CATEGORY: ENTREPRENEUR

Virtual vs. Reality

The Computer as a Companion

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some men just want to watch the world burn

some men just want to watch the world learn

some men just want breakfast

-- “Some Men”, computer-generated poetry, at http://botpoet.com/poem/some-men/

The history of human social development is essentially the history of human scientific and technological progress. Humanity achieves scientific and technological progress by pushing its physical and mental limits and breaking away from the restrictions of time and space. In the course of our scientific and technological development, the computer has been an epoch-making development, and has brought us into the information age through data processing capabilities that far outperform the human brain. As we meander through this new world, today’s digital wonderland brings us many new offerings as well as challenges. Is the computer our new overlord, our saviour, or simply, a new colleague?

Hype vs. reality: What are computers capable of?

In the popular American animated series, “The Simpsons”, Bart and Lisa’s Military School Commandant delivers the following valedictory address:

“The wars of the future will not be fought on the battlefield or at sea. They will be fought in space, or possibly on top of a very tall mountain. In either case, most of the actual fighting will be done by small robots. And as you go forth today remember always your duty is clear: To build and maintain those robots.”

In popular culture, the idea of a post-human-led society in a popular one, where every task is automated by a computer, and there are no jobs, and in a sense no purpose, for human beings to cling to. Nevertheless, MIT computer science professor Rob Miller, in his book "Dancing With

Robots: Human Skills for Computerized Work", discusses at least three types of work that humans do really well but computers just cannot (yet):

1) Unstructured problem-solving: There are several problems for which rules simply don't exist. Authors, poets, doctors (diagnostics), lawyers, and most scientists perform functions in ways that do not and cannot adhere to watertight algorithms.

2) Acquiring and processing new information, deciding what is relevant in a flood of undefined phenomena. This is something that we, as human beings, deal with every day. Could a computer have observed dandelions and burrs sticking to dog fur and invented Velcro from it?

3) Nonroutine physical work. Relatively simple, routine tasks like cooking a daily meal, cleaning around a house or office, driving through an urban area, and even applying make-up, are actually relatively complex combinations of actions and responses in three-dimensional space. Even after several advances in information technology, we are yet to design robots with human-like proficiency in such areas.

Thus, what we see is that computers cannot be reasonably expected to master high-skilled knowledge work and low-skilled physical work, and are mainly replacing workers in jobs which can be automated. Such "middle-skill" tasks, such as selling travel tickets, dispensing cash from bank accounts, or receiving and recording calls and messages, are increasingly being performed by machines, leading to, in the words of David Autor of MIT, a "hollowing out" of the labour market.

Can Technology Save the World?

If you work in the development sector, you have certainly heard about the wonders of ICT4D (Information & Communication Technologies for Development). In fact, even if you are not a development professional, you're still likely to have read headlines like "Village Kiosks Bridge India's Digital Divide" (The Washington Post) or "Kenyan Farmer Lauds Internet as Saviour of Potato Crop" (BBC), and praised the efficacy of technology for the rise of the developing world.

Technology in general and ICT in particular has sparked hopes for closing the development continuum gap between the Global North and South. And for good reason too.

ICT4D projects aimed at improving the state of agriculture have seen traction in India as well as Africa, and telephonic hotlines as well as mobile apps to give tips, weather predictions, and commodity price data, among other chunks of information, have proven to be useful among first-

moving farmers. In fact, Digital Green, a celebrated project in India, made waves by recording and disseminating productive agricultural practices to smallholding farmers via locally-made how-to videos. Not only did they have a greater rate of success than "analogue" projects with similar aims, but they were also much more cost-effective, and have been dubbed as "the farmers' Facebook" locally.

Microfinance institutions (MFIs), rural healthcare projects, and social security interventions have seen great success from adopting ICT tools and mobile applications in their respective development programs. Similarly, governments, NGOs, corporations, and local stakeholders across the Global South want to see more and more computers in impoverished communities. Telecenters mushrooming in low-income urban and rural communities across South Asia and Africa are delivering telemedicine and distance education to poor users, as well as helping local entrepreneurs. As the One Laptop Per Child (OLPC) project puts it, "When every child has a connected laptop, they have in their hands the key to full development and participation. Put this ultra-low-cost, powerful, rugged, low-power, ecological laptop in their hands and contribute to making a better world."

In fact, OLPC has such a deep-seated belief in the usefulness of low cost computers for promoting education, that in November 2011, it announced plans to drop touchscreen computers from helicopters near remote villages in developing countries. The devices will then "be abandoned and left for the villagers to find, distribute, support, and use on their own." This is where the development-through-digital narrative starts to fall apart.

Technology's effects are wholly dependent on the people and organisations handling it. Computers in schools produce measurable improvements in educational outcomes only when given supportive administrators and dedicated teachers. Great MFIs led to great microfinance apps. Digital Green's access to agricultural expertise and their devoted outreach efforts made the project work. As UC Berkley Computer Scientist Kentaro Toyama succinctly puts it, "Technology—no matter how well designed—is only a *magnifier of human intent and capacity*. It is not a substitute."

It needs to be understood that technology has a multiplicative impact, not additive. Thus, ICT cannot inherently contribute to social change and international development: The intended beneficiaries have to be willing and able to use it, and the opportunity cost as well as well-intentioned capability has to be met by the enablers and middlemen.

In OLPC's case, their vision of "self-empowered learning" with teachers altogether absent ignores the realities of pedagogy. While their stated mission is "to empower the world's poorest children

through education," the program ignored the need to train teachers, redesign curricula, strengthen school systems, or even make provisions for technical maintenance of their devices. The same is true for opening telecenters as a way to alleviate poverty. Villages and urban areas with ready access to internet-connected computers see their dominant usage as devices for young men to play games, watch movies, and consume adult content.

