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Benchmarking Synergy Levels Within Metadesign:
International Standards that Encourage Joined-Up Lifestyles

Professor John Wood, Goldsmiths, University of London

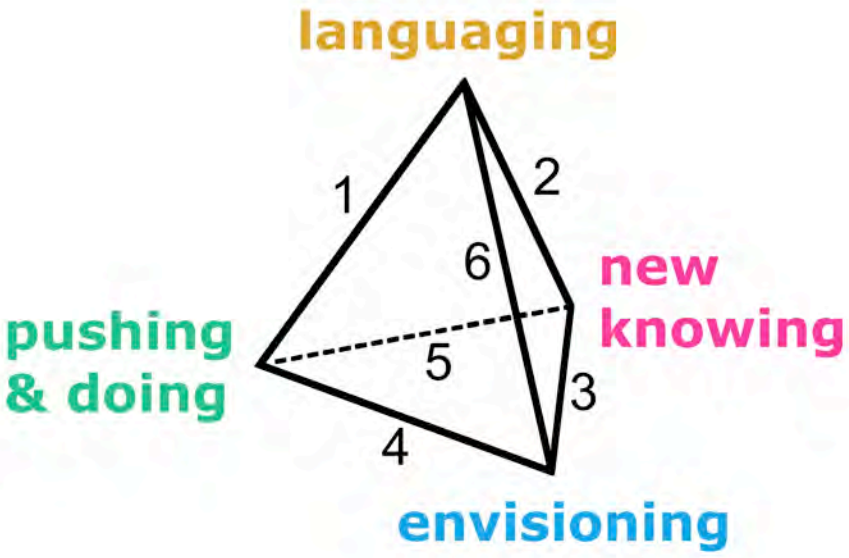

Figure 1 - Tetrahedron Showing relations between the four 'working styles'

Introduction

How much social, and ecological responsibility should designers be given, in the 21st century? This was a question we asked ourselves in 1989, when we launched our ambitious design degree 'Total Design' – now called, more modestly, 'BA (Hons) Design' – at Goldsmiths, University of London. In seeking to take the moral high ground, we wanted designers to see the bigger picture. This was a risky strategy. Instead of giving students the requisite design skills, we discussed ethical and environmental issues, all the time. We broke many taboos and got away with it. "Your students will never get jobs", one expert warned us. But we were onto something. Indeed, the course received top rating in a recent UK Student Union employability poll. Our first masters degree, MA Design Futures, adopted a similar approach, except that it brought together students from a wide variety of specialist practices and cultures. We hadn't seen all these processes as research, but they probably became the intellectual foundation for our subsequent research into metadesign, one of the 'Designing for the 21st Century' projects. Three of the key researchers in our team, Hannah Jones, Anette Lundebye and Mathilda Tham, were Design Futures graduates. Each, in different ways, had a strong interest in ethical and environmental issues. Together with two other lecturers, John Backwell and Julia Lockheart, and under the watchful eye of our administrator, Ann Schlachter, we gradually grew together as a research team. This process was achieved with the help of co-authorship tools provided by Jonny Bradley, our wiki website programmer.

Many things have happened since our 'metadesign' project began. Mathilda Tham received praise for her doctorate, and became Visiting Professor of Fashion at Beckman College of Design, in Stockholm. Hannah Jones began a PhD and became a 'metadesign researcher', at Central St. Martins, UoAL. Julia Lockheart also began a PhD that looks at co-authorship within metadesign, and other creative practices. In partnership with the project's Principal

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Investigator, Julia also launched the journal of Writing in Creative Practice (Intellect Books). So far, the team has devised over 90 metadesign tools, given 13 keynote lectures and 8 public talks, written 12 conference papers, 12 journal articles, 9 book chapters, published one book and completed one other. A distinguished university department in the UK has commissioned us to write a Metadesign masters programme, and we have presented our findings at universities in the UK, Germany, Switzerland, Norway, Sweden, Hong Kong, Italy and the USA. In Asia, our Japanese associates conducted their first commercial metadesign project and a Korean university renamed its MA design programme 'Metadesign'. Even before we had finalised them, several commercial companies were asking to use our 'metadesign tools', and several more wanted specific services. The project's Principal Investigator was invited to join 'Building Futures', the RIBA's urban planning Think-Tank. He has advised Arup and Partners, Deutsche Telekom, and the Korean government.

