# Analogue Literacies

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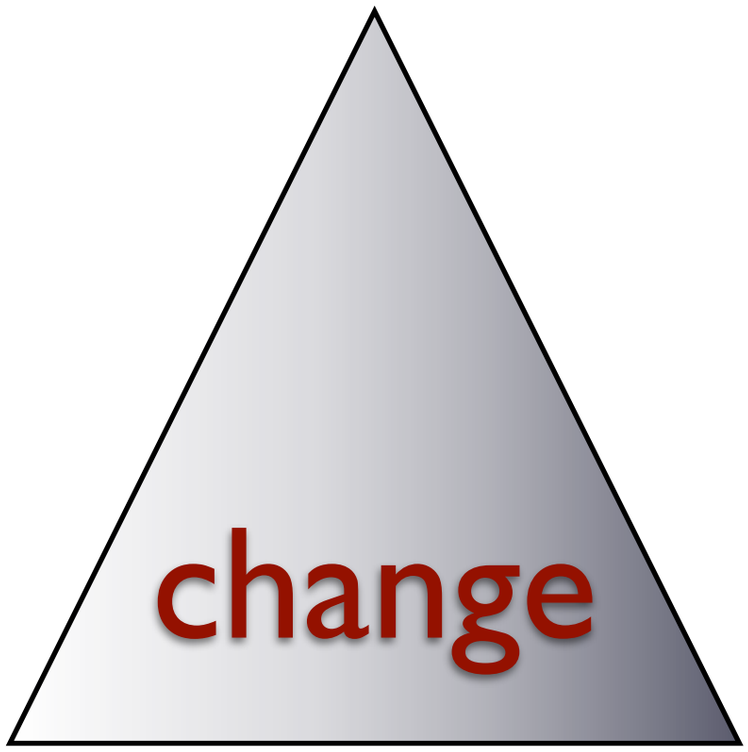
# Rough plan

1. Some problems with the concept of ‘digital literacy’
2. The nature of technologies
3. Discussion of the design and evolution of technologies

# Three related problems with digital literacy




evolution

Diversity

- Change
  Digital literacy is a moving target

- Diversity
  A very broad range of skills and technologies

- Evolution
  Difficult things become trivial, but bring new and different problems

# Change


http://commons.wikimedia.org/wiki/File:Hollerith_card.jpg

Digital skills are not durable like (say) reading, writing, arithmetic, music, physical skills etc. In fact, it's worse than that – they are becoming redundant at an increasing rate. This leads to ever-increasing diversity...


Digital skills are becoming more and more diverse – there is no such thing as a single kind of digital literacy. In fact, there are millions of potential digital literacies.

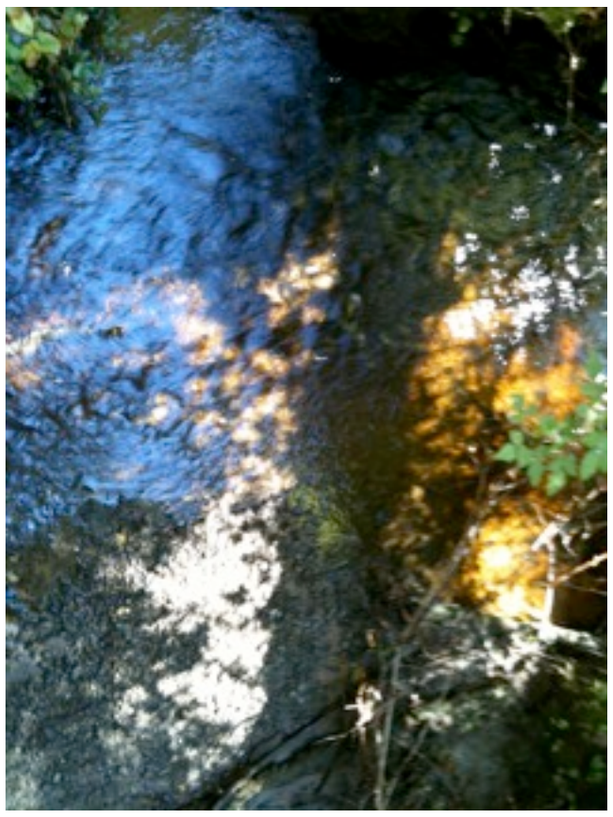
Worse still, this is an accelerating trend – because each new technology increases the adjacent possible and can be assembled with other technologies, change is becoming much faster all the time.

# Evolution


Not only is there increasing diversity but the kind of technologies are changing too. Greater complexity does not mean greater end-user complexity: the vast majority of technological changes in digital systems are to do with making things easier, so hard-earned skills in older technologies no longer have value. But we need new skills with each new technology and, especially as large scale social systems lead to unexpected effects (more is different) there is nobody who is sufficiently expert to guide us or, if there is, it is very hard to distinguish them from those without such expertise.

Older skills become redundant as technologies improve but, as they do, they change the surrounding ecosystem and create new challenges and needs for different kinds of literacy.

# The adjacent possible



# The adjacent probable

Kaufman talks of the adjacent possible - as changes occur within a complex system they open up new opportunities for further change/ Some authors talk of affordances - what becomes possible and enabled with different technologies, but it is also about constraints - as we open up new avenues, some of the old ones close off or become redundant. For instance, a digital image or piece of music is often worse in objective terms than its analogue counterpart.

It is also important to note that, while possibilities may be opened up, not all are equally probable. Technology, as Kevin Kelly notes, has a direction: it encourages certain actions and discourages others, even when they are equally possible. A learning management system *can* be used in an open manner without courses and classes and similar structures, but it encourages people to use it in a fashion for which it was designed.

