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Application engaged research

Our exponential growth is not only because of Moore's law but because of the rapid cycling and resulting tight coupling of invention and innovation …of capability and functionality

Medical colleagues call their version "translational research"…but their iteration cycles take 10-20 years

Grounded abstraction is healthy for the field…

Jim Waldo: called for us to imagine the solutions not the problems

Judea Pearl: to a PhD student: “That your approach is generalizable does not release you from the responsibility of showing us one thing it actually does”

Margaret Martonosi: on co-innovation commented that this sort of work is about “taking turns”…not trying to innovate on the how and the what at the same time

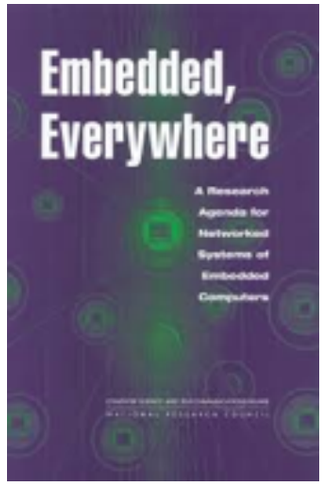
1998 ISAT Study

TinyOS

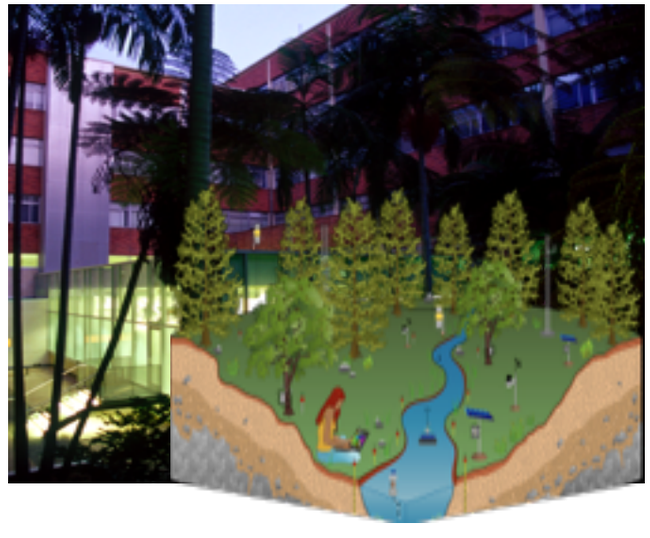
DARPA

SenseIT, NEST

2001 NRC Study



2002-12 NSF STC: CENS



- DARPA ISAT study
- DARPA SenseIT program
- DARPA NEST funded TinyOS which brought coherence to that community and helped us move forward
- NRC Study
- NSF/CISE Programs were sometimes less domain engaging…whereas programs enabled community to engage domain experts in authentic iteration between specificity and generalizability…
- CENS: Center scale (STC) funding lead to coherence of the problems we tried to solve…and techniques developed: statistics as a core discipline, human in loop/hybrid computation, imagers as sensors, and mobile sensing

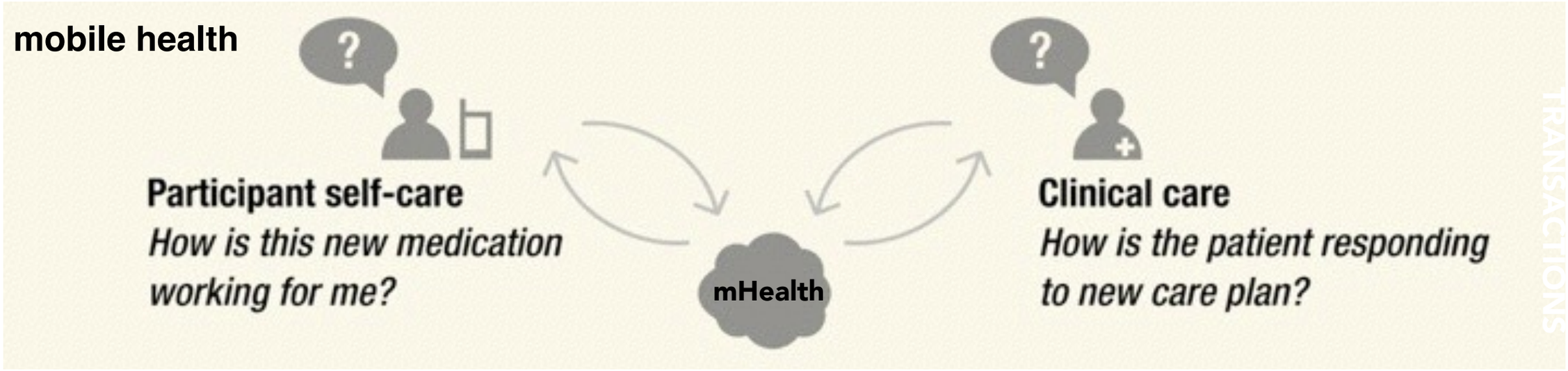
- University research has the scope of interest to bring domain experts together to solve big problems

- But its hard to create product/artifact without committed funding and without product reality cant push back

- Govt funding also is the best actor to push the community to pursue Modular architectures with shared tools (BSD Unix, TCP/IP, Browsers, and Databases, CV, R, TinyOS)

- Univ can take on problems of scope and application that extends beyond the incentive structure of individual product/company/or industry sector profit maximization—Healthcare is a clear example—and float all boats higher

mobile health



small data ecosystem