Our starting point for this two-year research project was to question the idea of 'sustainability' and to see whether the pursuit of 'synergy' would be a better design agenda. Where the logic of 'sustainability' emphasizes targets and constraints within a moral framework, our 'diversity-synergy' approach optimizes co-creativity and fun. In theory, this seems like a simple idea. Synergies already exist, everywhere, and no additional resources should be needed for designers to synergize them with one another. This is an ambitious idea, because it works at a level of complexity that is beyond individual thought. We therefore developed a methodology that we call 'metadesign'. It must be comprehensive enough to service whole systems, and it must be self-reflexive enough to re-design itself, when necessary. The following principles give a clue to what it might offer:

1. **Auspicious** (focuses on the affirmative, optimistic and serendipitous)
2. **Fractal** (complex systems made navigable through pattern-familiarity)
3. **Holistic / Holarchic** (complex, comprehensive / whole-aware outcomes)
4. **Opportunity-Making** (uncovers unexpected potential for elsewhere)
5. **Paradigm-shifting** (seeks to make human culture more ecological)
6. **Reflexively innovative** (holistic innovation acknowledging interdependence)
7. **Resists description** (seeks to make the unthinkable possible)
8. **Self-steering** (adapts by re-languaging its own working language)
9. **Synergistic** (cultivates and harnesses team complementarities)
10. **Synergy-seeking** (aspires to a beneficial 'synergies-of-synergies')

In order to integrate and transcend the limitations of individual specialists, metadesign would require a sophisticated level of teamwork. This was obviously a daunting task, so we sat down with our post-doctoral researcher and explored some ecological principles, hoping they might inform a practical approach. When this seemed too ambitious, we looked further into reconciling the practical, psychological and theoretical aspects of team creation.

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Figure 2 – Story-telling workshop


Figure 3 – Story-telling workshop

One of the challenges of developing a diversity of complementary approaches is the problem of orchestrating team communication at all the required levels, i.e. somatic, emotional, cognitive, intellectual, etc. For example, some consultants seemed unable to work with others of a different cognitive style. It is well known that personalities who 'adapt' to new situations often do not get along with 'innovators', i.e. those who prefer to create new rules and conditions (Kirton, 1980). Inspired by theories from management (e.g. Belbin, 1993; Adizes), psychology (Myers-Briggs, 1980; Herrmann, 1990) and the life sciences (Maturana & Varela, 1980) we tried to emulate how effective organisms function, and survive. In one approach we divided guest designers, and other experts, into four teams, each with a different cognitive style, and each managed by a researcher.

1. Hannah Jones coordinated the 'Pushing Doing' team
2. Anette Lundebye coordinated the 'Languaging' team
3. Mathilda Tham coordinated the 'New knowing' team
4. John Backwell coordinated the 'Envisioning' team

By mapping the four styles as a tetrahedron (see Figure 1) we were then able to identify their six relations as follows:

1. Languaging links to Pushing&Doing as CATALYSING
2. Languaging links to New Knowing as NUANCING
3. New Knowing links to Envisioning as INNOVATING
4. Envisioning links to Pushing&Doing as PROTOTYPING
5. Pushing&Doing links to New Knowing as ASPECTING
6. Languaging links to Envisioning as RELEVATING

The four categories evolved in the light of the personalities and aspirations of our researchers. Hannah Jones was eager to act as leader for the 'Pushing Doing' team. She is currently conducting research into the 'awkward spaces' of cities, and enjoys logistical challenges. As a trends forecaster, with a PhD in futures studies and ecological fashion, Professor Mathilda Tham made an admirable coordinator of 'New Knowing' activities, and while John Backwell's training in engineering and mathematics may have seemed an unusual basis for coordinating the 'Envisioning' team, his contributions made a wonderful complement to the skills of others. Anette Lundebye was brought in for the first year, due to Julia's maternity leave, and helped catalyse an understanding of 'languaging'. The second phase of the project coincided with Julia's return and as the initial four teams format had evolved, Julia's fresh insights and contribution helped expand the cognitive roles and open up a fresh perspective on team synergies. It is interesting to speculate how our research might have had different outcomes had roles been exchanged. For example, where Julia's specialist concern currently focuses on writing and dyslexia (she runs the

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international Writing-PAD Network), Anette is a multi-lingual facilitator who usually works at the level of face-to-face communication. Our programmer, Jonny Bradley provided an additional, and important layer within the system. By co-designing the Wiki software with us he facilitated the co-authorship of everyone. This provided another layer of asynchronous 'team consciousness' (Backwell & Wood, 2009) that maintained momentum and output. Also, in collaboration with the PI, Jonny developed a unique 'video-wiki' co-authoring editor that enabled researchers to co-edit, then annotate, our video documents.