Disseminating information technology is a great idea, but expecting mere hardware to magically transform everything all by itself is simply delusional.

What can we do with computers, then?

Closing the development gap

Given technology's role as magnifier, it is imperative that greater deployment of unaided technology will result in greater benefits to the one with greater capacity to begin with. That is, rich get richer, and poor get poorer.

However, if the mechanisms through which technology's transformative potential is harnessed can be understood, it can indeed be a force for greater good. The first and foremost obstacle that Tech4D interventions face is the lack of access. While the rich and affluent have money to spend not only to acquire, but also to operate, maintain, and upgrade the latest in gadgets and gizmos, the poor don't. Even the best of apps and free resources cannot reach intended recipients for the lack of devices. In fact, most devices themselves are made by corporations keeping the first world target market in mind. While the situation is rapidly changing, most software as well as hardware in the world is not made to withstand the dust, heat, as well as the linguistic and cultural barriers that exist outside of air-conditioned offices and Wi-Fi-enabled coffee shops.

While projects such as the aforementioned OLPC may fight differential access, differential capacity still remains an issue. Merely access to a 3G-connected smartphone will not enable the average Moroccan slum-dweller to do what I could do with it. Education, skills, and network: a whole ecosystem of capacity needs to be in place to allow technology to do its work.

And then there is differential motivation: if given access to the technology, and the capacity to use it, what **can** one do with it? Out of the world's estimated 7 billion people, 6 billion have access to mobile phones (while only 4.5 billion have access to working toilets). These 6 billion include more than half of India's population, a country suffering from high levels of inequality in access to education, healthcare, and financial services. And yet, what use are these mobile phones most often

put to? It is to download music videos and adult content, and not, as we development practitioners like to believe, for downloading educational apps, mhealth content, or microcredit interest calculators.

The problems with Tech4D interventions thus stem from the assumption that the human intent and competence that make them useful are already in place. Thus, development and IT professionals must take into account the motivations and abilities of organizations and workers who are to implement Tech4D projects.

Like most projects aiming at social change, building institutional capacity is a must for any application of technology to have any value. To go back to Kentaro Toyama, "disseminating technology is easy; nurturing human capacity and human institutions that put it to good use is the crux."

Thus rural healthcare can be greatly aided by technology, but healthcare professionals must still be adequately trained and paid, and clean water and sanitation systems must be put in place. Education, similarly, requires millions of dedicated and trained teachers and school administrators. These same education and health professionals, given access to computers and mobile phones, and adequate training, can enable the rise of the global south, and it is them we should invest in, not laptop-dropping helicopters

The Data Revolution

This is the age of Big Data. The meteoric rise of digital technologies has changed the global landscape vastly over the last decades, and billions of devices across the world continuously feed data to corporations, governments and civil society actors. This technology-driven shift in the way people create, curate, share, and apply data is increasingly being reflected in all aspects of our lives. Beyond its commercial applications, more (and more reliable) data could improve decision-making by helping policymakers understand social, economic, and environmental issues, and making such data open and accessible is thus viewed as a basic condition of ensuring people's ability to hold governments accountable and thus participate in decisions that affect their lives.

However, the size and complexity of these datasets require specialized analytical skills, which remain in short supply, as well as more research and experimentation. Increasing the quantity, quality, availability, and usability of data for development requires addressing the market failures that lead to gaps in data use and coverage in developing countries. This means that as technology, data, and data users and providers make rapid advances, cooperation among diverse actors – governments,

national statistics offices, donor agencies, global and local NGOs, academic and research institutions, the private sector and others – will be needed.

Computers as Collaborators, Colleagues, and Partners

Thanks to the Internet, a large number of borderless virtual communities and societies have come into being, and are forming digital societies that transcend borders, cultures, and races. In fact, Facebook is home to over one billion users (or netizens), is effectively the third largest "citizenry" in the world.

As technologies change the way people communicate and work, they are also changing the way we live and our nature of work as we go along. Once again, visions of a “post-employee economy” where every task is automated by a computer hit us. But instead, it is more plausible to consider the relationship between human and machine as symbiotic.

For example, if you consider most of the celebrated success stories of the internet age, such as Facebook, Twitter, or Wikipedia, it wasn’t so much that their founders came up with unique ideas, but they rather came up with systems through which other people could express ideas.

The digital wonderland is thus providing tools mean because of which distance and scale now matter a lot less than they used to. Amazon's Mechanical Turk is a similar example, where workers outsource to an online community the projects that computers, alone, can't accomplish.

Computers are just not our new middlemen, but also, possibly, our colleagues and business partners. In fact, Hong Kong based venture capital firm Deep Knowledge Ventures (DKV) has already appointed a machine learning program to its board. Called VITAL, it's an "equal member" that will uncover trends "not immediately obvious to humans" in order to make investment recommendations. VITAL (Validating Investment Tool for Advancing Life Sciences) works by poring over massive data sets and applying machine learning to predict which life science companies will make successful investments, and is treated as a member of the board with powers equivalent to the human board members.

We also need to realise that after outsourcing the routine and menial to our cyber counterparts, the role of the human will not be to be an employee, to be a small part of a bureaucratic machine, but instead it will be, to be a human being. We no longer have to be dispassionate, depersonalized or neutral, but instead explore our creativity.

Social and cultural understanding, for example, will remain out of bounds for computers. Understanding new slang, making the next viral video, or creating that Euro-Indian culinary fusion, is something that an algorithm won't ever be able to catch up to.

Being empathetic, taking care, being artistic, expressing emotions, and making people laugh, and cry, is something that only we can do, and that perhaps will be among the only functions we'll have to do. The human touch is indispensable, which is the most profound reality of the digital wonderland.