# Nothing special about learning skills in digital technologies?

- Digital tools are just tools: there is nothing special about them apart from range, diversity and rate of change
- The problem is therefore exactly the same as for all other skills - just magnified
- The adjacent possible means we are faced with an increasingly impossible task if we try to cater for even a small subset - the goalposts move as soon as we reach them
- No one is an expert or, if they are, we cannot distinguish them from non-experts
- The main skill needed is to learn new things better and faster.
- connectivist approaches are well suited - we are concerned with making connections, finding sources of knowledge, staying abreas of developments, knowing who to ask... but this is true of all knowing.
- Is there a solution specific to digital technologies? Maybe. We need to better understand the nature of technologies, how they develop, what kinds of things they can do, how we can make them easier to accommodate
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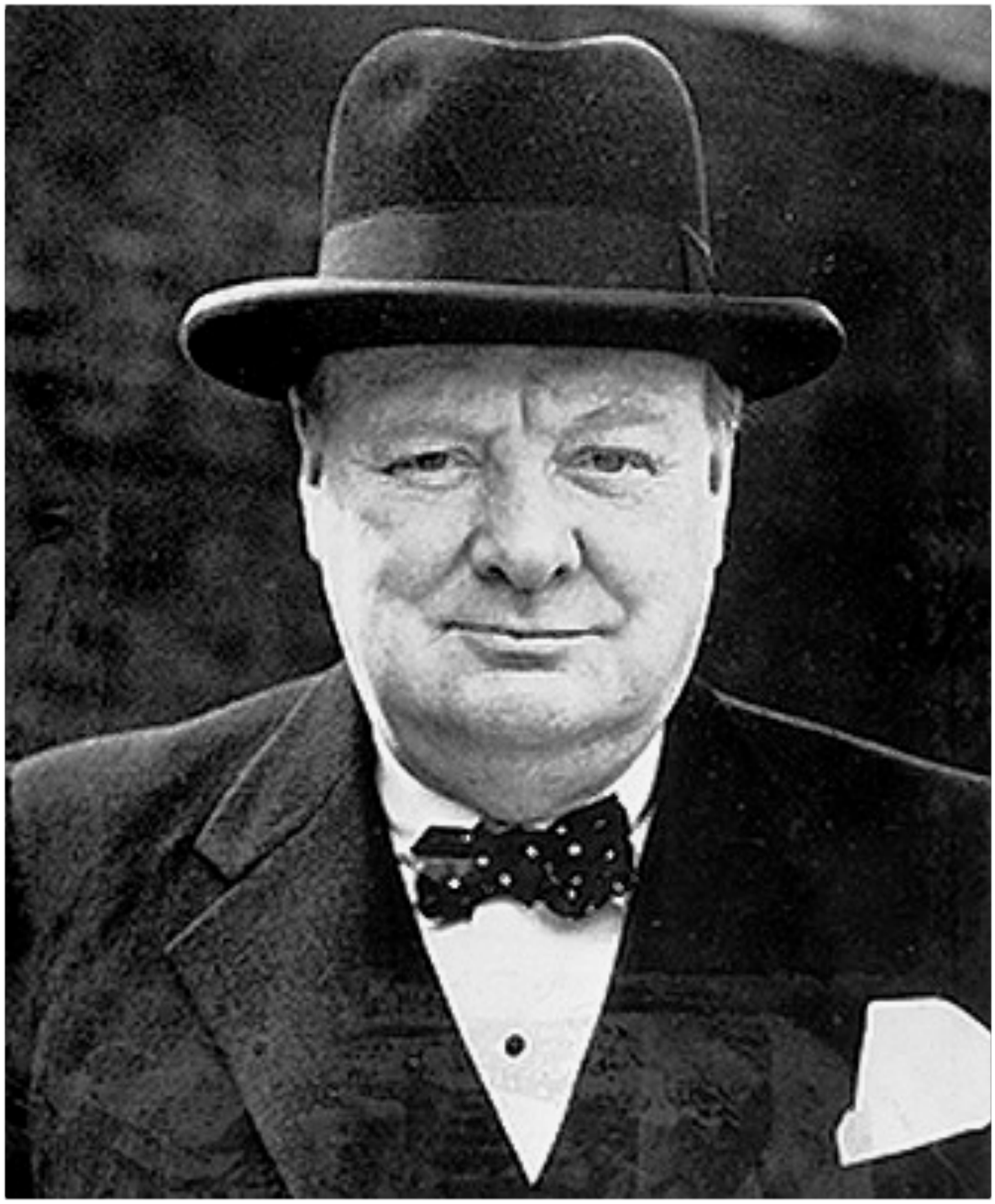
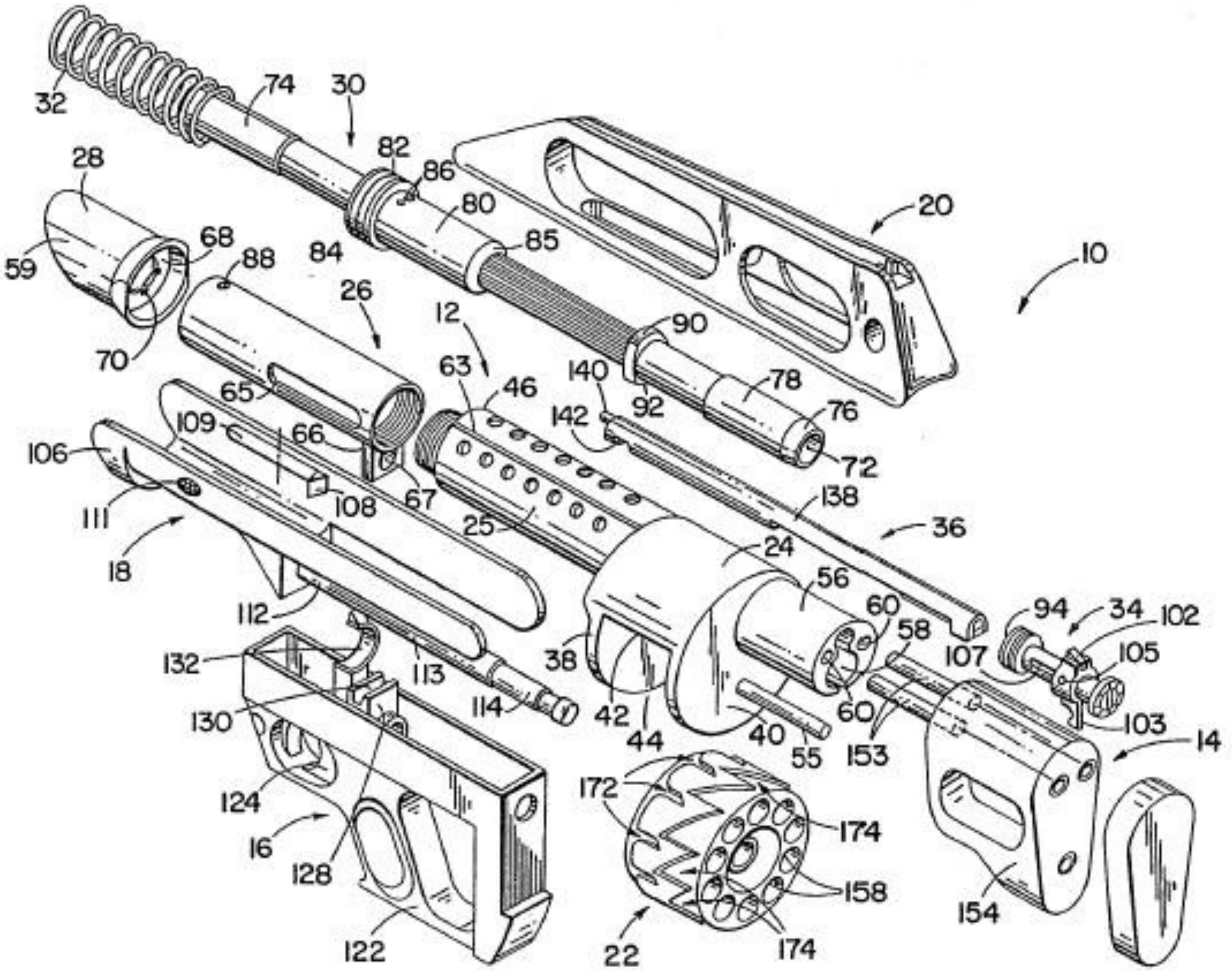
A different perspective: don't try to change us - try to rethink our tools instead

