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Towards an Inclusive, Safe, Resilient and Sustainable City: Approaches and Tools

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Indice/Index

VALUATION AND EVALUATION IN COMPLEX REAL SYSTEMS: A SYNERGISTIC MAPPING AND POLICY TEMPLATE

Joe Ravetz

Abstract

This paper explores methods for valuation and evaluation, which are suitable for complex inter-connected "real" systems. Urban cultural heritage sites, or urban ecosystems, often contain multiple sources of value (economic, social cultural, ecological): such value is often generated by multiple collaborations, social learning and collective intelligence, and there are multiple policy objectives and system inter-connections to be evaluated. In contrast to the normal reductive assumptions of mainstream valuation/evaluation, such highly inter-connected situations call for new methods. This paper demonstrates the "synergistic" approach to valuation and evaluation, with a practical "evaluation template", and some examples from "Greater Manchester", UK.

Keywords: synergistic approach, evaluation template, Greater Manchester

STIMA E VALUTAZIONE NEI SISTEMI REALI COMPLESSI: UNA MAPPATURA SINERGICA E UN MODELLO STRATEGICO

Sommario

Questo articolo esplora alcuni metodi per la stima e la valutazione, adatti a sistemi "reali", complessi e interconnessi. Nel patrimonio culturale urbano, o negli ecosistemi urbani, vi sono molteplici fonti di valore (economico, socio-culturale, ecologico): tale valore è spesso generato da forme molteplici di collaborazione, di apprendimento sociale e di intelligenza collettiva. Pertanto, diventa necessario valutare obiettivi politici multipli e interconnessioni sistemiche. In contrasto con le ipotesi riduttive proprie di una stima/valutazione tradizionale, queste situazioni fortemente interconnesse richiedono nuovi metodi. L'articolo presenta un approccio "sinergico" alla stima e alla valutazione, con un "modello valutativo" operativo, ed alcuni esempi sperimentati per la "Greater Manchester", nel Regno Unito.

Parole chiave: approccio sinergico, modello valutativo, Greater Manchester

1. Introduction

The word "value" might cover many possibilities: market price, or ethical principles, ecological resources, or cultural beliefs. Could it be that a "value", and its close associate "capital", is not so much an "item" or "object"? Could it be more like the inter-connection of different domains of human experience (social, technical, economic, ecological, and so on)? For instance, the value of financial "capital" is only realized through spending on goods or services; ecological "capital" is realized when mobilized by human needs and activities. Other kinds of value are about sense-making, or what can be called "boundary objects": if we ask the "value" of a Van Gogh painting, we assume that someone can pay $50 million to buy and enjoy it, whatever that means. But a unique wildlife site in Manchester, or an empty church in Naples, may be less suitable for private ownership in many ways: so the economic value might be zero or boundless, and the social or cultural value, or the market proxy for such values, might depend on many assumptions. These are often shaped by a wider system of power or ideology, which can only be understood by deliberation and negotiation (Jacobs, 1997).

All this points towards a concept of value, and a methodology of valuation, which doesn't assume that everything should be an object for sale. Such "valuation" (i.e. *"estimation of something's worth, especially one carried out by a professional appraiser*"), then extends towards "evaluation", which is more about the considered "judgement" of success, feedback to policy objectives, or "*the making of a judgement about the amount, number, or value of something*"[1]. Again we can see the contrast between a reductive approach and one which is more inter-connected or "synergistic": the first assumes that policy is like a machine, with objectives which are neutral, and outputs/outcomes which are fully predictable. The second starts from a reality where policy is more nuanced and entrepreneurial, where its objectives are often controversial, and where the outcomes depend on social learning and collaboration: all of which calls for more than a reductive approach (Ravetz, 2013). It seems more useful to work with values as human-centred combinations: not only values for the functional and material, but those which are more about capabilities and "affordances", aspirations or identities, sense-making and significance (Norman, 2103).

The reduction of values to a market price is useful for some purposes, especially where prices are the metrics for decision-making. But for social, cultural or ecological values, which are more likely to be realized and mobilized by creative collaboration and social learning, we need a more creative process of evaluation to reflect this. So, this paper demonstrates an alternative: the "synergistic" approach to working with complex, inter-connected, "real" systems, which are shaped by the human factors of collaboration and social learning. The paper is based on the "Insights" chapter of the forthcoming "Urban 3.0" (Ravetz, 2015).

