



The Role of Incremental and Transformative Change in Future Prediction

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Campus Technology
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<http://www.downes.ca/presentation/392>

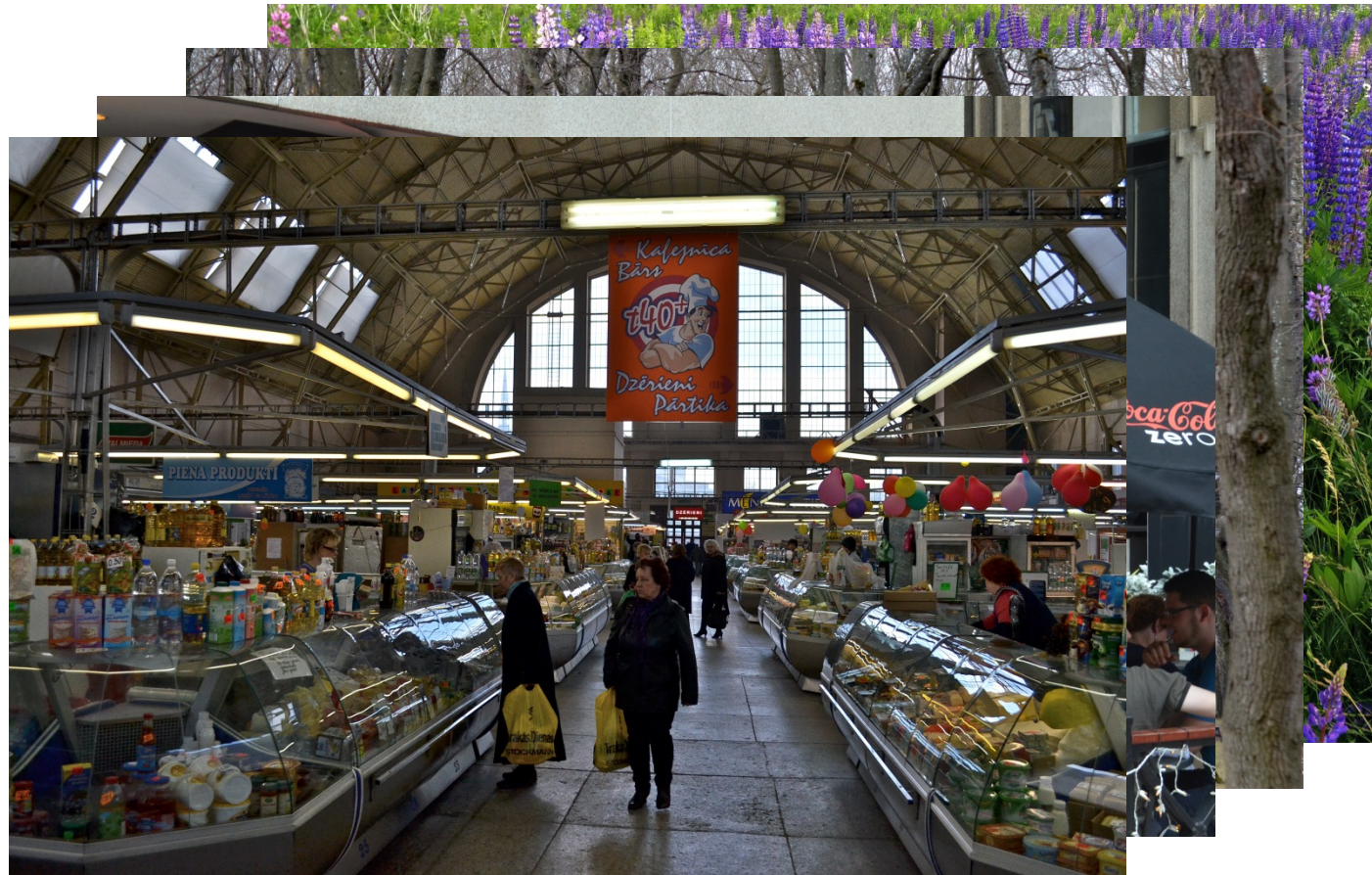
1. The Future



Kakadu, Australia, 2004

Nobody Can Predict the Future?

Let's make some predictions together...



Riga, Latvia, 2014

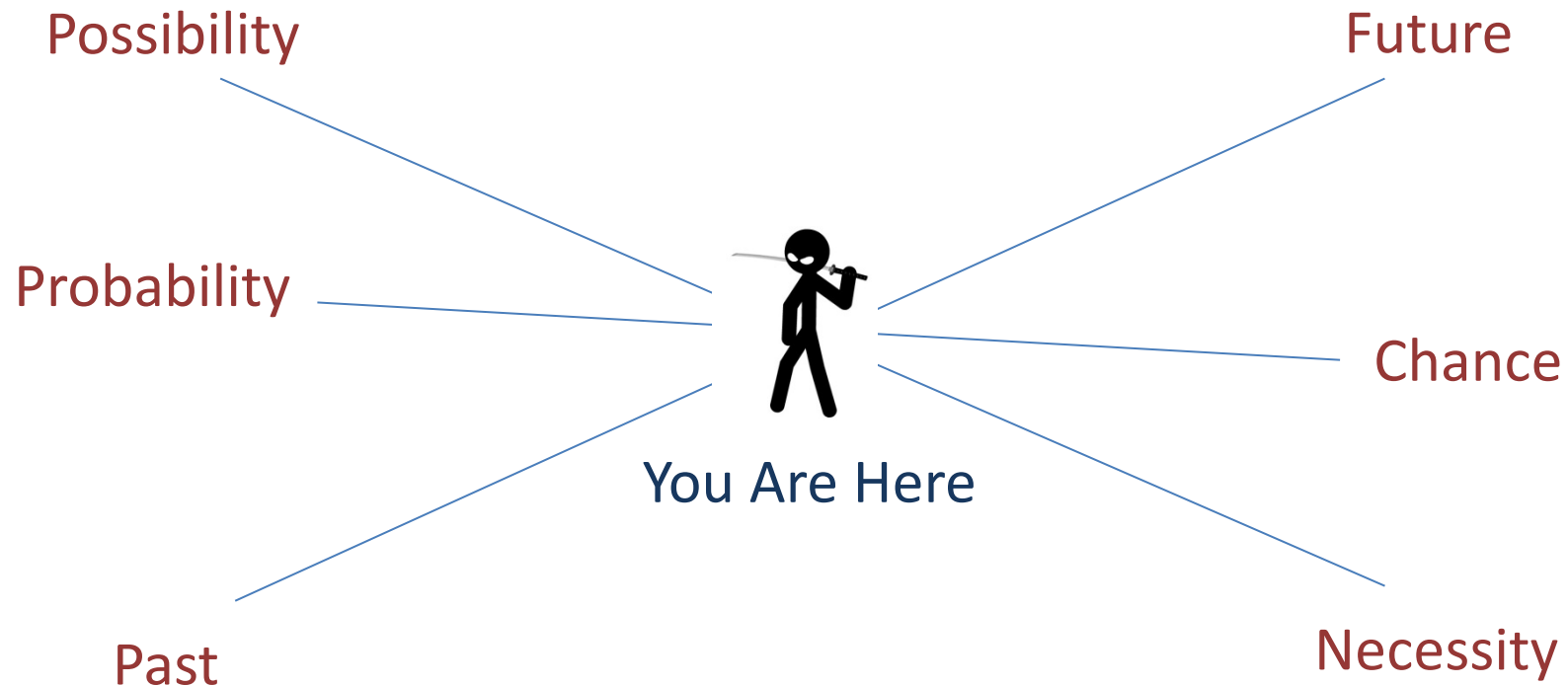
We Predict by Reading the Signs

- Prediction isn't magic, it's a form of reasoning
- Overall, it is an instance of *recognition*