We shape our dwellings and afterwards our dwellings shape our lives



or, as McLuhan put it, we shape our tools and they shape us.
If digital literacies are a phantom, fuzzy, moving target, then how about looking at how technologies themselves are constructed so that we can master them, rather than being mastered by them?

What is a technology? Is a stick a technology?
A stick is not a technology in itself - it becomes one when we add processes to utilise its properties for a purpose.
Try to think of uses for a stick that would make it into a viable technology - given time, you will come up with hundreds, especially if you allow the stick to be combined with other objects.
W Brian Arthur defines a technology as a phenomenon put to use. It follows that technologies do not have to have a physical embodiment - business processes and even prayer may use and be technologies. This is also, incidentally, true of pedagogies which are as much technologies as a learning management system.




all, or almost all, technologies are assemblies (says W Brian Arthur)

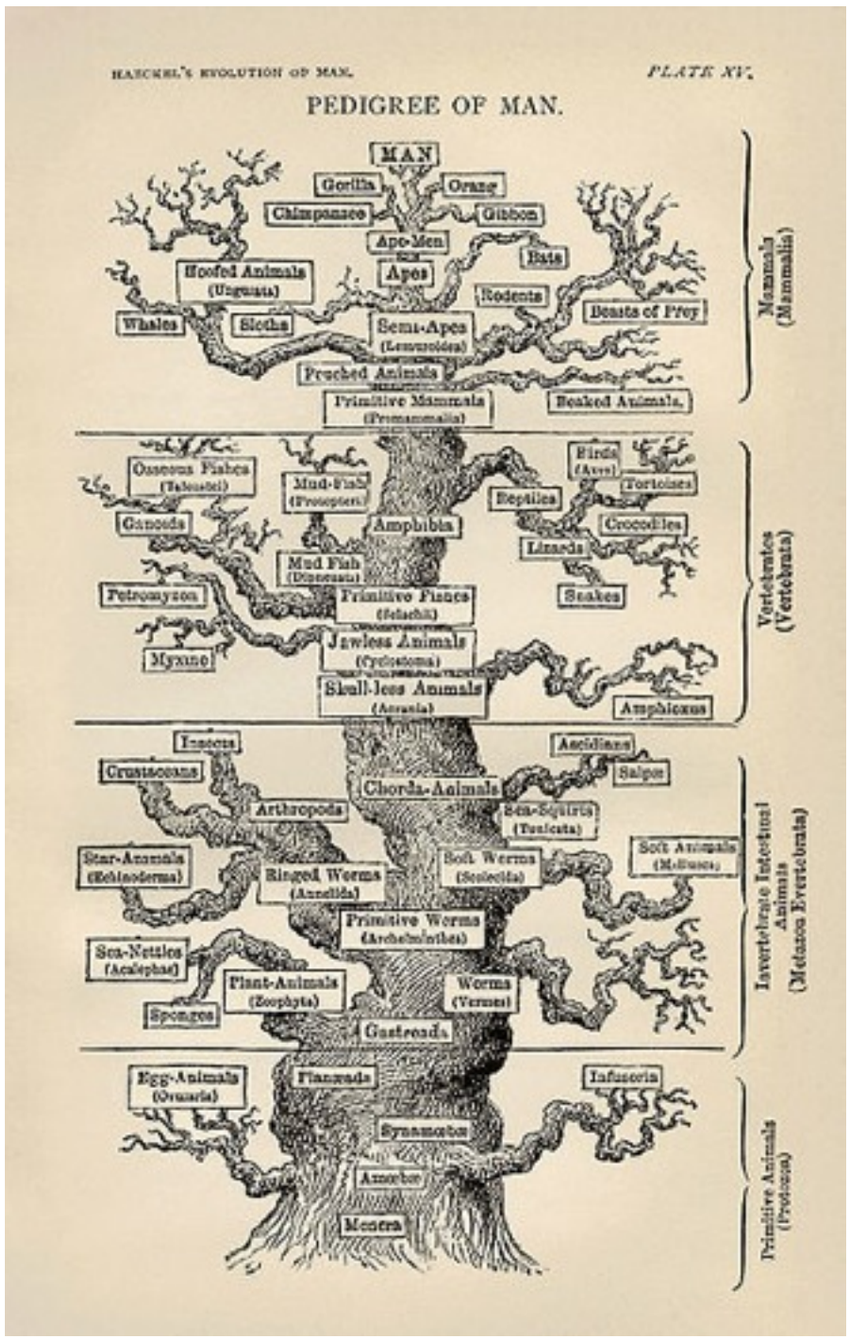
Technologies are assemblies. As a species we learned to use the things around us to build other things. Language was probably the best invention for that as it let us build ideas upon ideas - conceptual structures that themselves could be used to build bigger, better structures but we see the pattern in all technologies. We use technologies to make technologies and assemble, disassemble and reassemble constantly and continuously. The more we create, the more we are able to create. But sometimes we create technologies that make things easier at the cost of inflexibility. Factories, rigid processes, mass production methods, rules, laws.

# Soft and hard technologies

So, a technology can be simply a process, and/or embodied in tools or tools, and is almost always an assembly of more than one technology.

These pictures show somebody knitting with knitting needles and a factory producing knitted garments. The one seems to involve more technology than the other, but is that really so? The technological processes employed by the woman knitting are very rich, involved and complex - perhaps even more so than the simplified algorithms embodied in the machines.
The examples are used by Ursula Franklin when she talks of holistic technologies (those that enable us to expand as human beings) and prescriptive technologies (those that force use to play roles subservient to the ‘machine’. I will be describing these extremes as examples of soft and hard technologies.