2. Sustainability as capital management

Many thinkers over 20 years have looked at how "sustainability" can be identified, assessed or valued, and the direct result is often in the form of a "framework" which can be "operationalized" with "indicators" or "benchmarks" (it's interesting that artists, anthropologists and some others see it quite differently) (Graeber, 2001). One such scheme was the "5 Capitals" approach by Forum for the Future and others, looking for a practical system to account for non-monetary assets and intangibles[2] (Porritt, 2007). This provided a

way into thinking about economic systems or business models, which could take on the five capitals or five value-sets, as a kind of bottom line to be maximized or optimized. Furthermore, it aimed to make visible the transfers from one form of capital to another, which is often the effect of enterprise or business activity.

This idea of capitals and transfers seems fine, until we get to some reality checks. For instance, the calculation of proxy market value of ecosystems generally assumes that social capital or social interactions are low or zero: otherwise the calculation becomes more complex and less "tractable".

In practice the difference between high/low economic valuation is very sensitive to the social/cultural inter-connections and context. For example, as a community architect I came to specialize in feasibility studies, in which the project building "value" was at the core (Ravetz, 1995). First I learned mathematical methods of property valuation; then I realized that the whole calculation depends on the "yield factor" (ratio of capital value to revenue), and the social psychology of confidence, risk, security, cultural alignments and future expectations, of the location and surroundings, whether "prime" (5-7%) or "secondary" (8-12%). If these yield factors are agreed between all, then it's a perfect equilibrium market (where in theory there are no profits to be made). If we assume that a building is in a "good" location with expectations of rising values, its capital value will be 15 times its rental; if in a "risky" location, the capital value is half that.

For a typical ecosystem problem, if we assume that a river is mainly there to supply 1000 tonnes of water to the nearby city, then its value is low but predictable; but if people use it as a cultural landscape, or if it serves some strategic purpose, then its value can be higher, although less predictable and more negotiable.

So here synergistic thinking raises very topical questions. Firstly, what is to be valued? – this might be simple and linear, or it might be complex, self-organizing and cognitive – in which case the "value" isn't well suited to representation as a single number, more like a field of creative possibilities. And another question: who is the "subject" or user of the valuation, and what is their agenda? On one end of the range is a mythical neutral technocrat, or at the other a social/ecological entrepreneur, or a complex community in flux and development. A third question is where does this information go and for what purpose? Is it mainly technical data for a technical calculation, or more about enabling of creative collaboration in a wider community? These three questions then open the door to a more holistic and synergistic approach.

3. The synergistic approach

From global "Grand Societal Challenges" to local urban development, we can see complex inter-connected problems and opportunities. In general these are shaped not only by "linear" mechanical-type systems, but also by "cognitive" human systems of social learning and collaboration. In response the theory and practice of "synergistics" has emerged. Together with the methods of "synergistic mapping and design", we can begin to respond to these more inter-connected and co-evolutionary problems and opportunities. The method begins by drawing a concept mapping of the inter-connections of the issue, with detail as suitable (it can be started on one piece of paper), then follows a cycle of questioning, thinking and mapping:

– scoping/landscape mapping (questions: who/what is involved, what are the inter-connections?)

- scenario/change mapping (questions: what are the drivers of change, trends, alternatives?)
- synergy/idea mapping (questions: which are the most significant and creative synergies and opportunities?)
- strategy/pathway/road-mapping (questions: what to do, sooner/later, who and how?)

With this 4-stage cycle, we can explore different and parallel types of change, co-evolution and "emergence", of new patterns and new systems:

- 1.0, linear change in "functional systems", responding to direct short term change (with an image of a large and complex machine);
- 2.0, adaptive change in "complex adaptive systems", evolving with longer term changes and transitions (an image of biology wilderness or garden);
- 3.0, synergistic change in "Complex Cognitive Co-Evolutionary" systems ("C3" systems), shaped by human qualities as thinking, learning, questioning, strategy, self-awareness, shared intelligence (this is suited to an image of a human situation).

Such a "3.0" model of synergistic change helps to understand the difference between a mechanical system and a human system. It also then highlights the difference between a blind, destructive, "winner takes all" system of economic extraction or political power and a more intelligent strategic and collaborative "C3" system. The 3.0 model then can be explored in almost any kind of human domain, for example:

1. Urban 3.0: a self-organizing, responsive city or region system, which provides the physical and spatial framework to enable livelihoods for all, with responsibility for its ecological effects, and promoting a social justice and equality;
2. Economy 3.0: systems of livelihood, production, finance and overall prosperity, which include social and ecological values, responsive to global limits, creative and resilient, self-organizing and stabilizing;
3. Governance 3.0: structures for participative decision-making and collective resource management, with citizen empowerment via collaboration, based on social learning and intelligence.

4. A visual thinking framework

Visual thinking is at the core of the synergistic method, with a combination of concept diagrams, semi-figurative systems mappings, and narrative cartoons (Ravetz, 2011).