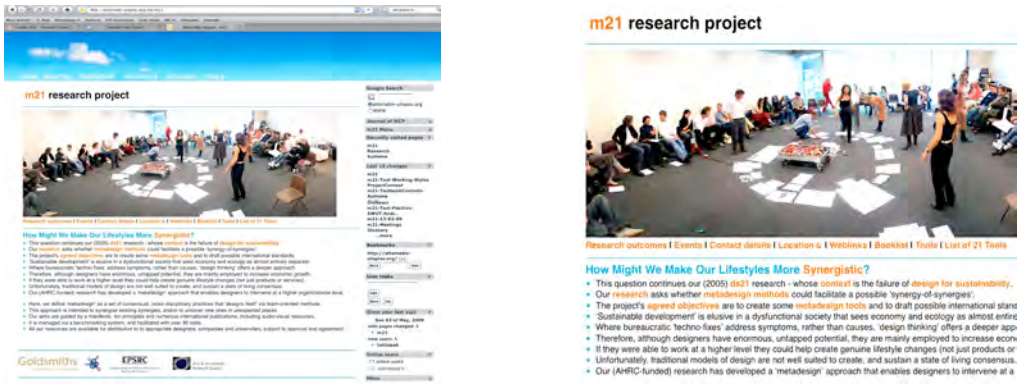

Figure 4 – Screen shots of our m21 Wiki website at 'Attainable Utopias'

We were fortunate to enjoy the support of a very large, and distinguished team of advisors, drawn from fields ranging from robotics to micro-economics, and from mathematics to healthcare. Some were pioneers drawn from design, science, or architecture, including Bill Dunster, Dr. Malcolm Evans, Dr. Ken Fairclough, Ayako Fukuuchi, Nic Hughes, Colm Lally, Michela Magas, Dr. Otto van Nieuwenhuijze, Jan-Marc Petroshka, Rich Walker, William Warren, Emily Wilkinson, Dr. Nicola Wood and Hyaesook Yang. Others were distinguished experts from many universities. The list includes Prof. Karen Blincoe, Prof. Rachel Cooper, Prof. Clive Dilnot, Prof. Mark Dinverno, Prof. Naomi Gornick, Prof. Keith Hart, Prof. Tom Inns, Prof. John Chris Jones, Prof. Phil Jones, Prof. Ezio Manzini, Prof. Michael Punt, Prof. Martin Woolley, and Prof. Robert Zimmer.

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Figure 5 – First Metadesign Colloquium, Goldsmiths, University of London, 2008

Context

Most newspapers tell us that the world is, to use that fashionable term, 'unsustainable'. Our project challenged the paradigm of 'sustainability' but took the view that designers have a huge, untapped potential for improving things and would therefore need a new role. Unfortunately, historically speaking, our politics has tended to put social equality before living in harmony with Nature. This is evident from the relentless quest for full employment and ceaseless economic growth. It suggests that governments would prefer to ignore ecological solutions that would challenge the economic status quo. Instead, by encouraging a competitive trading mentality at all levels of society, they hope that poverty will vanish. But more trading means more selling, and there is a limit to what consumers want to buy. By helping the advertising and marketing professions to over-stimulate the market economy, and by assisting industries, such as healthcare and waste, designers not only work to create wealth, but they also work to repair the human, and environmental damage that it causes. Where GDP is used as an indicator of national wellbeing, this policy makes economic sense. Unfortunately, within a longer term, global perspective, it is disastrously counterproductive.