# Softness



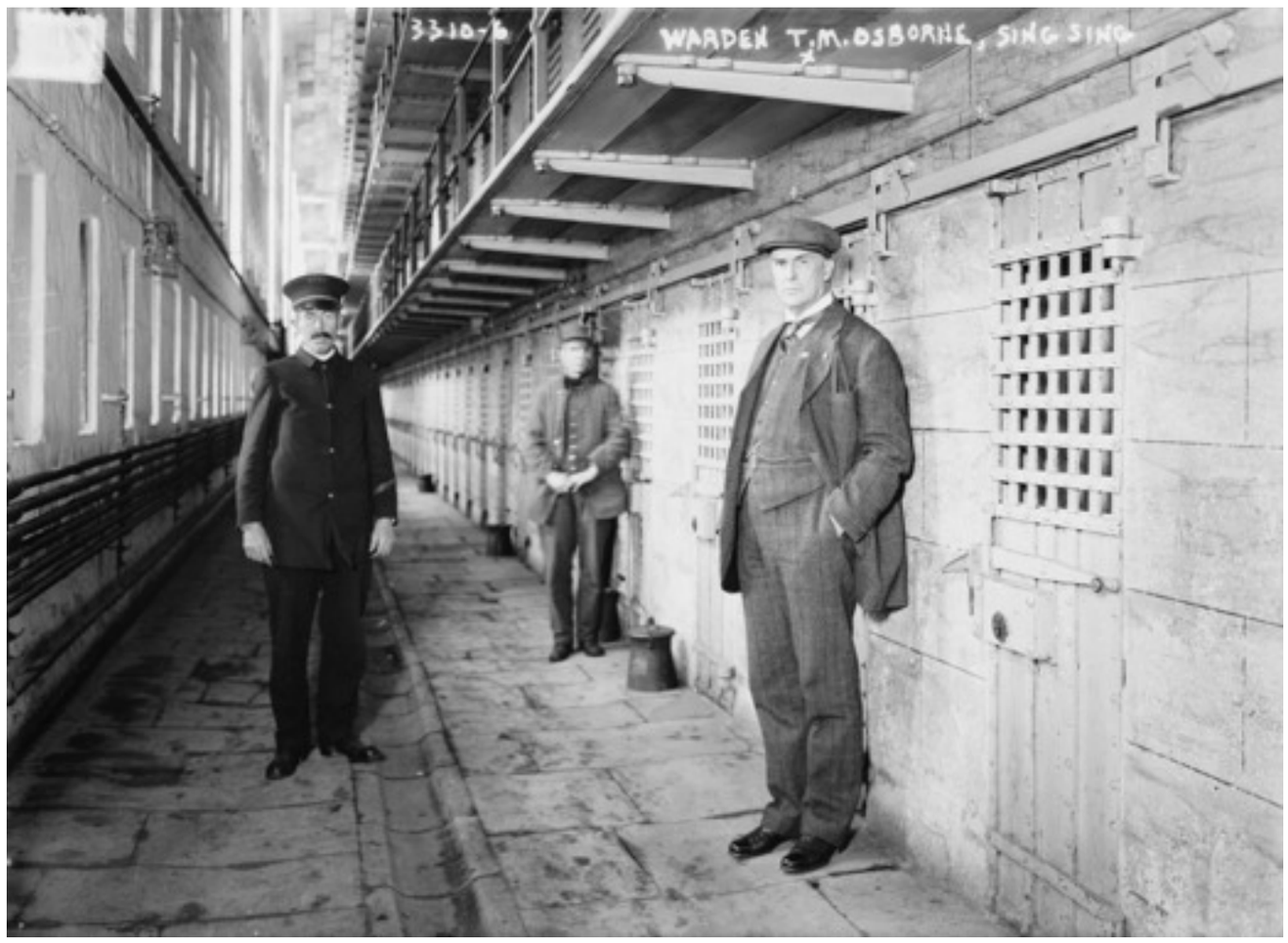

# Increasing the adjacent possible

Some technologies are softer than others - they open up new possibilities and can enable us to do many things in many ways. they enable creativity and can be used in many ways.

The stick is a soft technology, so is the computer (at least, if you are a programmer - not if you are using a computer as a shop assistant in a supermarket operating a sales till!)

Others are harder and deliberately limit the ways in which they can be used.
(side note: once we have uncovered new uses, we often wind up hardening them into new tools, which themselves may open up further adjacent possibilities)