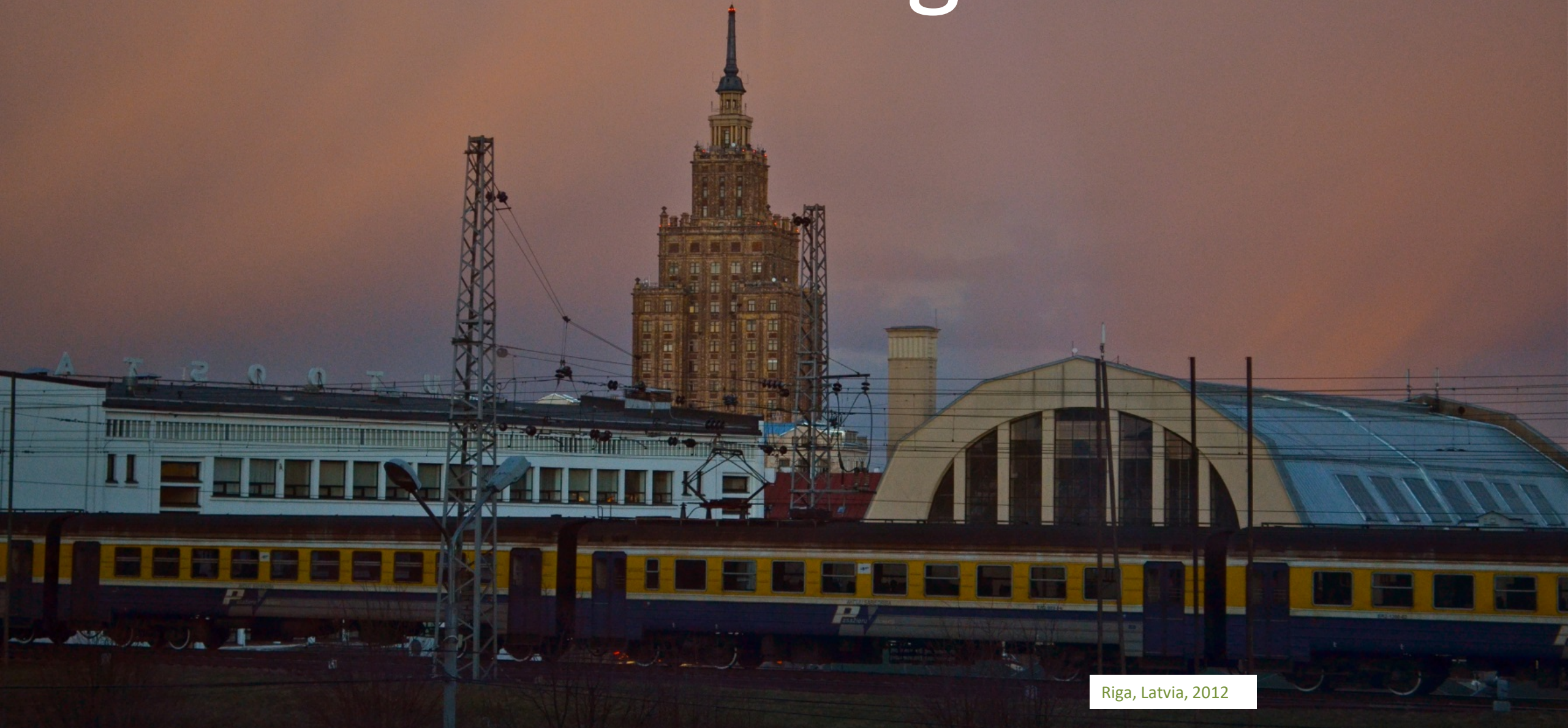


The Future and the Past

The future and the past are epistemologically equivalent (so are possibility and necessity)



2. Change

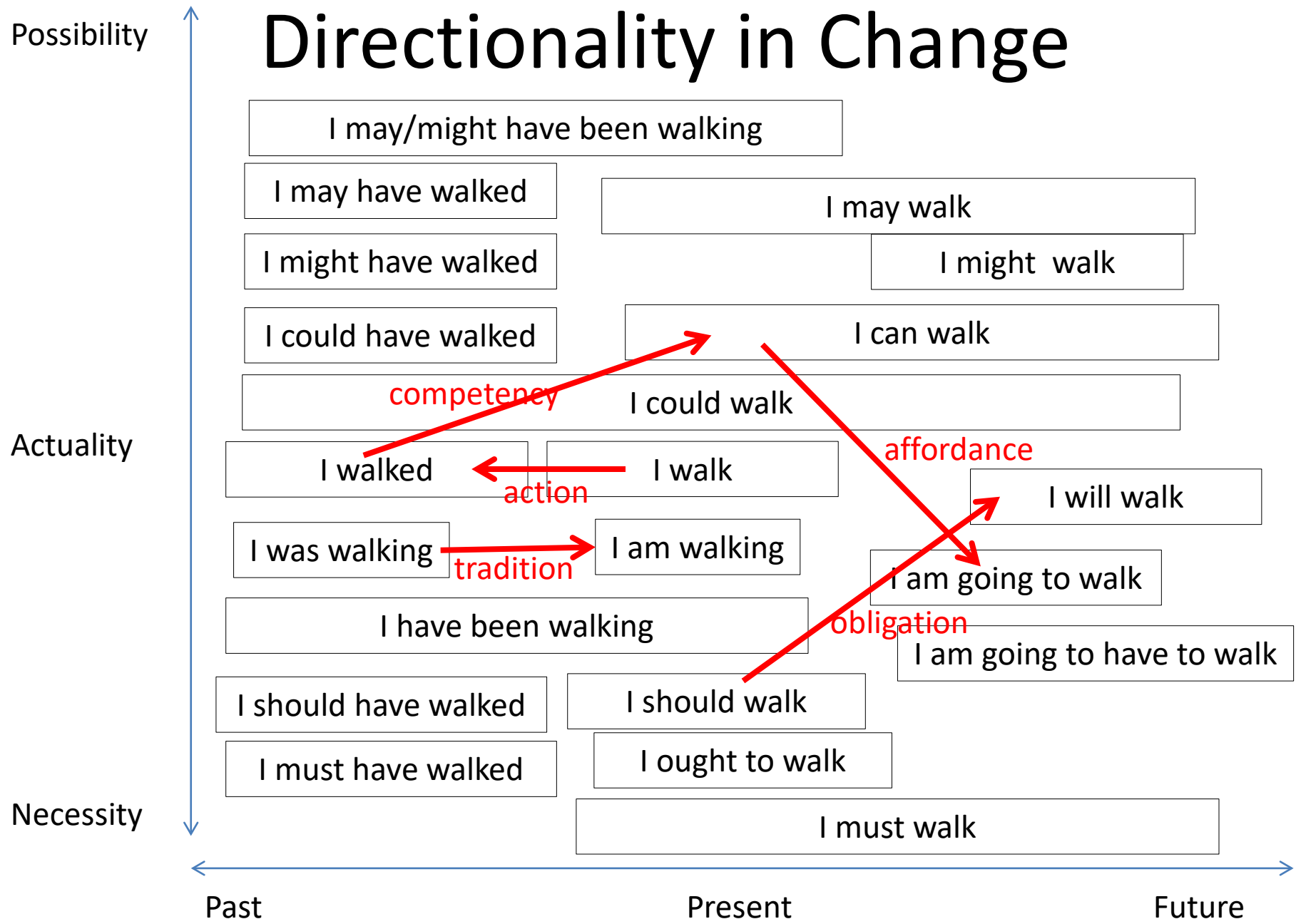


Riga, Latvia, 2012

Seeing Change

- Nothing changes
- Everything changes
- Change = change to edge conditions
 - What counts as change depends on how you see the world
 - What you see (often) depends on what you're looking for
 - What you're looking for (often) depends on what you (currently) value

