eHealth strategies that have been used in health information system strengthening efforts to improve access to and synthesis, presentation, and communication of health data for program management
- How the strategies have been adapted (or not) from their application in resource-rich country settings to health programs in LMICs
- An example of the strategy for global health program management
- Links to additional resources for more in-depth details on the strategies

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