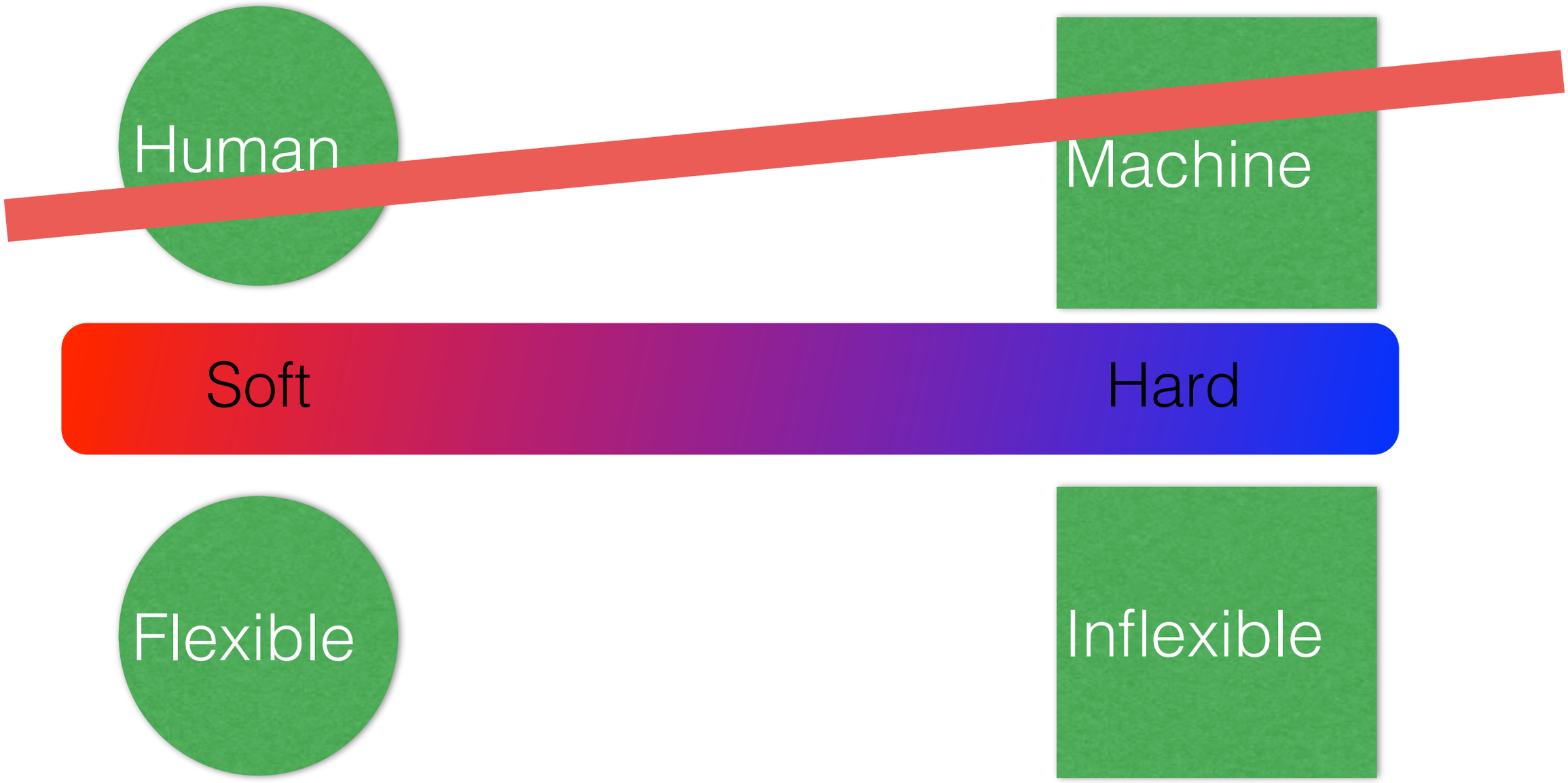
# Hardness




Makes things easier
By reducing choice

automation, embodying soft technological processes into fixes processes and tools, reduces choice, and therefore makes it easier to do whatever the technology has been designed to do (it also does many other good things like reducing cost, increasing speed, reducing error)
Automated production lines are hard technologies (including the whole technological assembly, not just the machines - the processes and methods of the production line are what contribute to making it harder). A checkout till is a hard technology. Rules that cannot be broken are harder than rules of thumb. The strict rites and rituals surrounding prayer in many formal religions are a lot harder than, say, a camera. An online shop is harder than a wiki.

# Two views of soft and hard technology




Soft as in malleable vs soft as in non mechanized.
Hard as in inflexible vs hard as in solid.

Soft technologies might be seen as more analogue - they allow for a wide range of potential uses and applications without fixed boundaries.
Hard technologies, on the other hand, might be seen as more digital inasmuch as, at the extremes, they are one thing and precisely one thing, or not at all. A mass-production factory production line, for example, might be considered very hard as it prescribes one and only one way of producing something, Knitting needles are very soft, because they can be used to knit almost anything (as well as other things like stirring paint, poking holes or scratching your back)

Hard is

easy

Hard technologies are designed to make things easier, faster, more efficient, less prone to error, often cheaper. But they do so at the cost of creativity and flexibility.

# Soft is

# hard

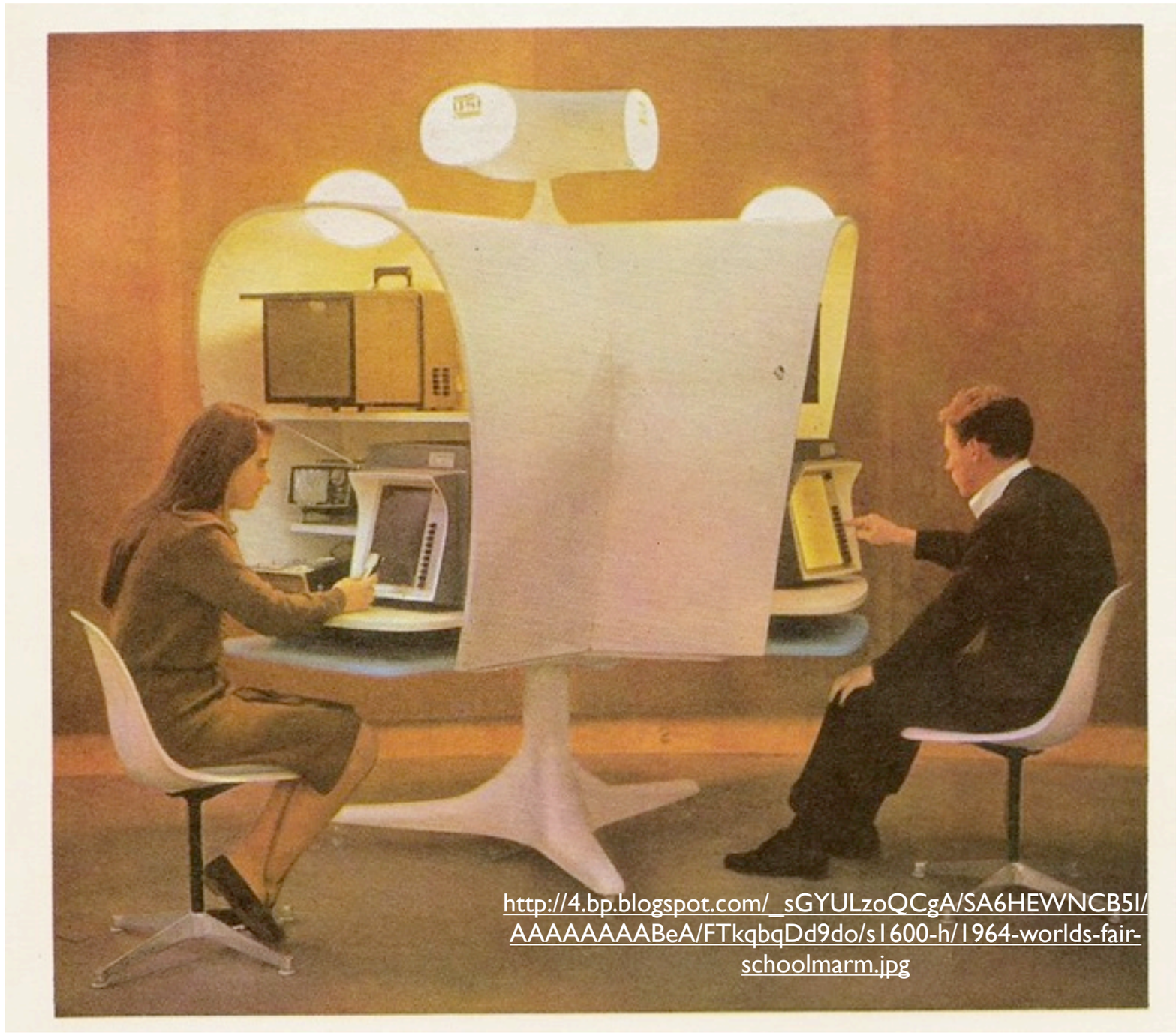
Softer technologies are difficult. The softer the technology, the more difficult it is for humans to employ, as a general (but not unbreakable) rule.