Directionality in Change

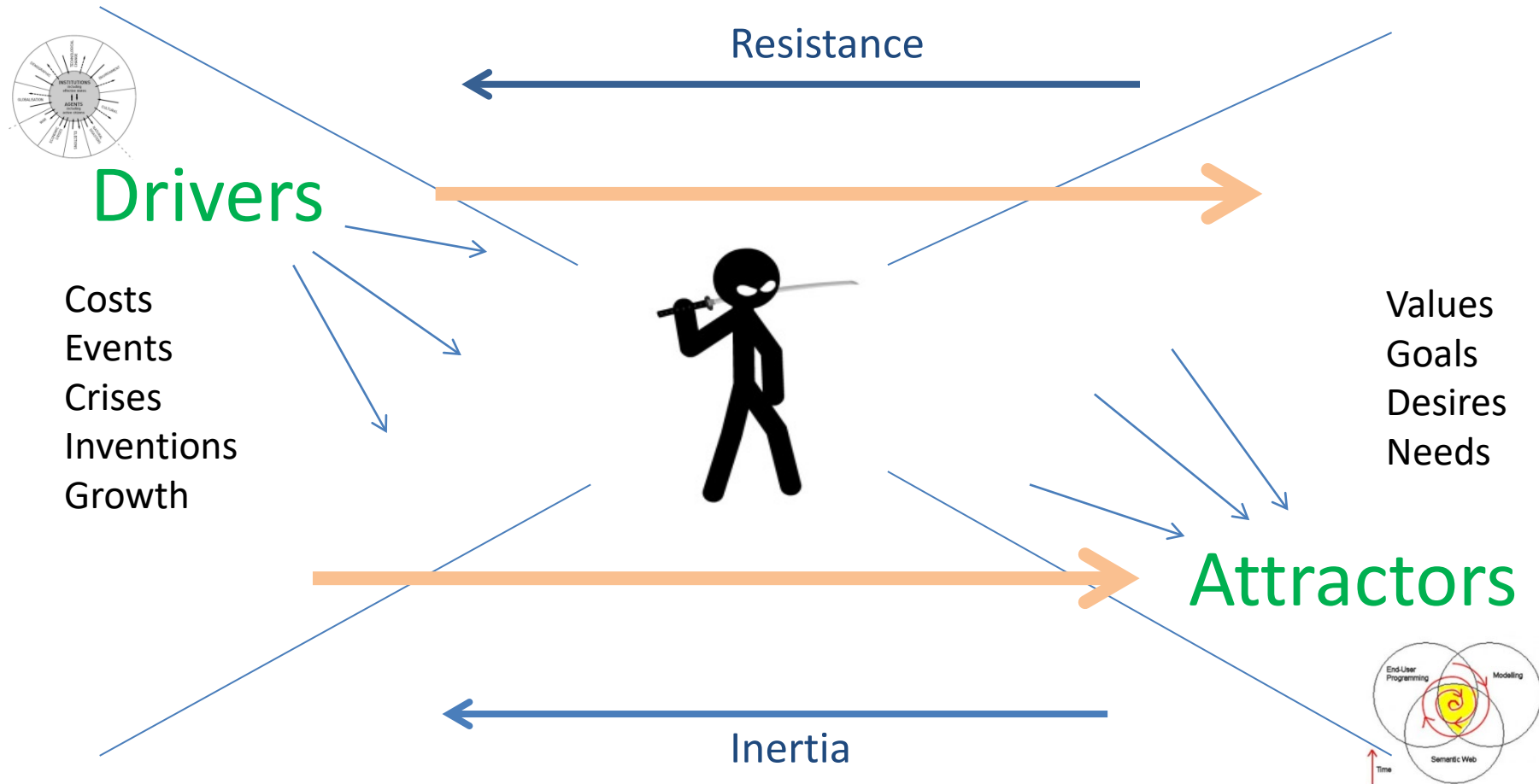


Patterns of Change



Dialectic Cycles

Causes of Change



Change in Education

- Many Changes in tech that changed learning were the result of *drivers*
 - Writing and publishing – print technology
 - Public education – social forces
 - Networks – electronic technology
- They came from *outside* education
 - They impacted how we manage and deliver education
 - But they also reflected changes in what we *value* in education

Education Disruption

- Everybody wants to ‘disrupt education’ without having the sense that this means ‘keep it the same, but with more benefits for me’



- John Battelle. 2016. Want a Deep Dive on How Silicon Valley's Best Will Fix Education? Here's The Full Interview With Max Ventilla, CEO and Founder, AltSchool. <https://www.linkedin.com/pulse/want-deep-dive-how-silicon-valleys-best-fix-education-john-battelle>
- Ilan Mochari. 2015. Inc. 16 Startups Poised to Disrupt the Education Market <http://www.inc.com/ilan-mochari/16-startups-that-will-disrupt-the-education-market.html>
- Image: Larry Downes and Paul F. Nunes. 2013. Dig Bang Disruption. Harvard Business Review. c/o Accenture. https://www.accenture.com/t20150521T020819_w_us-en_acnmedia/Accenture/Conversion-Assets/Blogs/Documents/1/Accenture-Big-Bang-Disruption.pdf

Change or Innovation?

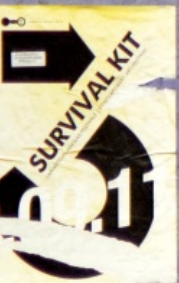
- What do we want to see in education: change, or innovation?
 - That depends very much on whether you're winning or losing



Malealea, Lesotho, 2006

- Rob Abel. 2013. What is Disruptive Innovation in Education? <https://www.imsglobal.org/article/what-disruptive-innovation-education>

3. Innovation



Riga, Latvia, 2012

What is Innovation?

- Idea + Execution + Benefit
 - innovation is defined “as change that creates a new dimension of performance” - Peter Drucker
<http://en.wikipedia.org/wiki/Innovation>
 - “Innovation is then simply new technology, i.e. the systematic application of (new) knowledge to (new) resources to produce (new) goods or (new) services” - Maciej Soltynski at Innovation.cc

- <https://www.ideatovalue.com/inno/nickskillicorn/2016/03/innovation-15-experts-share-innovation-definition/>
- <http://www.freshconsulting.com/what-is-innovation/>

The Idea

- **Product** innovation – a new type of product or service
- **Process** innovation – change in the production function, eg. change in input mix
- **Organizational** innovation – change in managerial procedures
- **Market** innovation – eg. developing a new market for an existing product
- **Input** innovation – new raw material, new energy source, etc

The Benefit (Sustaining)

Different ways of talking about direction

- Better **quality** of experience
 - - eg. 4K – bigger pictures
 - ‘student success’
- Lower **cost**
- Increased **efficiency** and productivity
 - Typically, ‘standards’
- **Solutions** to problems
 - Access, engagement, completion

The Benefit (Disruptive)

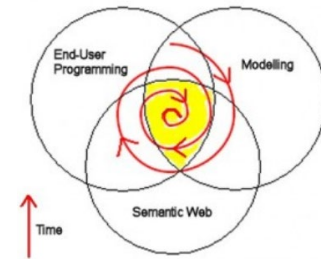
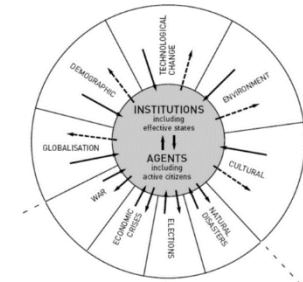
- Incumbents target high end customers
- Disruptors target with **product & price advantage**:
 - low-end footholds
 - new market footholds
- Not just product innovations;
- Can be business model, etc.