What caused this mess? One reason is our tendency to 'language' the world as a set of separate bits, rather than as a whole entity. This is why we address ecological problems without adjusting the economic mindset that caused them (e.g. a common interpretation of the 'sustainability' argument). This tendency to divide everything into isolated modes is not new. It is a legacy of Aristotle (384 BC – 322 BC), whose categorical mode of reasoning helped officials to manage the first great libraries of the world. It facilitated the organization of the Roman empire and it inspired later thinkers, including John of Ockham, (1285-1349), Rene Descartes (1596-1650), Isaac Newton (1643-1727), Gottfried Leibniz (1646-1716), Immanuel Kant (1724–1804), Charles Babbage (1791-1871), George Boole

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(1815-1864), Frederick W. Taylor (1856–1915), Marvin Minsky (b., 1927) et al., whose combined efforts led to digital databases, GPS navigation and Google search algorithms. The world is a living entity but categories are lifeless. Nevertheless, categorical reasoning drives the great corporate bureaucracies that manipulate governments everywhere. It is why we have an education system driven by targets, league tables and tick-boxes. It is why, as consumers and citizens, we are licensed to choose, but not to dream. Categories dumb us down and give us tunnel vision. They encourage us to address the symptoms, rather than the cause of the problem. How can we design a more joined-up world? The first step is to look below the surface. (Meta)designers must challenge the Fordist approach that separates whole tasks into specialist bits, and that use hierarchical management to create 'economies of scale' (i.e. rather than ecologies of scale).

The good news is that designers could take more responsibility for the whole picture, rather than getting sucked into the detail. Designers are underestimated because they are often asked to solve problems at too late a stage, or at a level that is too narrow, brief and superficial. What would happen if the United Nations were to ask them to organize banks and governments? How would they go about keeping the peace, eradicating poverty and creating a democracy based on imagination? What we have developed is only a starting point. It is a benchmarking system consisting of twenty-one metadesign tools, designed to co-create, and to orchestrate synergies on many levels. In our project, we always knew this was going to be difficult. For one reason, 'synergy' is elusive, and does not respect boundaries or traditions of thought. A more complete understanding of this problem will require resources far beyond our three-year study. However, it is vital to 'dream' beyond the possible. Metadesign must steer 'realities' at the level of actions. Actions are guided by habits, habits are guided by language, and language can be steered by creative thinking. This may help to explain the purpose behind our tool-kit.

What we realized is that we needed to balance the diversity and the scale of teams to achieve an optimum level of 'team-consciousness'. This is similar to the idea of 'wisdom'. However, where people often identify wisdom with the sagacity of a prophet, or wizard, we increasingly understood it as a comprehensive, and emergent outcome of many actions that coordinate themselves in, and beyond, a given locality. Buckminster Fuller explained this in 1975, when he said: "The synergetic metaphysical effect produced by the interaction of the known family of generalized principles is probably what is spoken of as wisdom" (c.f. Fuller, 1975, 153.00). For team-consciousness, or wisdom, to be emergent and ineffable, it must incorporate many perspectives within a whole vision. This is why no individual is ever extensive enough, in space and time, to be wise. But if each acts in accordance with the whole, rather than its own predilections s/he contributes to the emergent wisdom of the team. This is what Arthur Koestler described as a 'holarchy' (Koestler, 1967). When there is ample diversity within a holarchy, we figured, synergy may emerge. What we were not quite expecting, in our experiments, was success. We managed to facilitate two groups of five designers who, eventually, seemed able to emancipate themselves to act as 'flat', co-creative teams. The level of group alertness that pertained during the experiments, and the level of individual 'amnesia' that ensued, afterwards, was slightly uncanny. We took this as a tentative sign that the groups had operated holarchically.

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Figure 6 – Developing a mapping tool


Figure 7 – Evaluating a workshop

Methods / Approach / Journey

We know that designers can create 'smart' products, 'cool' services or 'cunning' businesses. However, in the era of climate change and species extinction, they need to cultivate wisdom, rather than churning out disconnected bits (Philogene & Wood, 2002). By cultivating diversity they can reveal more opportunities for synergy. In a cheap-fuel society, ubiquitous mobility is a lazy way to find diversity. By welcoming a true 'diversity-of-diversities' we increase the potential for constant local abundance (Fuller, 1975; Wood, 2007:1). Here, Hannah Jones's interest in Arthur Koestler's idea of 'bisociation' was invaluable, because it delivers possible synergies by combining two 'parent' ideas to produce a new one (Jones, 2007). "When two independent matrices of perception or reasoning interact with each other the result...is either a collision ending in laughter, or their fusion in a new intellectual synthesis or their confrontation in an aesthetic experience." (Koestler, 1964) This multifaceted outcome is, potentially, a 'win-win' situation, or even a 'win-win-win-win' situation (c.f. Wood, 2007:2) because metadesign is intended as a celebration of the journey, as well as its destination. In other words, metadesigners should be able to have as much fun being co-designers and co-producers as they do acting as co-critics and co-users.