Softer technologies increase the adjacent possible by enabling and/or making more likely new choices to be made.

More choices come at a price - we have to make them. That is one thing that makes them more difficult or hard.

There is no simple rule that technologies should be soft or hard - it depends upon the context. What does matter is if a technolog
is too hard when less constraint is needed, or too soft when greater efficiency or reliability is needed.

# Soft for whom?



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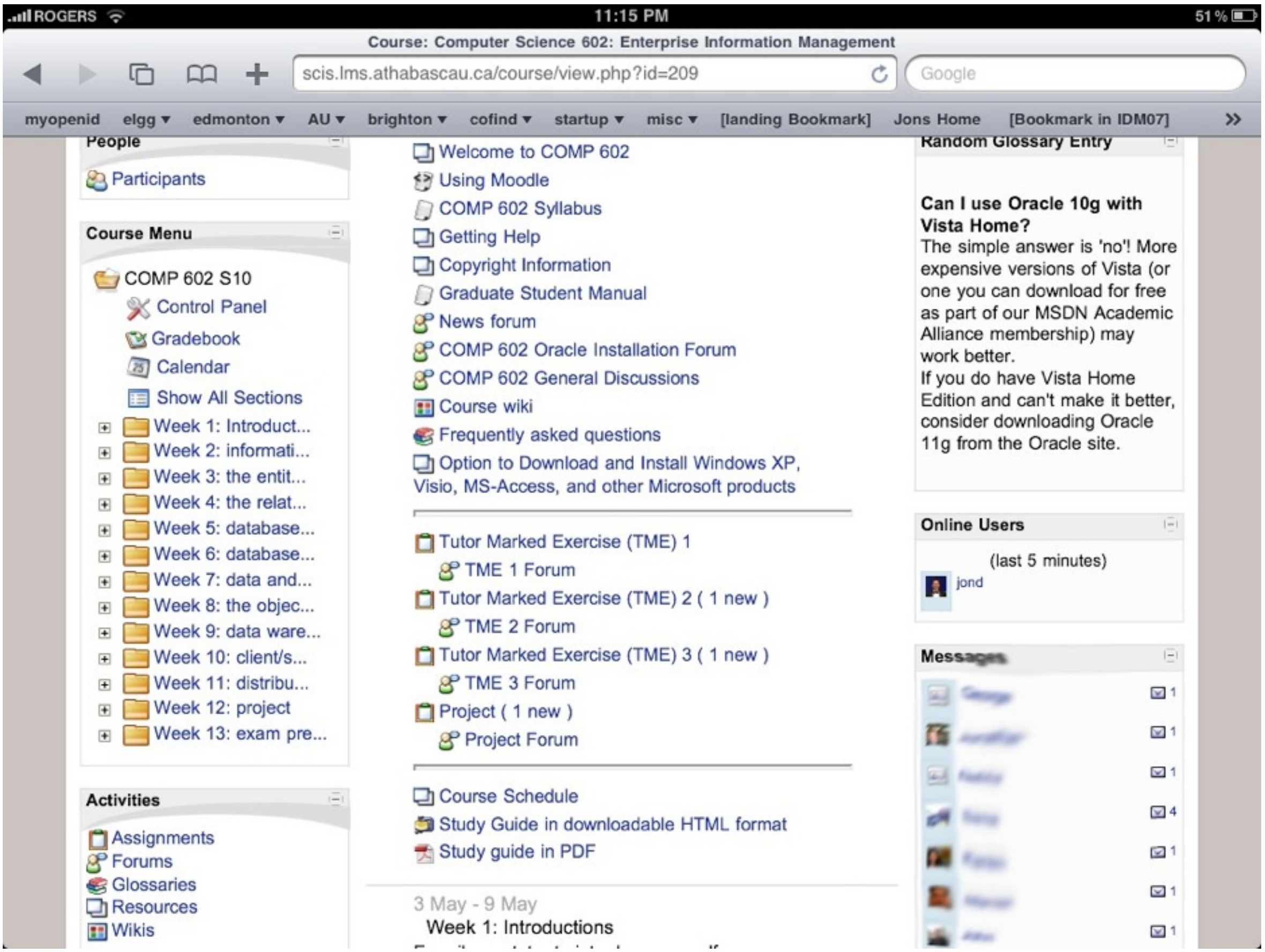
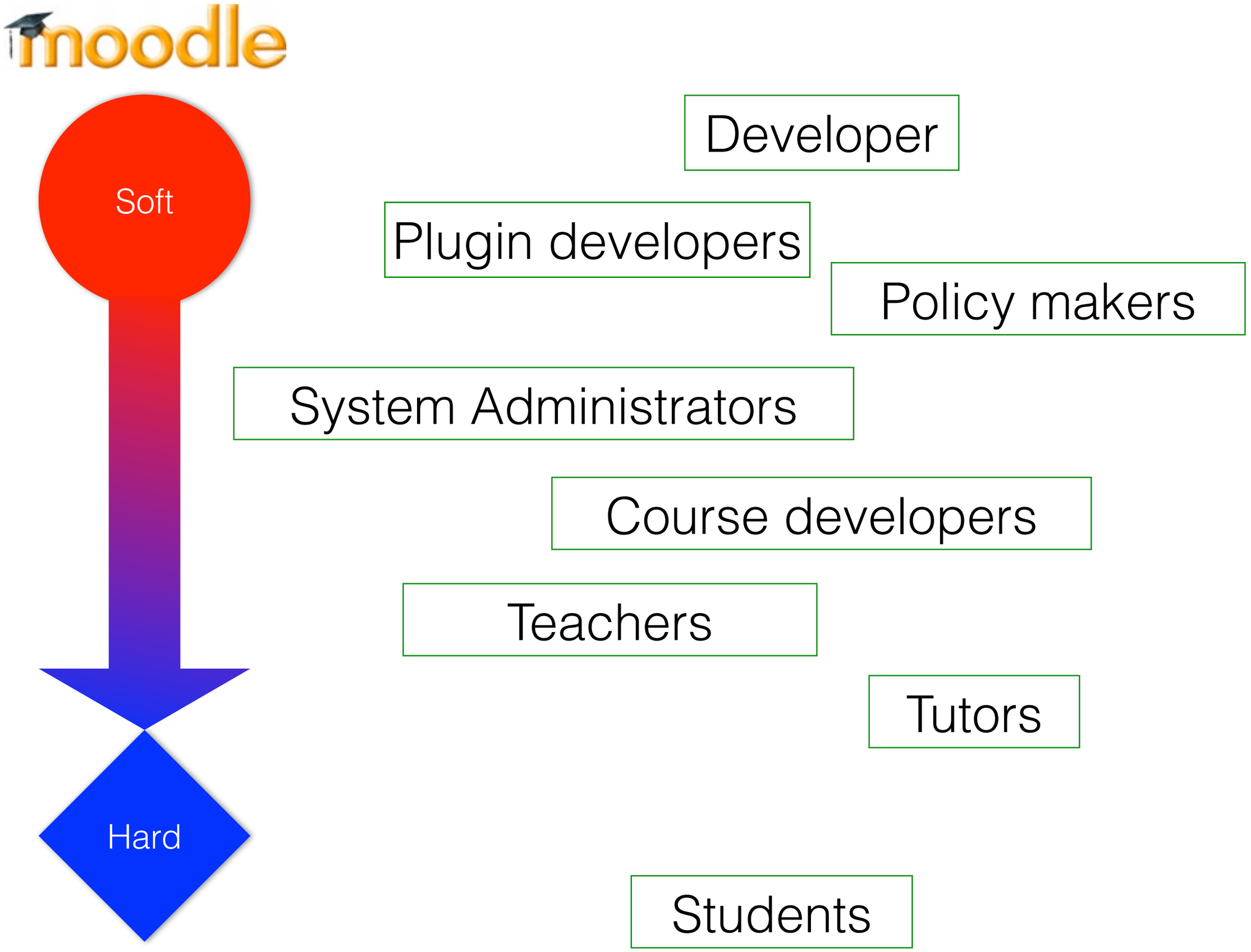
A technology that is soft for one person may be a set of chains for another. Computers are the softest machines ever invented, perhaps (language may be a contender), but only for those who use them to create other machines or who use the machines they embody to gain flexibility. For a clerk in a store operating a cash register, the opposite may be true: 'the computer says no' is the punchline of a great series of sketches on British TV but is a ubiquitous feature of life - most of us are victims most days of a machine limiting what someone can do to help us.