Tbilisi, Georgia, 2014

Innovation as an Attractor

- We think of change an innovation as working in the same direction, but typically they are working in opposite directions:
 - **Drivers**: out from the centre, toward uncertainty and chaos
 - **Attractors**: toward the centre, toward order
 - And especially preserving what was
 - Sometimes: adaptation to change



Innovation in Education



Mexico City, Mexico, 2016

- Is education “ripe for disruption”?
- Changes in tech that didn’t change learning
 - TV, Video, overhead projectors
 - Portable classrooms
 - Learning management system
 - Clickers?
 - Second Life

Innovations but not
disruptions

A Candidate for Disruption?

- Online Learning (1995f) & The MOOC (2008f)
 - “Stalled efforts to push MOOCs through the institutional membrane that surrounds higher-education credentialing have cast doubt on whether large-scale free courses will end up disrupting anything.” Steve Kolowich
 - “The reality of online learning... a substantial increase even in years of financial pressures on enrollments.”

What Counts as Innovation?

- It depends on how the world sees you
 - Is there ‘**demand**’ for the new thing (eg., a market, buyers, users)
 - Is there a ‘**business** case’ for it? (Cost/value model)
 - Is there a ‘**benefit**’ for the customer (greater income, lower cost, amusement)?
- What happens when these change?

4. Transformation



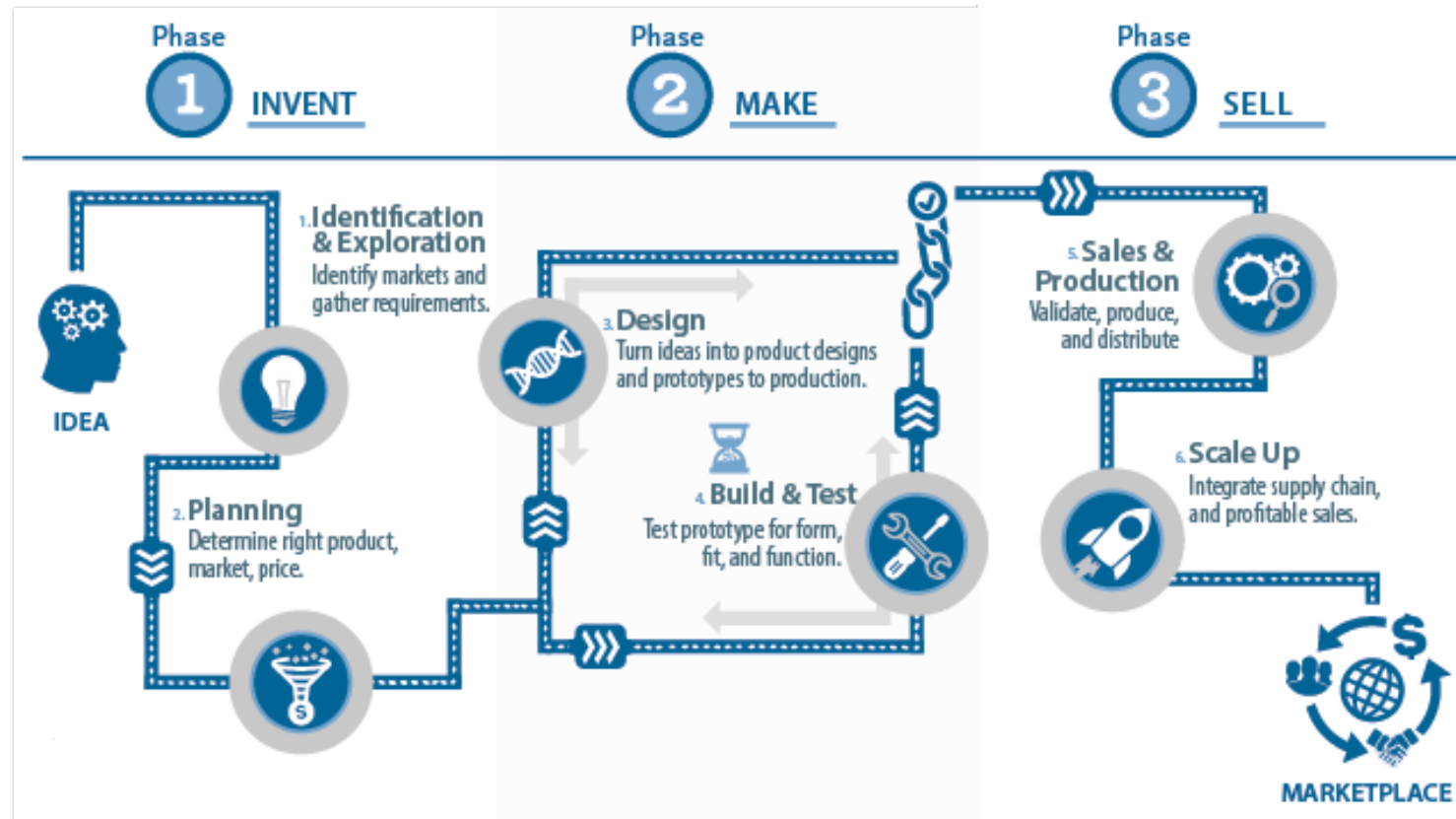
What are Research & Development?



Riyadh, Saudi Arabia, 2015

Science as a "combination of evaluating evidence, coordinating evidence and models, and arriving at evidence-based judgments that are communicated through argumentation."