James Surowiecki has shown how a crowd can seem to know more than any individual within it (Surowiecki, 2004). By gathering different types of creative expert with different kinds of knowledge we created one type of diversity. Unfortunately, increasing team diversity eventually means increasing its size, which encourages 'top down' management, which, in turn, reduces synergy. If you lengthen the chains of command, you increase the chances of misunderstandings and alienation. What is needed is an optimization of interconnections between teams of optimum density. The mathematics of Leonhard Euler (1751) and Richard Buckminster Fuller (1975) showed us that a four-player system provides optimum synergy because of its auspicious ratio of agents and relations (see Wood, 2007:1). However, the same mathematics also shows that the level of damage that a small minority of individual players can create is disproportionately large. For example, in a team of four individuals there are six relations. This means that each player is responsible for three (i.e. half) of the total number of relations. In other words, even one slightly disgruntled player (i.e. 25% of the team) can reduce the quality of creativity by at least 50%.

New knowledge and understanding

In 1997, looking for the best way to 'green' the world, Donella Meadows (1999) noticed that, although governments assumed that subsidies, standards, taxes and legal regulations were appropriate 'levers' for change, they offered far less 'leverage' than we needed. She concluded that a paradigm shift was necessary. But this is a truly radical idea, as Albert Einstein implied in his famous statement, 'We can't solve problems by using

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the same kind of thinking we used when we created them'. It is useful to see design categories, or methodologies, as 'paradigms', each with their own field of view. For example, when we think of the paradigm of 'ecological footprint' we probably think about justice and biological diversity. When we think about the paradigm of 'carbon footprint' we may just focus on energy. When we think within the paradigm of 'product design' we focus even more, perhaps onto solar panels and electric cars. 'Service design' (Manzini, 1994) is a marvelous way to integrate economic innovation with existing products. Within this paradigm we might speculate about solar electricity, electric vehicles and rental charges. Metadesign is intended to be a more self-reflexive superset of many other type of design. It is a kind of 'meta-paradigm' that encourages us, self-reflexively, to imagine better logistics, better cities, better accountancy, better agriculture, better healthcare and better banking – all unified within a new ecological / economic paradigm. Many designers underestimate the importance of language in informing beliefs and actions (Bhartrihari, 450-510; de Saussure, 1916; Wittgenstein, 1921; Sapir, 1949; Whorf, 1956; de Saussure, 1962; Kuhn, 1964; Lackoff & Johnson, 1980; Sperber & Wilson, 1986). By steering the appropriate metaphors we can revise the conditions that create what is 'real' to us.


Figure 8 – Anette collates 'envisioning' data


Figure 9 – Data from 'new knowing' team

By emphasizing the importance of 'languaging' within metadesign we believe we have discovered a promising way to initiate a paradigm shift. Our range of language tools included 'collective story-telling' and 'consensual values'. We found that these could help novice participants to invent, and agree, the self-defining concepts that help them to bind them together as a team. Designers need to do more than 'think outside the box'. They also need to *think outside the metaphor* of the box. 'The box' is only a mental picture, but it guides the way we think and behave. In saying that a 'paradigm-shift' is more powerful than legislation, Donella Meadows made an important discovery. However, our experience of holarchic groups suggests that we may need to find a less static metaphor. If designers can help society to adopt a less a materialistic, and more synergistic language it may find new ways of living that are currently 'unthinkable' (Wood, 2008). This may, ultimately, lead to what Richard Buckminster Fuller called, a 'synergy-of-synergies'. In setting up holarchic teams (Koestler, 1967), we found one tool, particularly helpful. The 'four-fold framework', enables metadesign coordinators to plan, and to conduct workshops. It guides participants from the experience of 'me' to the experience of 'we'. This is necessary because it is virtually impossible to grasp the emergent outcomes of the whole metadesign process until the following four levels of capability orchestrate themselves (Cf. Nieuwenhuijze & Wood, 2006):