An example - a learning management system. For some people this is a hard technology, strongly persuading them to follow a particular path, limiting choices. For others, it is a liberating and soft technology that enables a range of adjacent possibilities that were not there before. But for who is it hard and for who is it soft?



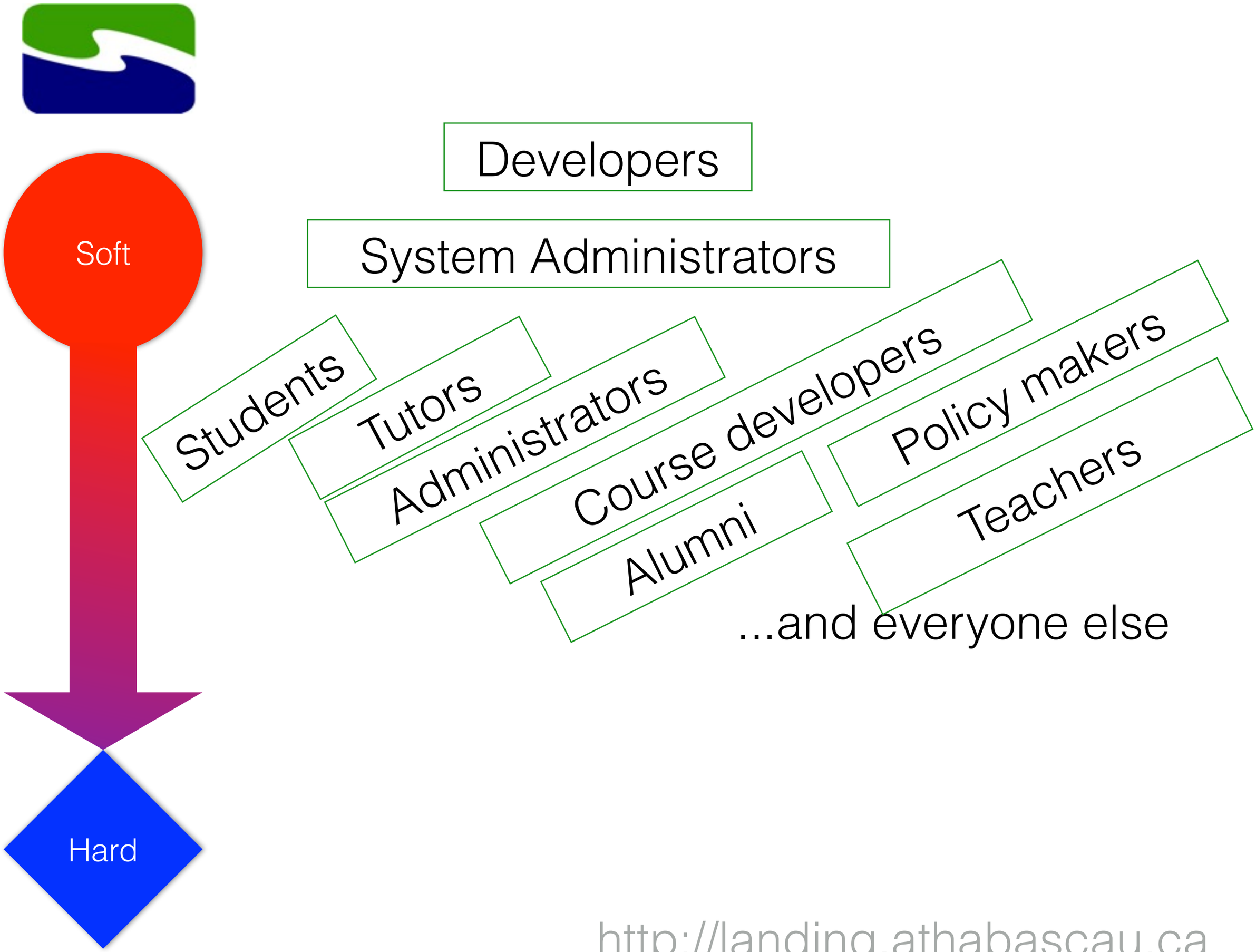

A learning management system is very soft for its developer - it can become anything. For the system administrator it is harder, but still offers great flexibility. As we move down the line towards the student, the technology becomes more and more inflexible, rigid and fixed, determining what can be done.