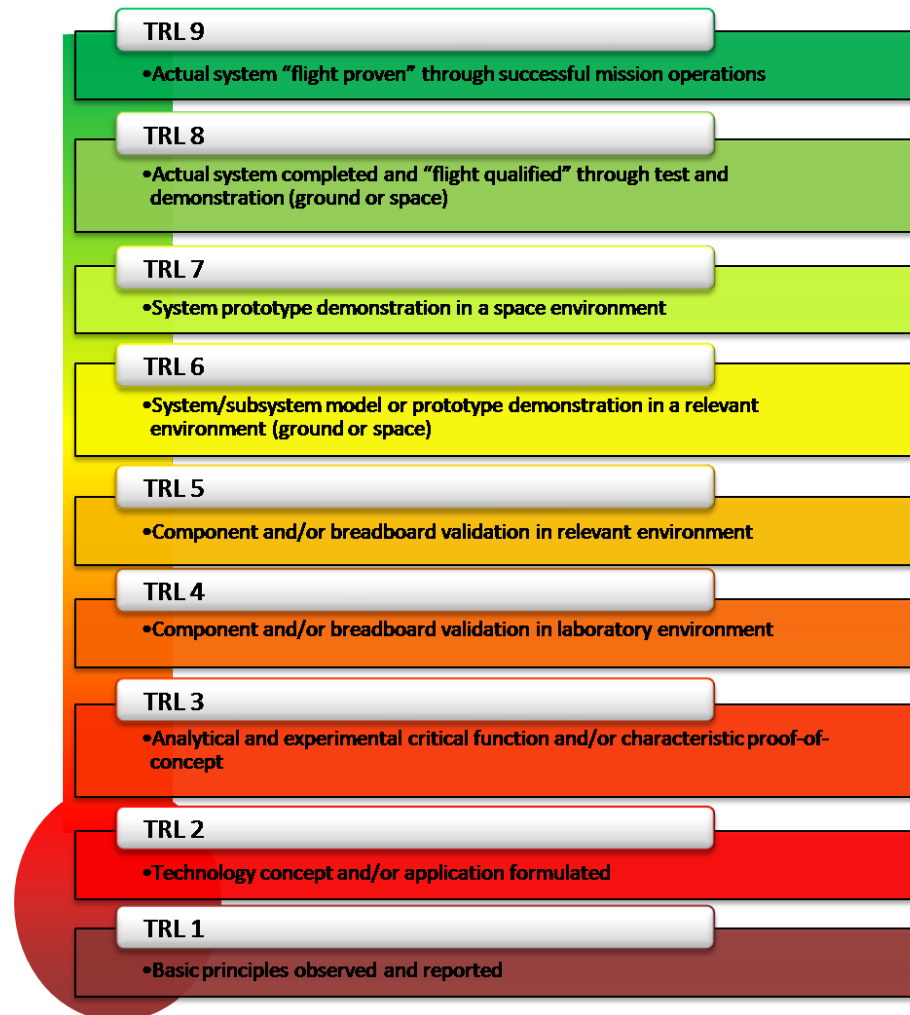
Stages of Innovation



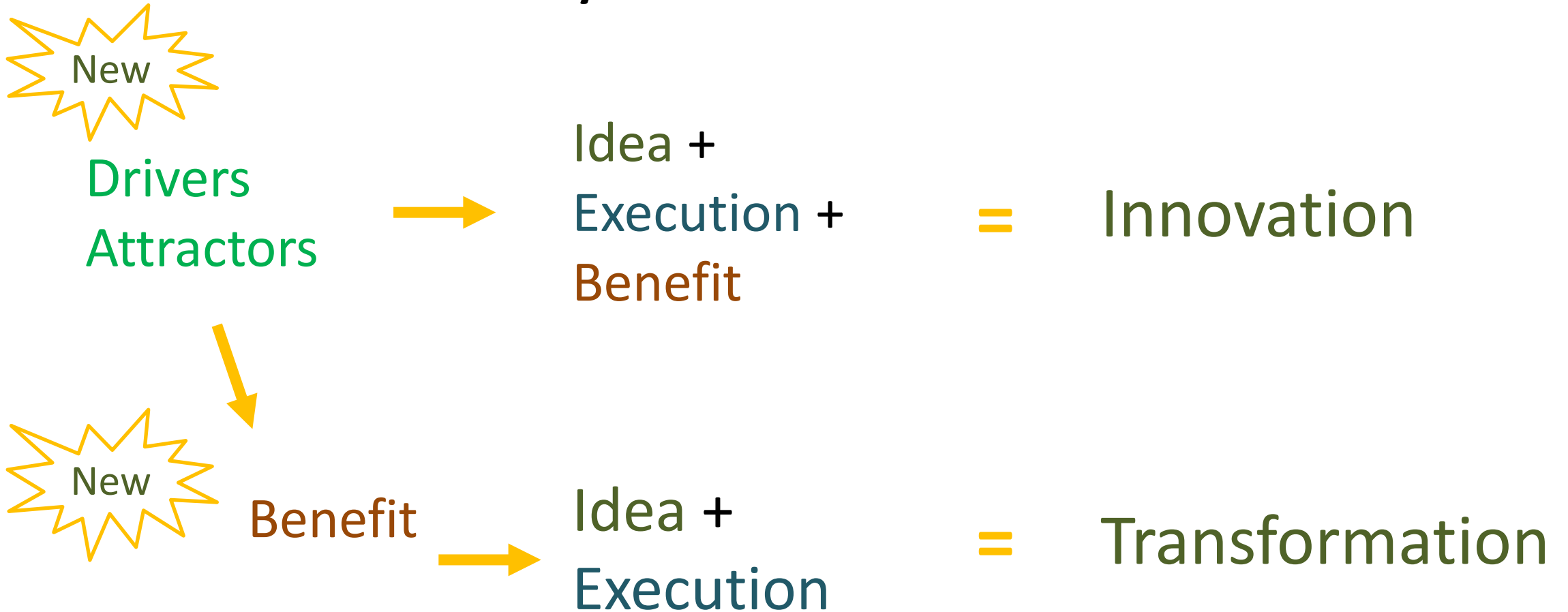
Does selling really come after making?

Technology Readiness Levels

From concept to
prototype to
qualification to
proof...



Beyond Innovation



What is Transformation?

- “In an organizational context, a process of profound and radical change that orients an organization in a **new direction** and takes it to an entirely **different level** of effectiveness.”
- “Transformation implies a **basic change of character** and little or no resemblance with the past configuration or structure.”

• Read more: <http://www.businessdictionary.com/definition/transformation.html>

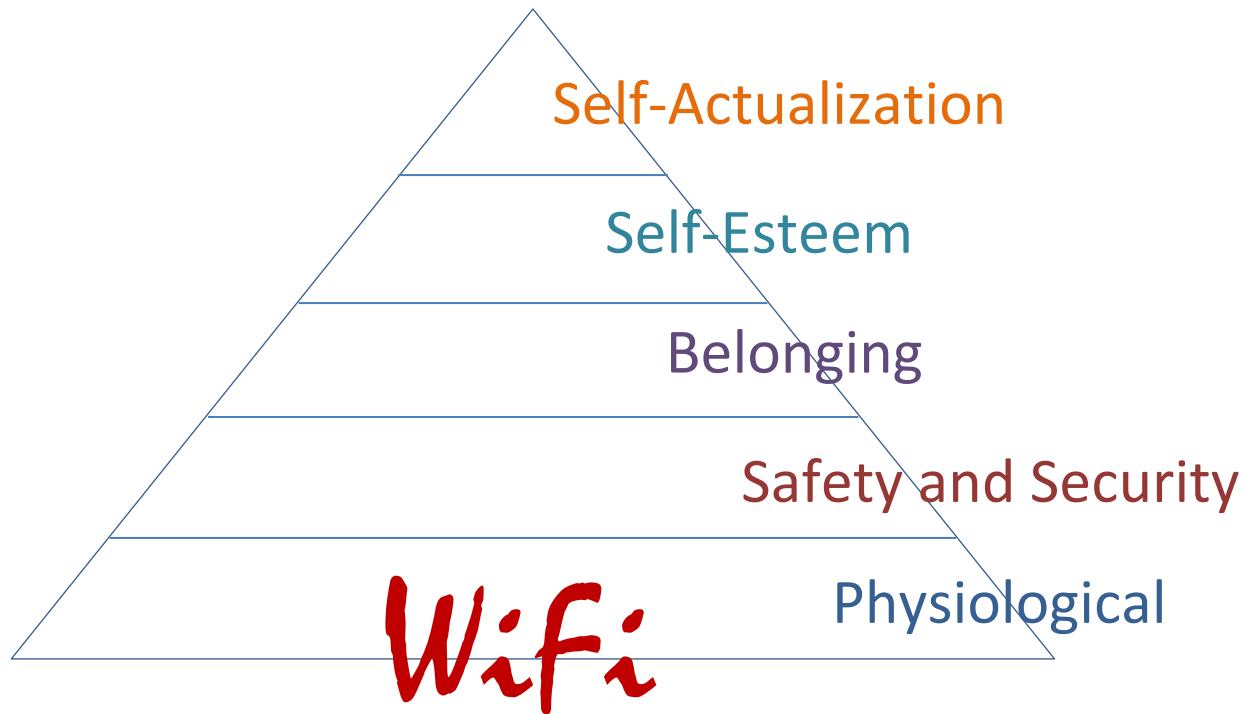
Microsoft's Vision

- Learning community
- Teacher capacity
- Efficient schools
- Personalization
- Physical learning environments
- Curriculum & assessment
- Is this really transformation?
- Are these things we really want?



Questions to Ask

- What will new technology enable?
- How will our wants and needs change?



