

Moving towards a Tricorder

The future is here! Consumer testing of the Qualcomm Tricorder X-Prize finalists' products will begin later this year. The \$10 million competition, drawing inspiration from the Tricorder device in the Star Trek TV series, seeks to encourage the creation of innovative diagnostic technologies to help consumers diagnose themselves more accurately.

These diagnostic tools will be capable of detecting a number of common ailments in a matter of minutes. Portable and weighing no more than 5 pounds, the devices will enable the consumer to diagnose themselves in the comfort of their own home. This has the potential to completely change the healthcare industry. Early diagnosis means early treatment which can be crucial for a number of diseases, especially those that are highly contagious. Currently there are 13 core indications (including Tuberculosis, Stroke and Diabetes) and 12 elective conditions (such as Melanoma, Shingles and Strep Throat) that the Tricorders are expected to accurately diagnose.

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With our experience of diagnostic systems and Medical Mobile App development, we have been enthusiastically watching the progression of the 10 finalist companies. It is exciting to see the unique ways each group has gone about solving the issue of vital sign monitoring and diagnosis of a range of conditions. Each team has taken a different approach, utilising their individual strengths with finalists ranging from university spin outs and private ventures to publicly funded groups.



While each implementation is unique, a common approach displayed across the teams has been the use of smart phones to analyse, store and report data. One of the key issues with the emergence of 'quantified self,' the self-tracking of an individual's different life metrics, is how to display a complex array of numbers in a simple user friendly format. To address this, the finalists have implemented advanced algorithms and databases to convert the vast data sets that are collected into simple user interfaces. These include displays such as traffic light signals, which alert the user when they should visit a doctor for example.

Another common theme across the group is the use of integrated wearable sensors for vital sign monitoring. We are seeing a large number of companies investing in sensor related projects to develop small, accurate sensors for a range of medical device applications. Each measurement technique has its own advantages and disadvantages, which can have a big impact on the final product. Indeed, several of these finalist products are already commercially available as "fitness trackers" with the ability to integrate with the user's smart phone and upload their vital sign data directly to cloud servers.

ate however, many have not gone through the lengthy FDA approval process, which requires documentation

of the device development. This could mean we will not see these devices used for their full potential for some time to come.

Finally, for conditions that require analysis of bodily fluids, there are some really amazing “lab on a chip” solutions being developed by the finalists. These are able to analyse a single drop of blood in a number of minutes or hours. This will come as a comfort to those with a fear of needles.

While many of these devices are not designed to replace the doctor, they will provide additional information and allow the patient to take more regular measurements themselves and play a more active role in managing their own health. The potential uses include not just at home, but could be vital for people in remote locations or even those working in space.