https://landing.athabascau.ca

By way of an example, the Landing at Athabasca University, software based on Elgg social networking framework. Currently 1800-1900 users, all of whom have equal rights to create, share, communicate. This is also a soft technology for developers etc but it is also softer for others...


the Landing is primarily about connecting, sharing and communicating, with a central belief that users should own the system, not administrators

The trouble with this approach in most systems is that it is, by definition, a soft technology. This makes automation difficult. A constant struggle between need for top down control and bottom up control. We are trying to make that more adaptable - the next few slides are about this




Social technologies are inherently soft - still harder for end users than for developers, but they are designed in a manner that lets soft technologies develop and form with fewer constraints. It does this through a combination of inherent softness - wikis, blogs, messaging, forums, etc may be used for an infinite variety of purposes over which non-physical technologies can be overlaid, such as norms, rules, guidelines, laws and processes that people follow. It is also softer because it enables end users to create and assemble the tools in different ways. This gives a clue about how systems develop and the kinds of skills that are needed in the age that follows automation (tools that informate, not tools that automate)
The problem is - soft is more difficult. How do we design systems that can be soft when needed and hard when not?

# Making soft things harder and hard things softer

What we need to be able to do is to make things hard when we want life to be simpler for end users, but make them soft again when we wish for innovation. Luckily, this is precisely the trend that we are seeing. If we are to be successful in enabling people to deal with new technologies as they arise, we need to give them the means to understand how these changes happen and to participate in those changes.


# Modification vs aggregation

There are really only two ways to soften a hard technology. We can modify the tools so that they are more flexible. Or we can take a lot of small hard tools and aggregate them together.

Making modifiable tools is difficult because it presents two many choices, too many things to learn. Aggregating things is simpler because we can work at a larger scale. That is, incidentally, the pattern in how computers have developed from pressing switches, to binary coding, to punch cards, to assembler, 3GLs, object oriented and 4GL systems and so on.

Aggregation can soften: adding or replacing a functional element with another extends what a system can do and how it does it.

Aggregation can harden: can add a more rigidly defined toolset to reduce ambiguity or limit options

# Aggregation approaches

- Objects
- Plugins
- Widgets
- Apps

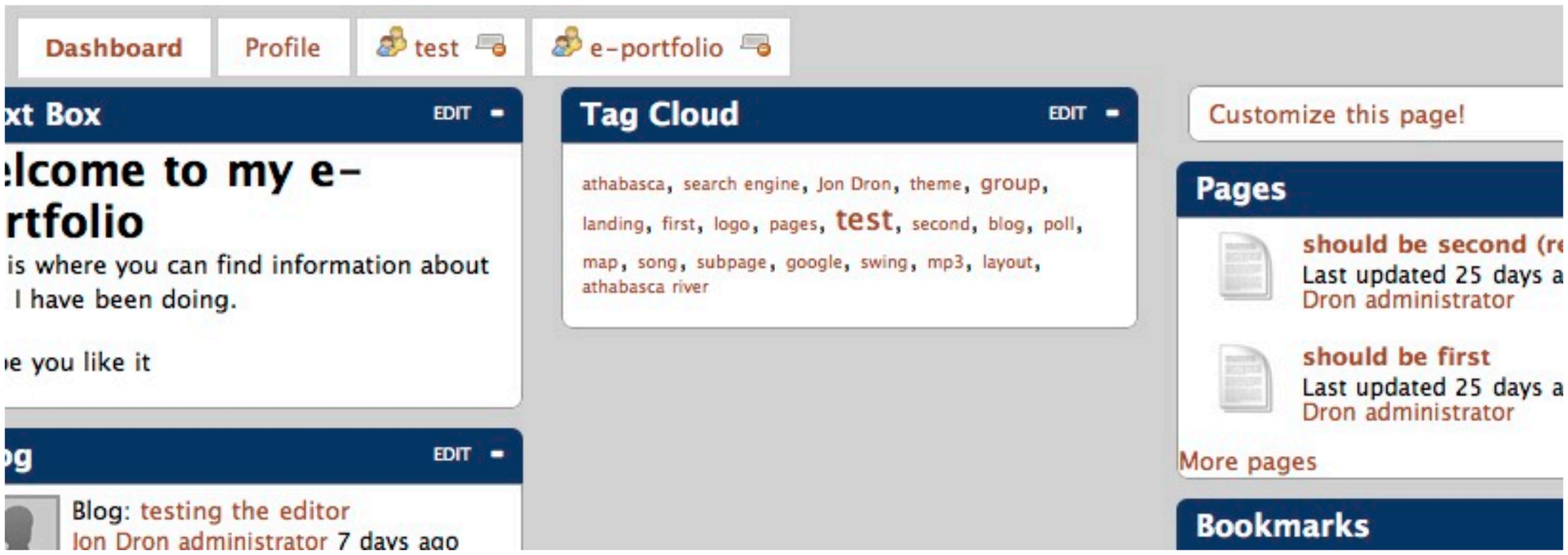

Objects make life easier for programmers and designers but are not much use to people who do not want to program or do not have time to learn

Plugins are good news for site administrators as they can build systems out of them that are highly customised but, again, not much use to most end users.

Widgets are a great idea- a W3C widget standard, implemented by Google, Windows, Apple, Nokia, and very many more in very similar (if not identical) ways. Can be used standalone or dragged into a system such as Elgg, Moodle or Drupal (through Wookie) or Netvibes or Ning.

Apps are how modern phones and tablets can be customised: simple tools that do little - if you need more, you get a new app for it. Some are, of course, widgets!

# Some things we are doing




- Highly configurable widgets
- Tabbed profiles - different faces for different uses and different audiences
- Differentiated 'friends'

All of this adds up to tools that can be used to create soft or hard technologies as and how people see fit to create them. Key issue is one of control: people can choose when to choose.

# Analogue literacy

- The dance of technology
- a co-evolution in which we adapt to machines and they adapt to us
- Digital literacy is a temporary and diminishing issue from the time that ‘digital’ meant ‘desktop computer’
- Issues of accelerating change and the effects of the adjacent possible mean the literacies we need are soft, analogue literacies
- Solutions concern connecting and finding new knowledge
- The big remaining problem: access

TEKRI

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Technology Enhanced Knowledge
Research Institute

# thank you
# どうもありがとう

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