Does Maslow
speak for us?

Transformation of Education

- *Now* we're asking the right kind of question
- Look at how education has been transformed through the years based on changing definitions of need:
 - past needs: storytelling
 - present needs: 'apprenticeship' (aka child labour)
 - future needs: preparing for the factory
 - potential needs: the route to academia

Who Speaks for Us?

- Who defines innovation?
- Who defines student success?



George Couros. 2016. Who is Defining Student Success? <http://connectedprincipals.com/archives/12581>

Curitiba, Brazil, 2015

5. Execution



Panama Canal, Panama, 2012

Reframing the Issues in Education

- Students must pay too much to study and learn
- Assessment is unreliable and (often) unfair
- Texts and resources are locked behind paywalls
- Content is poorly communicated
- Life as a student is incredibly stressful
- Research studies are poorly designed.
- Education science rarely replicates

- <http://www.vox.com/2016/7/14/12016710/science-challenges-research-funding-peer-review-process>

New Models of Deployment

Conventional Wisdom

Focus on one innovation
(low cost, product, customer)

Target small group first, then mainstream

Low cost feature-poor technologies

Strategic Discipline

New-Product Marketing

Innovation Method

Big Bang Wisdom

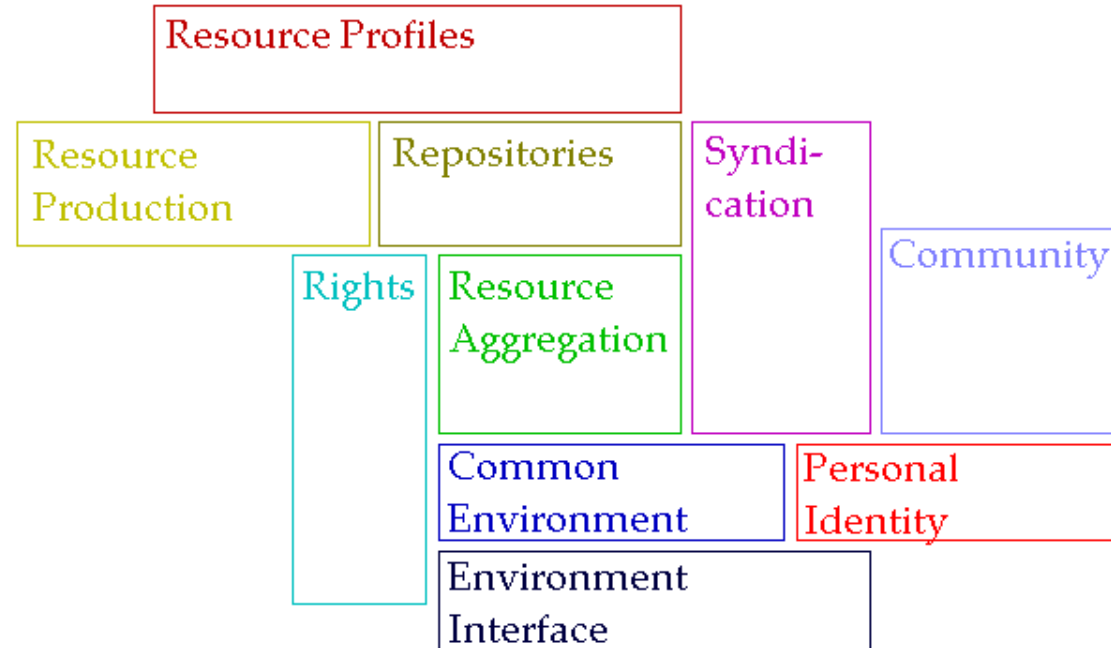
Focus on all three at once

Market to all at once, scale swiftly

Experimentation on popular platforms

- Adapted from Larry Downes and Paul F. Nunes. 2013. Dig Bang Disruption. Harvard Business Review. c/o Accenture.
https://www.accenture.com/t20150521T020819_w_us-en_acnmedia/Accenture/Conversion-Assets/Blogs/Documents/1/Accenture-Big-Bang-Disruption.pdf

The New Institutional Perspective



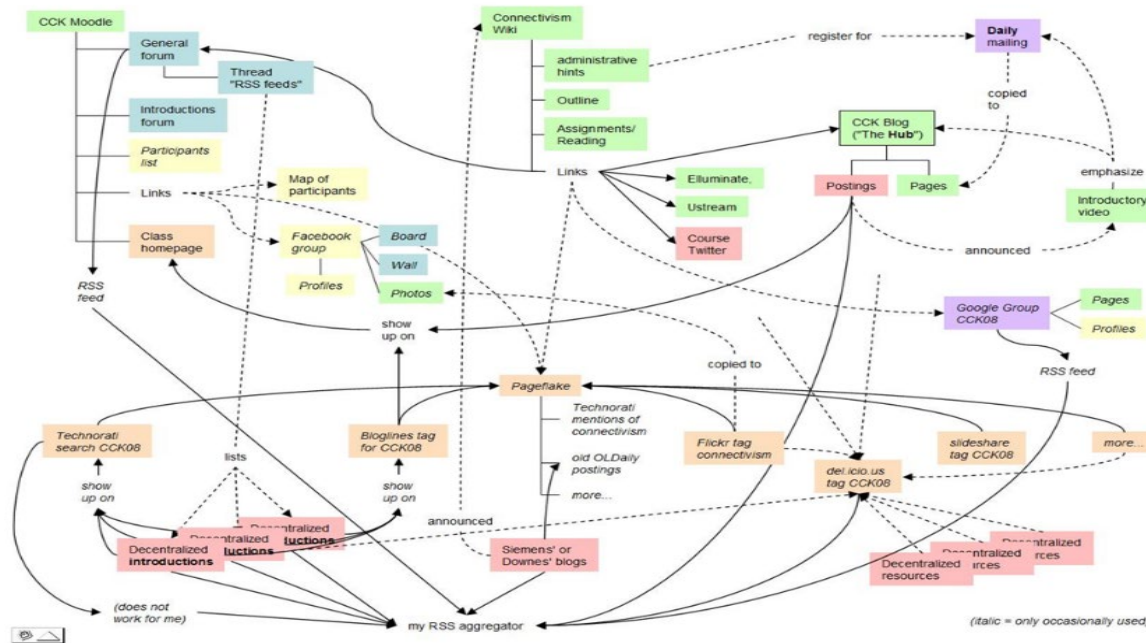
- Don't do things to people, do things with people, **help people** do things
- If we have to ask "how do we motivate people" then we're taking the wrong approach – Kohn; "**Knowledge sharing** is your job" – Buckman; Provide opportunities for **autonomy, mastery, purpose** – Pink

New learning Paradigms

Path	Field
Course	Curriculum (as in 'mapping')
Sequence / Prerequisite	Core / periphery / foundation
Movement / covered	Inquiry / Discovery / Gaps
Threshold / Levels	Coverage / Construction
Positioning – first / last	Grouping / Clustering
Objective / target	Serendipity / emergence
Leading / Led	Centred

Carrie Paechter, Metaphors of Space in Educational Theory and Practice
<http://www.tandfonline.com/doi/pdf/10.1080/14681360400200202>

