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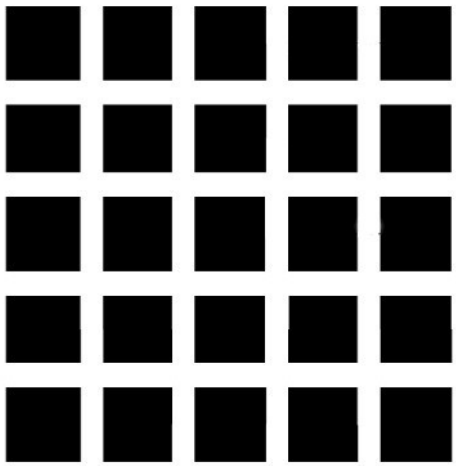

This image tells you something that no computer will ever be able to see.

Knowledge is contextual. We see and know what there is because there is a context of meaning that remains in the periphery and out of focus.

Because of that, it is difficult to digitize knowledge. Computers and information systems normally process only the focal and articulated part of knowledge, thus missing its meaning.

When we try to store knowledge using computers, much of that context resides in our physical and social environment; in tools, architectures, designs, expectations, routines, social arrangements, and conceptual systems. To make sense of computerized knowledge, we need a lot of knowledge.

A child learns by borrowing eyes, ears, hands and sense-making capacity from his or her parents. Novice open source software developers become experts by seeing what the others have learned and by participating in their learning processes. Nobel laureats get Nobel prizes by working with people who already have one.

Skills and knowledge do not reside in individual heads or bodies; we borrow cognitive capabilities from our social and material environments to get things done in a competent way. In the process we learn.

This is why the social dimension of the Internet is critically important for learning and why the net is a revolutionary force. Internet is built from computers and it moves bits, but it is not a data processing system; it is a communication medium. Yes, it allows representation of explicitly articulated knowledge in WikiPedia, dictionaries, encyclopedias, and textbooks. But is also creates meaning through interaction and dialogue, and shifts was was in the periphery to the focus and to the center. It also creates and sustains social networks that can be dynamically mobilized when skill, knowledge or capability is needed. It creates a social system where knowledge can become relevant and productive and where innovation can happen.

Technology, however, in itself does not generate any specific outcomes. For many

decades now, people have tried to change education and learning using computers. They have often failed. Often the failures have resulted from wrong pedagogical beliefs, for example, that learning is about pouring explicit knowledge from a textbook or a teacher's mind to a student's head. Often, however, the failures have resulted from misunderstanding the nature of technology.

Here I can speak from personal experience.

Computers and other ICTs are what in economic terms could be called composite goods. You can invest as much as you want in computer hardware, but the investment only becomes productive if you make complementary investments in software, skills, incentives, institutions, ways of doing things, and systems of meaning. To create useful outcomes with technology, you have to change the context.

Computers and information processing are now cheap, and their quality-adjusted prices have been dropping about 20 percent every year for the last four decades. It used to be the case that in successful information system projects you had to allocate about 80 percent of resources in people and change management, instead of technology. And that you used to underestimate that by about 80 percent. Now the numbers are probably closer to 90.

When the economy and systems of production are increasingly driven by innovation, the world becomes a turbulent place. The emerging world increasingly requires constant innovation and continuous knowledge creation. Educational systems and institutions—which at present reflect the requirements of the Industrial Age—need to be redesigned.

Why, then OER and collaboration are important?

Open platforms for collaboration enable socially distributed and continuous learning. They also facilitate social and innovative knowledge and meaning creation. This is about a new and different way of learning. Or more accurately, learning has always been like that. It is just that, during the last two centuries, education could not be organized very effectively because of practical limitations, and because the Industrial Age systems of schooling had many other objectives than learning. This is why open collaboration platforms will eventually revolutionize education.

In the long run, the objectives of educational systems will change. In the Industrial Age schools provided predefined skills and competences, and produced decent

citizens that can work in factories and keep systems of production running. In the networked world, educational systems will increasingly aim at making nations and societies more intelligent and creative. In the future, educational systems will be increasingly about society-level improvements in sense-making, knowledge creation, and intelligent action.

Open educational resources and platforms are the way of the future because they allow those types of learning processes that are increasingly dominant in the future, and already today. Learning will be increasingly peer-based, social, interactive, distributed, continuous, and contextual, and its focus will shift from the upstream knowledge sources towards downstream pools of meaning. Recent innovation research has highlighted this same shift towards downstream and noted, for example, the extraordinary speed at which competences can develop in open collaborative environments.

The OER movement, however, is simultaneously both ahead of its time and stuck in the past. The problem is not really about improving the quality of content that is distributed freely using collaboration platforms. Instead of optimizing current content and current educational systems we need to rethink the social role of educational institutions in the emerging networked world. To get useful outcomes from OER and to make it productive, the focus needs to be on transforming educational institutions, teacher training, and incentive systems, and aligning them with the logic of the emerging networked and innovation-intensive world.

Indeed, OER is a revolutionary force. But it also needs a revolution to become real. Innovation and creative destruction require a careful balance between stability and change. This can only be accomplished by visionary leadership and broad engagement by all the stakeholders.