Visualization enables a direct connection to the creative thinking of stakeholders, as seen on the flip-charts used in workshops and similar deliberations. The visual thinking framework here is a kind of template, a kind of thread which runs right through each of the "insights" of the 3.0 toolkit, including evaluation, analysis, risk and resilience, innovation and transition. Each of these brings a particular angle of view for working on complex "real" systems.

The template is shown here in two parts (Fig. 1 and Fig. 2). In each, the left hand side of the picture shows the linear and adaptive (1.0-2.0) system models; the right hand side shows the "synergistic" (3.0) model.

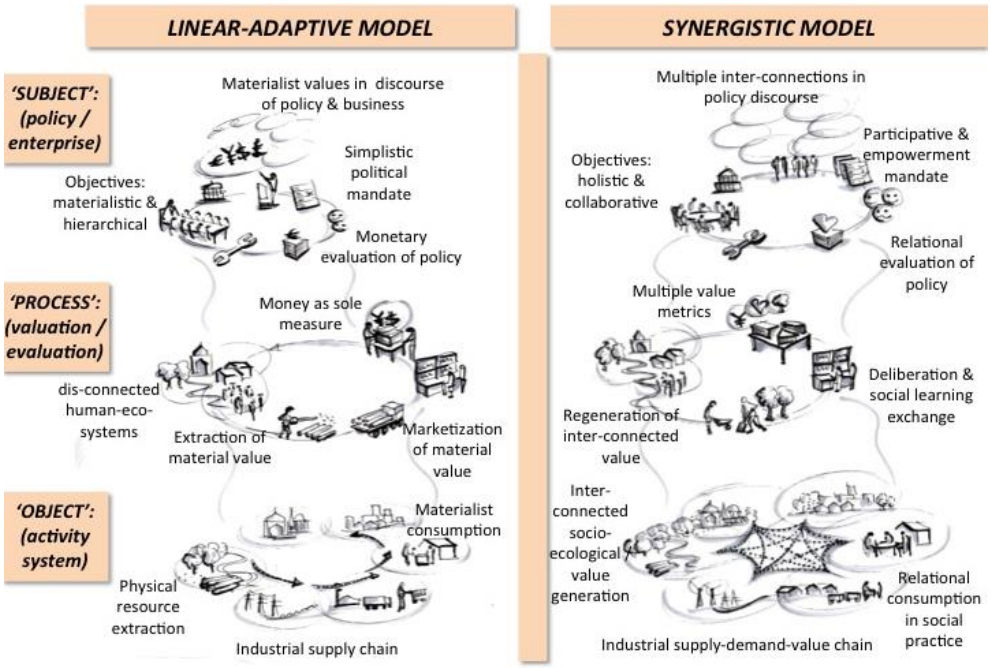
Firstly, a "semi-figurative" view shows sketches of little people, houses, cities, trees, etc., together with some of the main inter-connections, in three different layers (Fig. 1). Second, a more "analytic" view shows a concept-level flow chart: also with the main inter-connections of actors and factors, and also shown in three different layers. How to define

these layers in such complex inter-connected systems? A very practical approach is to look at the "subject-object-process" relationships.
At the top we see the "subject", the person or organization doing the valuation: the "cognitive entity" or policy system, or the business/enterprise which needs to know the value. And then below with the lower layer we see the "object": the thing being valued, the system which generates the value, or risk, or any other quality we're interested in. In the centre is the "process": the actual method of valuation/evaluation, which can be visualized as a "cycle" of generating knowledge. For instance the "process" of valuation starts with a fuzzy thing, whether a Van Gogh painting, a river, or a wasteland: then brings it into focus: and then looks for a mobilization or actualization (either taking it to an actual market to sell, or some other proxy way to define the value): and then we analyse the price, its conditions and context, leading to a final valuation, and so on. Again on the left of the picture, this "process" is focused only on material values (selling the forest for wood production): on the right hand side, the "process" is more holistic and inter-connecting of economic, social, cultural and ecological kinds of value.

5. Valuation as co-evolutionary learning

Overall this visual thinking aims to highlight the co-evolutionary shift in valuation/evaluation: from a linear model, to an adaptive/extractive model, to a synergistic model (Fig. 1).

Fig. 1 – Values, valuation and evaluation: synergistic visual thinking



Linear type valuation seems suitable for linear kinds of assets (e.g. the river supplies 1000 tonnes of water per day), linked to tangible functions, such as drinking water or irrigation. On that basis an economic valuation is simple in principle: comparing with the market price of water from other sources, or a CVM type proxy valuation, based on how much would people pay for more water, assuming it's clear which people you ask, and how the questions are framed (which in practice is often not clear).