The Connectivist MOOC (cMOOC) Design



A MOOC is a Web, not a Website

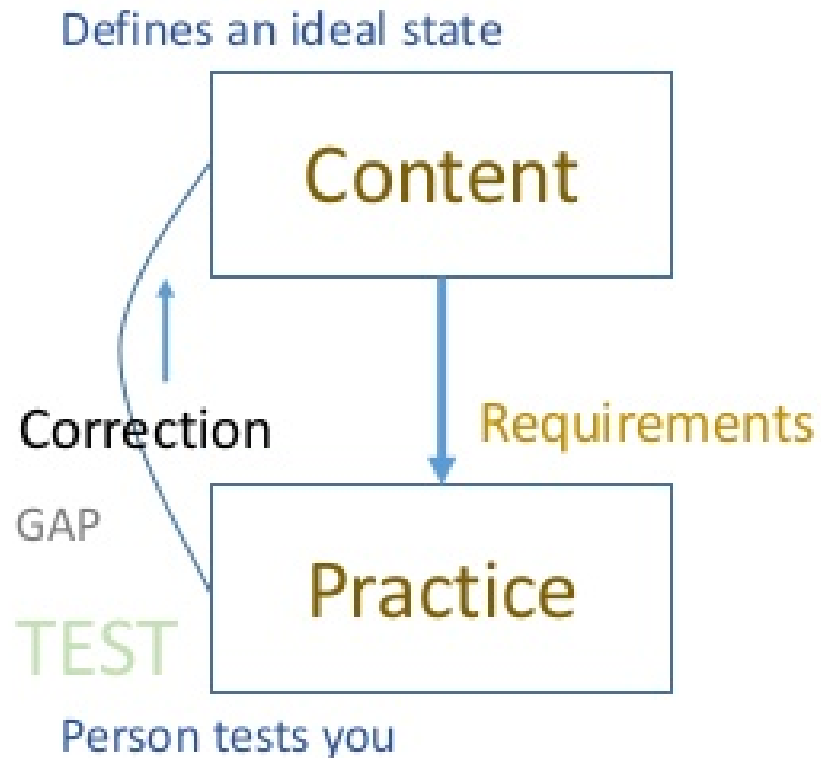


Instead of seeing a course as a series of contents to be presented, a course is a **network of participants** who find and exchange resources with each other

- An initial structure is developed and 'seeded' with existing **OERs**
- Participants **encouraged** to use their own sites to create or share resources
- A mechanism (gRSShopper) is employed to **connect them**

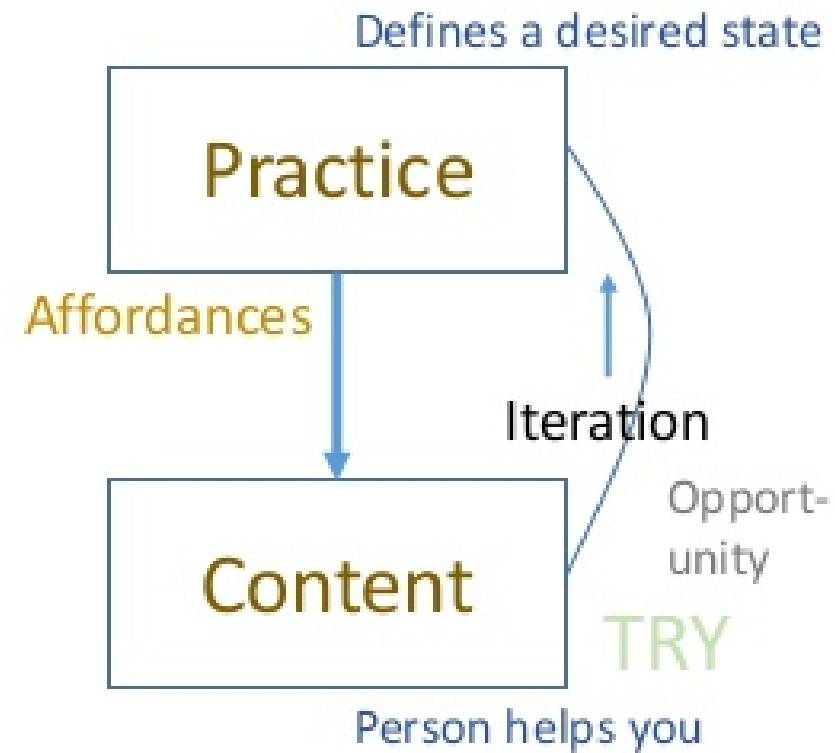
Personalized

We do for you



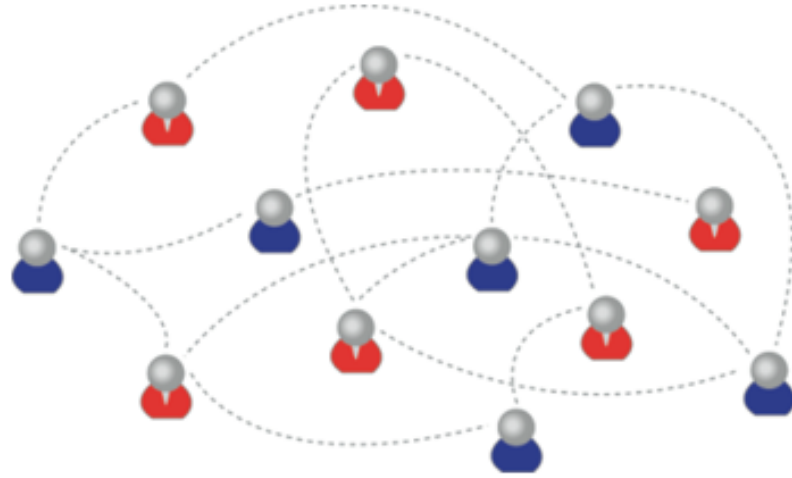
Personal

You do for yourself



Learning is Personal

Learning Outcomes



We are using one of these

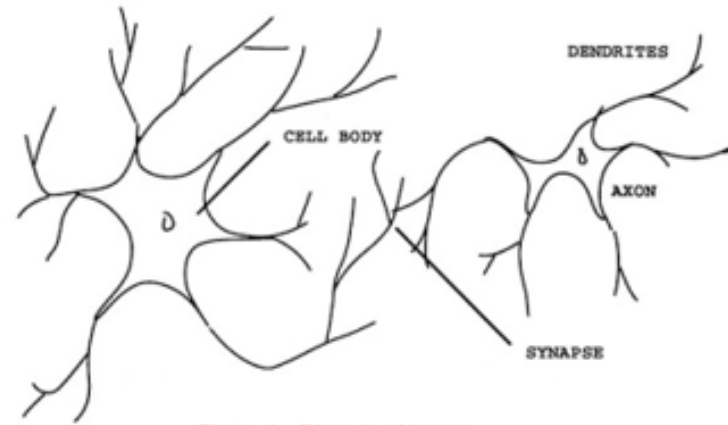


Figure 1. Biological Neuron

To create one of these

- Learning a discipline is a total state and not a collection of specific states
- It is obtained through immersion in an environment rather than acquisition of particular entities
- It is expressed functionally (can you perform 'as a geographer'?) rather than cognitively (can you state 'geography facts' or do 'geography tasks'?)

