#DISRUPTDEVT

Beyond Vocational

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USAID FROM THE AMERICAN PEOPLE

fhi360 THE SCIENCE OF IMPROVING LIVES

ADVANCING THE FIELD

Four Disruptive Assertions

The great majority of Vocational technical education as it is currently organized and being delivered—in this country and in developing countries—is hopelessly outdated and obsolete.

The idea that everyone needs to and will have a job is also obsolete.

The idea that there is different education for the people who think and those who make things—and the class distinctions that accompany this divide—is an artifact of the Renaissance and the industrial revolution. And it's time to give that one up.

The idea that government ministries such as labor and education can act autonomously is also obsolete.

f I had a hammer...

"We must do away with the absolutely specious notion that everybody has to earn a living. It is a fact today that one in ten

thousand of us can make a technological breakthrough capable of supporting all the rest. The youth of today are absolutely right in recognizing this nonsense of earning a living. We keep inventing jobs because of this false idea that everybody has to be employed at some kind of drudgery because, according to Malthusian- Darwinian theory, he must justify his right to exist. So we have inspectors of inspectors & people making instruments for inspectors to inspect inspectors. The true business of people should be to go back to school & think about whatever it was they were thinking about before somebody came along & told them they had to earn a living."

Richard Buckminster Fuller (1895 – 1983)

Maybe a Chainsaw…

"Breakthroughs in IT are proving to be a decisive, disruptive innovation changing how we deploy robots. The manufacturing process is now altered not by retooling production lines but by reprogramming machines with improved software—and in particular, by giving them the power to perform a complex series of actions.

When we place these changes in the context of other rapidly accelerating innovations—in speech recognition, vision sensors and wireless networking--it's clear we are reaching an inflection point, when actions hitherto thought impossible to perform by machines become actions which it's increasingly obsolete to leave to humans."

--Thomas Friedman, NY Times, Jan 2013

We're in a New Machine Age

Machine Age

irst Machine Age

- All inventions required humans to make decisions about them
- This made human labor and control important
- Labor and machines complemented each other

econd Machine Age

- Automating more and more cognitive tasks
- Automating more of the control systems that determine for what to use that power
- In many cases, artificially intelligent machines make better decisions
- Humans and software-driven machines are becoming substitutes, no longer complements to humans

Powered by Three Huge Technology Advances

- **Exponential** – the king and grains of rice and doubling of digital computing power every 2 years
- **Digital** – cars that drive themselves, Watson beating humans in Jeopardy, flexible factory robots and smart phones that have the capacity of supercomputers a generation ago –
- **Combinatorial** – when you add the internet to the first two you get the ability to broadcast digital data about most everything over the net so we can

Combinatorial Electricians

Energy advisor, controls power and data

Project manager, commissioning and integrating systems to optimize energy savings

Requires greater knowledge of other trades – integrating and troubleshooting

Installers will connect systems and components

ills required won't be traditional core skills, but an derstanding of commissioning procedures and intenance. Their skills will be intellectual rather n physical, not so much knowing the answer, but owing where to go to get the answer. They will ed to understand the sustainable implications of oducts, their lifetime cost as well as technical tallation aspects."

021 Vision, Electrical Contracting Industry)

Combinatorial Plumbers

Change in how work gets done

"The next generation of his ompany's products will feature reater use of thermostatic mixing alves to ensure more reliable emperature, in the range of 3-5 ercent variation, as well as new-eneration capacitive sensing echnology. Managers also can expect xtures that incorporate photovoltaic echnology. This implies the need for ontinuing education and lifelong earning."

Change in skill needs

Specific great video:

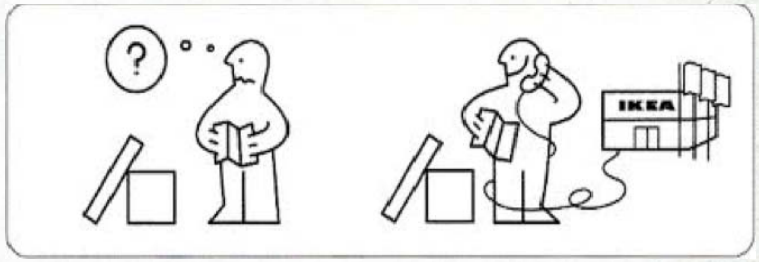
Combinatorial: Construction Workers

ite level work happens in self managed eams (reduces costs of traditional upervisor) and requires holistic nderstanding of the different tasks and oles due to interconnectedness of supply hain unforeseen problem easily spreads own the supply chain.

he trades will need to be multi-skilled to ead drawings, understand construction rinciples, health and safety, organization nd supervision.

Good levels of numeracy, literacy, ommunication on site. The proliferation of T in construction products and processes vill require ICT and communication skills.

Planning and management skills, sustainable construction processes, adoption of new technologies



- BIG TRENDS: off site mfg with assembly only on site

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Future Role of Government…and Donors?

Skills are the currency of the 21st century (OECD)

Role of government ministries from control and delivery of services to enabler/provider of incentives

The role of accountability systems that allow for global competitiveness

Quality measures

Certification

Qualifications frameworks

"Since the Renaissance, dominant education models have had a strict separation between first, what is regarded as learning, and second, training people to make things. This separation has helped to generate and perpetuate class divisions. We've had intellectual castes and the castes of those who make things.

This has ended!! We can reunite making things with the training of the intellect. We need to ensure that practical, technical and vocational education is integrated with academic learning to make both more compelling for all students in our schools, and more valuable in the new labour market."

-UK Secretary of Education 2014

Siemens Apprentice

Vocational Training in DRC