In contrast, extractive/adaptive type valuation opens the door to more creative thinking, with feedback or circularity or "gaming", in how people value the assets, in theory or practice. For water, we could hold an auction where the most entrepreneurial could bid, and the winner will have the highest "value" business plan for selling or using the water.

This is the assumed logic of marketization programs, from cost-recovery infrastructure, to carbon markets, and "The Economics of Ecosystems and Biodiversity" (TEEB) or the UK application, "Payment for Ecosystems Services" (Defra, 2013). Such models have the promises and pitfalls of adaptive-extractive systems: strong incentives for efficiency and innovation, alongside market manipulation, speculation, extortion, polarization and vulnerability to collapse. From experience, market-based values can work well, (a) if the market is deep and liquid, and the commodities are easily tradeable; and (b) if other political, cultural or ethical value questions are agreed or with strong consensus. In practice, water in countries with 100% supply is mainly a regulator technical/market issue; in others it's the subject of power conflicts, expropriation, cultural hegemonies, and the critical perspectives of urban political ecology. So how can the synergistic approach help?

First we assume that the "thing to be valued" is inter-connected and emergent (the river is a multi-functional and multi-value resource, not only as water at 1000 tonnes/day), and then, the services provided, or "capabilities" enabled by the water, are also inter-connected and co-evolutionary (e.g. opportunities for social innovation through wetland ecologies, cultural co-creation and local enterprises, rather than linear growth projections). Then we link the valuation results with a social deliberation, capacity/collaboration building and social learning process. We look at the possibilities for multi-functional landuse, for socio-ecological enterprise, and the collaborative stewardship of the river and all of its habitats. In practice these possibilities can be challenging to political economic or ideological power: in which case, the synergistic approach to valuation helps to find "win-win-win" opportunities for collaboration.

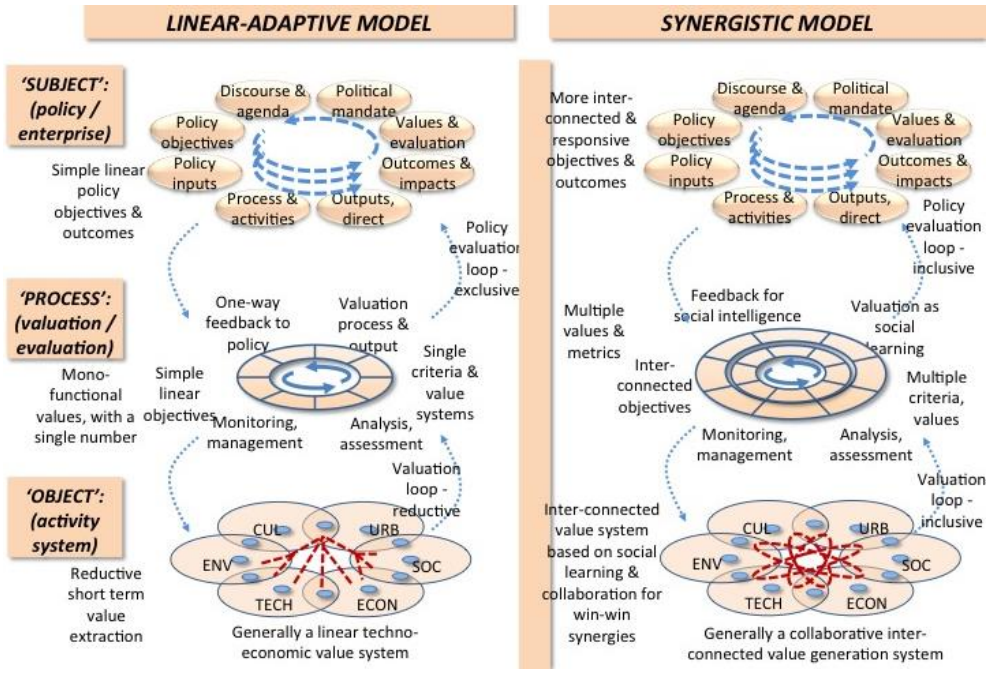
6. Evaluation as co-evolutionary learning

With a synergistic valuation on the table, we can then extend the knowledge cycle to policy evaluation. Similar thinking has emerged on evaluation of sustainability policy. For example if the policy objective is to build more roads, then it is a linear kind of task to measure the roads, the costs and performance, and provide an index or metric.