1) When agents can acknowledge their individual consciousness
2) When agents can co-create interpersonal relations to create a team
3) When teams can acquire, and sustain team-consciousness

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4) When team-consciousness is sufficient to perform external tasks

Figure 10 – Participants using the 'Positioning Tool' at the Pines Calyx Workshop

Much of the work we did involved highly intuitive and performative practices, so we were fortunate to have Anette Lundeby and Mathilda Tham in the team. Anette is accomplished in commercial facilitation work, and Mathilda is a leading expert in conducting action research activities with major corporations. We also sought the advice of the Nowhere Foundation, who conducted some workshops for the whole team, and arranged for several of us to be given additional training in running gestalt psychology (i.e. Constellation) workshops. This further enabled us to coordinate complex information at an implicit, tacit and unconscious level. It informed the later development of one of our more important innovations, the 'Positioning Tool', conceived by John Backwell, Anette Lundebye and Batel Dinur. This enables creative teams to map their own somatic, and other, relations in a reasonably neutral way, emotionally speaking. Metadesign volunteers were therefore able to use it for diagnosing the prevailing interpersonal relations within their team. This is one of our most controversial tools, in that it is loosely based on the family therapy methods of Bert Hellinger (1925-), and these sometimes become rather emotionally charged.

While we were found the resulting insights invaluable, they were highly intuitive and experiential. It was therefore impossible to record them in any explicit way, and we also needed to formalize useful generalizations. The first thing we found, is that it seems 'unthinkable' (ethically and logistically) to design for synergy without 'designing' oneself, and one's team, self-reflexively into the equation. Working with John Backwell (Backwell & Wood, 2009) we tried to theorize the relationship, x↔y, that exists between agents in the network. We used a simple arithmetic to calculate how many mutual relationships (R_m) a

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given number of agents (n) could afford:

$$\mathbf{R_m = \frac{n(n-1)}{2}}$$

When extended to view x→y and y→x as distinct relationships (R_d), then:

$$\mathbf{R_d = n(n-1)}$$

Where the 'self-reflexive' element, x→x, is to be considered a relationship, (R_s), then:

$$\mathbf{R_s = n^2}$$

Figure 1 represents the presence of each node's 'need' for an unspecified unit of resource, as perceived by the others. This approach is inspired by the 'relonics' methodology devised by Dr. Vadim Kvitash (cf. Kvitash & Gorodetsky, 2003). In our system, all 'needs' are mapped as equivalent values, whether or not they can be met within the system.

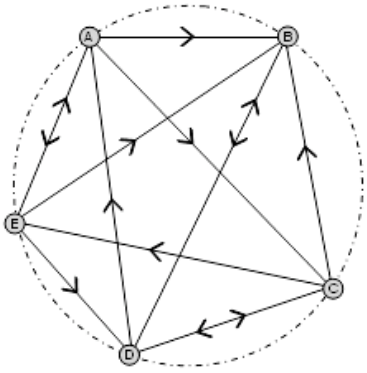

Figure 11 – Mapping the 'need suppliers' and the 'needy' within a team

In developing our ideas of metadesign, and synergy, our research team ran an international colloquium (c.f. http://www.attainable-utopias.com/tiki/Metadesign), which put our definition of metadesign within the scrutiny of twelve experts in the field. (See also George, 2007). We have come up with over 90 tools for synergies. Twenty-one of these were tested in a series of workshops. They were outlined and discussed at the 'Changing the Change' conference in Turin (Tham & Jones, 2008). Some were further evaluated at the Pines Calyx workshop, in Dover, UK, using parallel, matched design teams. This work represents a fundamental challenge to the physical sciences (e.g. Kelvin, 1852) whose pessimistic outlook influenced economic theory, and the idea of 'sustainability'. It is exemplified by the 'Law of Diminishing Returns' (e.g. Malthus), which offers a fundamentally entropic, dissipative model of the world. By contrast, our findings reflect a more imaginative, Darwinian framework that posits an emergent, systemic, negatively entropic worldview. This is exemplified in the 20th century idea of a 'Law of Increasing Returns' (Young 1928; Romer 1986; Arthur 1996) that gives a new, ecologically important role to creativity. As Paul Romer (1986) reminded us, 'Possibilities do not add up. They multiply.'

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