The New Model of Work and Learning



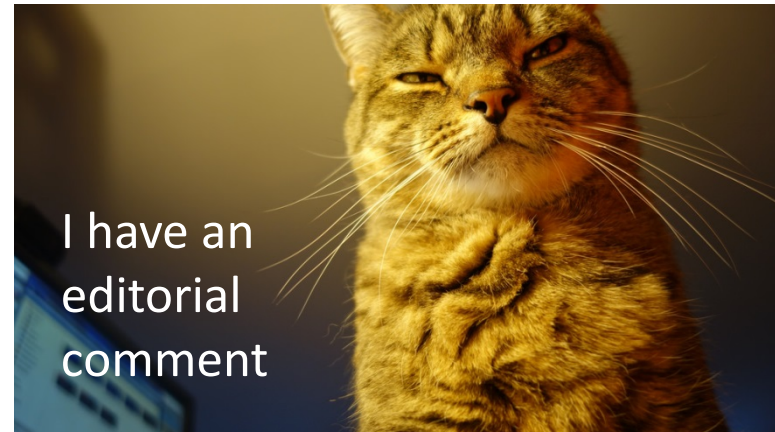
- **Sharing** - create linked documents, data, and objects in a distributed network
- **Contributing** - employ social networking applications of the Web to facilitate group communication
- **Co-creating** - work through networks that facilitate cooperative group work toward common goals

6. Strategies



Find Patterns

- **forms**: archetypes? Platonic ideals?
- **rules**: grammar = logical syntax
- **operations**: procedures, motor skills
- **regularities**, substitutions (eggcorns, tropes)
- **feature** similarities



Look for Meaning

- theories of truth / meaning / purpose / goal



Gananoque, Ontario, 2015

- **Sense and reference** (connotation and denotation)
- **Interpretation** (Eg. In probability, Carnap; Reichenbach; Ramsey)
- **Wagering** / strength of belief
- **Forms of association**: Hebbian, contiguity, back-prop, Boltzmann
- **Decisions** and decision theory: voting / consensus / emergence

Observe Practice

- What count as actions? What do they *do*?
 - **Actions** (J.L. Austin, Searle) assertives, directives, commissives, expressives, declarations (but also - harmful acts, harassment, etc)
 - **Interrogation** (Heidegger) and presupposition
 - **Meaning** (Wittgenstein - meaning as use)



Los Angeles, California, 2009

Make Projections

- reasoning, inference and explanation
 - **description** - X (definite description, allegory, metaphor)
 - **definition** - X is Y (ostensive, lexical, logical (necess. & suff conds), family resemblance - but also, identity, personal identity, etc)
 - **argument** - X therefore Y - inductive, deductive, abductive (but also: modal, probability (Bayesian), deontic (obligations), doxastic (belief), etc.)
 - **explanation** - X because of Y (causal, statistical, chaotic/emergent)

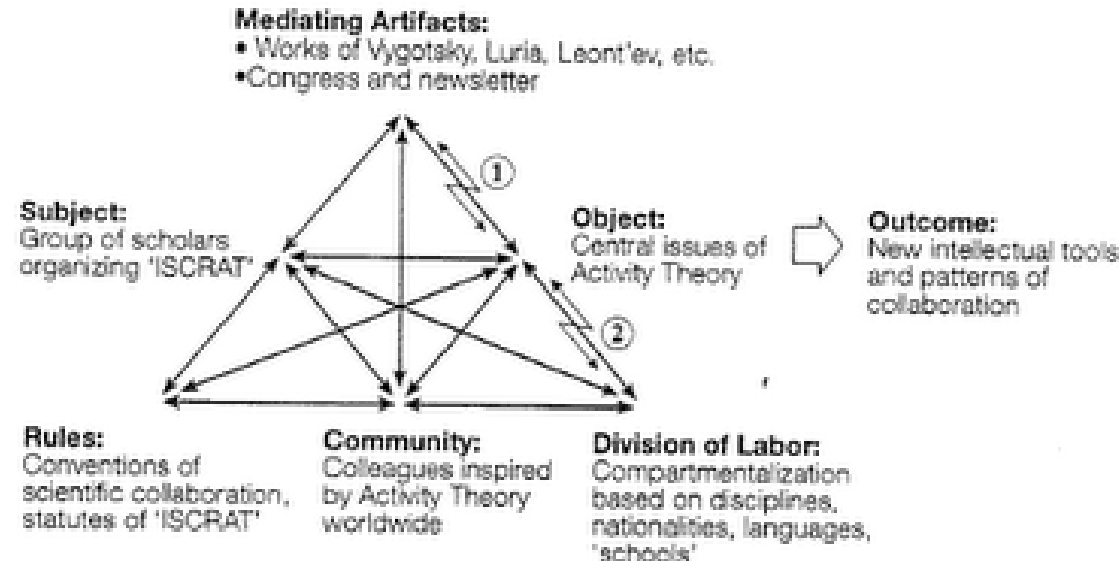
Consider Context

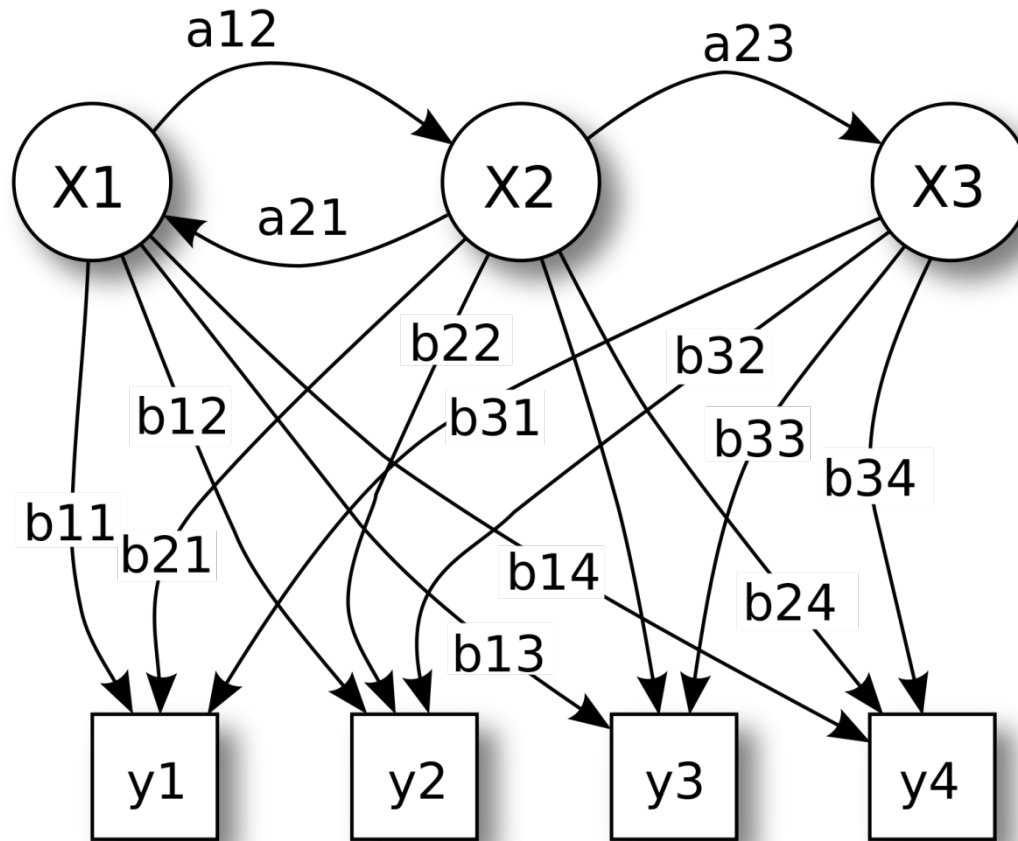
- **explanation** (why versus why not?)
 - Hanson, van Fraassen, Heidegger)
- **meanings** (culture, range of possibilities)
 - ('Analytic hypotheses', Quine)
- **vocabulary** (ontologies, logical space)
 - (Carnap, Derrida);
- **frames** and worldviews
 - (Lakoff)



Manage Change

- **relation** and connection: I Ching, logical relation
- **flow**: Hegel - historicity, directionality; McLuhan - 4 things
- **progression** / logic -- games, : quiz&points, branch-and-tree, database
- **scheduling** - timetabling - events; activity theory / LaaN





Our conception of knowledge itself is insufficient to account for these various dimensions of literacy.

Knowledge as Recognition

Image: https://en.wikipedia.org/wiki/How_to_Create_a_Mind

Stephen Downes



Moncton, Canada, 2005

<http://www.downes.ca>