If however the policy objective is to "enhance urban accessibility and connectivity", then these are more like fuzzy, synergistic, multi-value qualities, and the outcome is not just a linear chain of policy and effect: it depends on the participation and creative thinking of users and stakeholders. Such questions emerged in a previous round of research on evaluation of "Regional Sustainable Development" (RSD), i.e. development which aims at greater integration between economic, social and environmental agendas (George, 2013; Ravetz *et al.*, 2004; Ravetz, 2007). This highlighted parallel trends, such as the rise of "rational management" and "evidence-based" policy, at every level of public governance,

even while the pressure for participation makes this task more challenging. There are trends in methods and tools, such as the extension of impact assessment to sustainability appraisal, lifecycle analysis, performance benchmarking and so on. There are technical innovations, such as remote sensing, social media and real-time databases, and in contrast there are many social innovations, in deliberative processes, community participation and organizational learning. With the benefit of recent insights from synergistic thinking, we can set out a more creative-collaborative evaluation agenda (Ravetz *et al.*, 2012): this is visualized in Fig. 2 with the "evaluation loop", which links the knowledge cycle back to policy. If we have a linear policy objective as on the left (e.g. building roads), then the system is framed as a linear system (needing materials, labour, land and money), and the evaluation is a linear calculation (measuring the inputs against outputs and targets).
If on the other hand, we have a synergistic policy objective (e.g. connectivity and accessibility), then the urban system is framed as complex, self-organizing and self-learning, in the sense that travellers "learn" about cycling or tele-conferencing, while employers "learn" that flexible working hours can increase productivity.

Fig. 2 – Values, valuation and evaluation: analytic mapping



This points towards an urban system which can be more collaborative and co-intelligent, as and where collective actions can enhance accessibility: for example, policy innovation for pedestrian zones, social innovation for "walking buses", or business innovation for employee travel budgets. Following through, the policy and governance esystem then needs

to enhance its learning and intelligence, to respond to such creative opportunities. Finally, the evaluation cycle at the centre of the picture needs to respond to this, so it can identify and promote more intelligent policy and governance approaches.

7. Towards a synergistic evaluation tool

In all this, however complex the question, we need simple practical tools. Here we demonstrate an evaluation framework which is deliberately simple: a matrix on one sheet of paper, to help the process of deliberation, visioning, analysis and evaluation.

The basic idea is to look for signs of co-evolution and social intelligence, in different domains, and also in the cross-cutting issues. Some would call for an "Urban Intelligence Index": we would crunch big datasets, and produce global league tables, with clever info-graphics and op-eds. This could be about as problematic and misleading as measuring IQ in different countries.

Recent experience with the City Prosperity Index and the City Resilience Index shows more or less the state of the art (UN-Habitat, 2012; Arup *et al.*, 2014). The first index seems to show that the hubs of former imperialism, such as Paris or Vienna, are top of the prosperity list (having expropriated vast resources from their former colonies). Meanwhile the Rockefeller City Resilience Index/Framework sets out 10 principles, which look rather similar to the sustainable city checklists of the 1990s. These again look plausible on the surface, but there is little mention of the geo-political dynamics (trade dependency, under-development policies, rapacious lending, peripherality and corruption, resource curses, etc.), which have produced such lack of resilience.

A more nuanced evaluation approach would be more useful, to take account of multiple views, boundaries, values and power structures. This could be along the lines of the EU "Open Method of Coordination", generating feedback and mutual learning, comparison and improvements, and highlighting areas of strength or weakness. In this way evaluation isn't all about "assessment" with external criteria and a surface appearance of objectivity: it's more about feedback for organizational learning and strategic intelligence.

Our evaluation template here (Table 1 and Table 2) reflects this approach. It aims to be simple and flexible to respond to almost any theme or policy question. Following the logic of the visual thinking above, it basically puts up a "linear-adaptive" model, side by side with a synergistic thinking model. The rows show the typical "domains" in the STEEP format, in a list which can be changed or extended to suit the issue. The rows also include for inter-connections of actors, inter-connection of factors, and of actions. Numbers or other metrics could be inserted if these are robust and useful knowledge, but after many experiments, we can say that most of the qualities we're looking for are highly qualitative, inter-subjective and "between the datasets". In that case, a rough "A-B-C-D-E" type rating is probably more useful than any number, however scientific its appearance. The real point is to use such a template, with any possible improvements and customizations, for continuing feedback, deliberation and learning between all concerned.

We demonstrate this evaluation template with a "home" example: the Greater Manchester Strategy (AGMA, 2013).

Greater Manchester shows a better model for city-region development and metropolitan governance, than most others in the UK: its position as the UK's (more or less) second city, and centre of Northern England is positive; its politics are generally pragmatic and collaborative (unlike for instance, Liverpool, which went through a radical socialist phase)

(Ravetz, 2014). As the world's first globalized industrial city-region, Greater Manchester (GM) was a model of free market capitalism: it was also a major hub for socialist and cooperative thinking. After a half-century of de-industrialization, (1950-2000), it's now a service and consumption-based second city to the UK. Ethnically, it's one of the most diverse: apparent unity around sport and music, but with widening gaps between the secure and precarious, the older or younger, those included or excluded from the system. Technologies and infrastructures are typical of an OECD economy, with strong science and education institutions, but the digital (IT) transition continues to disrupt everything. The economy is diverse, but polarized and under-productive, with reducing manufacturing sector, and growing debt-based consumption and property inflation.

The city-region ecology has been partly restored but now shows the challenge of affluence, by displacing its material inputs, outputs and climate emissions around the world. Governance struggles with the austerity and the public deficit, lack of public trust, and the centralizing forces of the UK (in spite of recent moves for devolution of some development budgets). Urban form and fabric is mainly old and inefficient, fragmented in ownership and investment: urban economies and urban lifestyles have taken over a wide rural area. The GM Strategy is one of a continuing series which began in this city-region format in the 1960s (Kitchen, 1997). The summary states: «This new strategy for Greater Manchester fuses together our strong plans for reforming public services with a continued drive for growth and prosperity. Our objective is to sustain progress whilst eliminating the gap between the taxes we raise and the resources we expend on public services. We want to deliver services differently, more efficiently and reduce the level of demand for those services, by bringing more people into higher quality work» (AGMA 2013, p. 6). This raises many critical issues. Firstly, it assumes that public services are in urgent need of reform by "strong plans"; secondly that the drive for "growth" must continue at all costs. Then, that "public services" are framed as for the unemployed, and as soon as people are in work the need will reduce. This is not the place for an indepth analysis of the dilemmas of the UK socio-political-economic system, or the austerity and deficit agenda. So this sample evaluation is a more strategic overview, an ongoing work in progress for debate: it was discussed in an earlier form in the GM Policy Exchange program, and now continues with the "Future of Greater Manchester" program.

The basic aim is to consider the success or otherwise, "in their own terms", of different models of strategic policy, as represented in the Greater Manchester Strategy and the discussions around it. This is not a value-judgment of whether one is better than another, as each model has a role to play: however the co-evolutionary "proposition" is that synergistic problems are likely to require synergistic responses, of social learning, creative collaboration and shared intelligence. So the rating is a simplistic indicator, where A=very good, and E=very poor, in terms of the systemic model performance in each domain (there is a further category of X=very high uncertainty). And to reflect an often complex picture, the rating can be shown in more than one level, e.g. "B/D", and so on. Again, the purpose of the rating is not to appear "scientific", but rather to generate deliberation and improvement. Where more detailed and quantitative modelling or impact assessment is feasible (more often on the 1.0-2.0 left hand side of the page), then of course this would be part of a more in-depth evaluation. The Tables 1 and 2 show the "linear/adaptive" models in terms of basic provisions or market activity, and the "synergistic" model as self-learning

feedbacks across the whole system for social intelligence. For the "subject/process/object" scheme as shown in the visual mapping above:

- the "subject" is the "evaluator" or the organization who is interested, in this case the community of policy-thinkers, academics and civil society organizations;
- the "process" is the evaluation activity, in this case an informal deliberation which feeds into various kinds of sustainability and futures studies;
- the "object" is the city-region and all its systems, as described in the rows of the matrix.

Tab. 1 – Synergistic evaluation matrix: the Greater Manchester Strategy

	"1.0-2.0" policy models: based on linear thinking	**Evaluation: GM strategy**	**Rating**	**"3.0" policy models: based on synergistic social learning**	**Evaluation: GM strategy**	**Rating**
Inter-connections of actors	Actors are mobilized via structures of power and ideology	Some actors mobilized/included in policy-making circles, others are left outside	C/D	Actors mobilized via collaboration and intelligence	Some directions for inclusion and participation: experiments in ICT platforms	D/C
Inter-connections of values	Dominant value systems are prioritized and reinforced	Neo-liberal material values of private profit, public austerity, decline of society	C/E	Diversity of value systems are included and linked	Much diversity of values and sub–cultures, but difficult to link to policy process	C/D
Social /community domains	Social and community structures are enhanced and extended	Cosmopolitization and mobility, social diversity, ageing, restructuring, skills and livelihoods shift	C/D	Social and community structures are transformed and evolved	Many aspirations, but slow progress to a more connected and inclusive society	C/D
Technical/ infrastructure domains	Technological systems are mono functional, with capacity for disempower-ment	Infrastructure is centralized and privatized. ICT transition is rapid and disruptive	B/C	Technological systems are multi-functional and empowering for all actors	ICT change is rapid and unpredictable: benefit to large corporates: potential in new social media	B/X
Economic/ employment domains	Economy and finance are materialist, extractive, monopolistic	Recent part recovery based on services, debt-based consumption, property inflation and precarious jobs with under-or mal-employment	B/D	Economy and finance are diverse, re-propriative, multi-stakeholder	GM is Cooperative movement hub: many experiments in socio-ecological enterprise, cultural creation, crowd finance, etc.	D/B

Tab. 2 – Synergistic evaluation matrix: the Greater Manchester Strategy

	"1.0-2.0" policy models: based on linear thinking	**Evaluation: GM strategy**	**Rating**	**"3.0" policy models: based on synergistic social learning**	**Evaluation: GM strategy**	**Rating**
Environment /resources domains	Environmental actions are localized, selective, externalizing	Some actors mobilized/included in policy-making circles, others are left outside	C/D	Actors mobilized via collaboration and intelligence	Some directions for inclusion & participation: experiments in ICT platforms	D/C
Policy/ governance domains	Pol. systems based on hierarchy, alienation, expropriation	Neo-liberal material values of private profit, public austerity, decline of society	C/E	Diversity of value systems are included and linked	Much diversity of values & sub – cultures, but difficult to link to policy process	C/D
Cultural domains	Cult. patterns reinforce ideological dominance & competition	Cosmopolitization & mobility, social diversity, ageing, restructuring, skills & livelihoods shift	C/D	Social and community structures are transformed and evolved	Many aspirations, but slow progress to a more connected & inclusive society	C/D
Urban-spatial domains	Spatial structures enable regimes of alienation and disempowerment	Infrastructure is centralized & privatized. ICT transition is rapid & disruptive	B/C	Technological systems are multi-functional and empowering for all actors	ICT change is rapid and unpredictable; benefit to large corporates, potential in new social media	B/X
Inter-connecting actions	Policies & actions are short-term, disconnected, mono-functional	Recent part recovery based on services, debt-based consumption, property inflation & precarious jobs	B/D	Econ. & finance are diverse, re-propriative, multi-stakeholder	GM is Cooperative movement hub: many experiments in socio-ecological enterprise, cultural creation, crowd finance etc.	D/B
Overal evaluation	Overall linear/ mechanical system: adaptive/ biological type system	Partial success on 2.0 model development, for half the people: for others, rising vulnerabiity	B/D	Overall synergistic system: based on synergy & collaboration, social learning & intelligence	GM has aspirations for a more 3.0 type model: many barriers but some signs of potential & progress	D/B

8. Urban ecosystems valuation and evaluation

Turning to other kinds of valuation and/or evaluation, urban ecosystems are a topical example. The TEEB programme aims to bridge the gap between two parallel kinds of value: the "embedded" ecological values, and "tradeable" monetary values (TEEB, 2010). But this can be problematic: in framing the "true value" as a number, whether in money or multi-criteria priorities, it bypasses the more synergistic qualities of both ecosystems and

human systems. We can start by letting economics out of its "utilitarian box"; then we can look beyond the numbers to the relationships between ecosystems and human systems, with many opportunities for synergy and self-organization on both sides.

For instance, in GM as elsewhere, the practical question comes up: how to value local ecosystems and ESS which are under pressure for development? The area of mossland and peat in the west part of GM had a valuation study for the peri-urban project PLUREL (Ravetz and Warhurst, 2013). With a review of many current studies and methods of CVM, the market value was established with a high of £300, and low of £3 per hectare, and mid-point (log-scale) of £30 per hectare. Such numbers often take a reductive and mechanistic view of social or ecological systems: as soon as policy opens the door then a development site valuation in the region of £1 million/hectare applies, and another unique ecosystem will be lost for short term development profit. Another local study looked at a semi-derelict urban parkland in north Manchester: as a magnet for crime and anti-social behaviour, with polluted water and degraded woodland, its proxy value appeared to be negative and ripe for redevelopment (Tippett *et al.* 2007; Roberts *et al.*, 2009).

In response, a low-cost community-based programme set up life-long education, healthy living, capacity building and eco-restoration activities, the park is now well loved and maintained, with a large net positive value.

Here the concept of "valuation" begins to overlap on "evaluation", where many creative possibilities emerge. A project in Australia for example, turned around the whole concept of policy evaluation: an interactive mobile exhibition/workshop process engaged stakeholders in an area of acute water shortage, enabling multi-way communication and collaboration, which in turn enabled a much more effective policy (Vanclay *et al.*, 2004). The implication is that "value" isn't just a metric of pseudo-scientific accounting, but there to be co-created, as an enabler for creative design of opportunities and synergies.

9. Urban cultural heritage valuation and evaluation

Urban cultural heritage (UCH) can be built up over hundreds or thousands of years, through the co-evolution of geographic features, cultural or political events, social or economic change, and ecological assets. Such heritage often suffers physical destruction or degradation: economic disinvestment and social dislocation, where the indigenous active users of temples, marketplaces, etc., are in decline, or displaced by higher value tourists, service industries or cultural expropriation.

Heritage valuation by rational "linear" thinking is a long running problem: trying to measure the social impact of a disused church, for example, brings on multiple layers of contingent valuation or hedonic pricing methods, resting on untested assumptions. Much of this is based on heritage valuation by "extractive/adaptive" thinking, which is more straightforward in principle: we put the church up for auction to find its market price, or construct an imaginary market to do the same, but then we discover that unique historic assets are sacrificed for short term gain. This all points to a "synergistic" thinking for valuation: not as an add-on to a linear method, but essential for cultural heritage of all kinds. How would this work?

The method starts with urban cultural heritage (UCH), not so much as an item or commodity, more of a "relational" resource and process, depending on interactions and value-chains between material objects, places, histories, narratives, worldviews, communities and individuals.

At the centre is a "relational value", not only functional/monetary, but social, ethical, political, etc., and generated by the inter-connections and relationships between these objects, places, histories and so on. As above, these "values" are less like fixed items, more like potential energy, potential innovation or potential for relational activity (for example, money in the bank, a social construction which is directly useful only when circulated). So we need a way to explore systematically, with all concerned, the synergistic potential of a cultural heritage. In this case, realizing the UCH value is not only about past history, but future opportunities. So we look for new adaptations of the built heritage emerging around new functions and services: and new patterns of creative learning and collaboration, which can emerge around the adaptations. Then we look for new socio-cultural perceptions and aspirations, which form around these collaborations. We look for socio-cultural communities forming around these perceptions and aspirations, and new financial models can form around these new communities. In turn, new functions and services can emerge around these financial models, and so on around the cycle.

The next and wider challenge is to evolve the "policy system" of urban planning, property law, public investment and policy appraisals, which can enable and promote this more creative and synergistic approach. Sometimes it happens through the contradictions and confrontations in the standard materialistic system. In many cases of social innovation, community action groups will campaign to save and re-use UCH, seeing opportunities which are missed by the mainstream (Hamdi, 2004; Wates, 2000). Or in eco-innovation, new uses are found for natural materials with a positive role and identity in the landscape. In the wider view, we can see valuation, not so much as an objective study, but more embedded in the processes of thinking, deliberation, collaboration and social learning. So the matrix summaries may be useful in transferring to other external users, but the real value is in the process of deliberation, capacity building and shared learning between all stakeholders. In that sense the heritage or ecological valuation is linked to parallel processes in economic and political self-organization.

10. Conclusion

This short exploratory paper aims to show that there is an agenda for valuation and evaluation, beyond a reductive and materialist calculus, to respond to the multiple inter-connected "value generation" which can emerge through social learning and creative collaboration. Furthermore, it shows that where the "object" of valuation/evaluation is shaped by social learning and creative collaboration, this also calls for the "subject" and the "process" of valuation/evaluation to be oriented in a similar direction. Finally, the wider role and purpose of valuation/evaluation can be seen not only as "objective" information for a technocratic governance, but as an essential feedback cycle for organizational learning and creative collaboration.

We can see numerous ways for this synergistic approach to grow and develop: one example is in policy evaluation in urban spatial planning. The conventional approach is to take high-level objectives such as fulfilment of housing need, and filter down with known parameters to numbers of housing sites. A more synergistic approach looks more widely at socio-political and institutional barriers and syndromes: explores creative and collaborative opportunities, and maps out pathways for social learning and shared intelligence which can respond. In the case of housing, this would look for opportunities with inter-generational transfers, multi-career households, young transients, under-occupation, short life licenses

and other alternative options. Similar thinking could apply in economic policy, technology policy or fiscal policy, as explored elsewhere in Urban 3.0.
In this paper we can just demonstrate a visual mapping approach, and a matrix assessment approach, with some small examples. These are not any kind of final answer, but rather the start of a new kind of journey.

Notes

1. Both definitions are from the Oxford English Dictionary online version, November 2014.
2. The "5 capitals" include: natural, social, human, manufactured and financial capital. There are loose connections to the six domains used in the "STEEPV" scheme, the five fields of the UN-Habitat City Prosperity Index, and many other systems.

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