Extelligence: a new angle on sustainability?

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ABSTRACT

Florida's *Rise of the creative class* (2002) seemingly offers city officials a formula to assure their city's economic prosperity. Some strong correlations between several, at first sight, unrelated phenomena –technology, talent and tolerance– have inspired Florida to declare that we are witnesses to the dawn of the creative society. The people at the forefront of this new society are collectively termed 'creative class' and they are particularly demanding of 'over-all urban quality of life' when choosing a place to live. This society's economy is bent on continuous innovation. That offers a paradox: the creative class that is at the very heart of creativity/innovation –thereby sometimes inducing taxing societal and environmental changes– also demands a sustainable urban environment.

We start from extelligence, which is both the sum of all the forms of human capital - present and past - and the capability to presently or in the future add to it or change it. We define emergence as the phenomenon whereby a system apparently transcends anything that can be offered by its components. A city is an ecosystem wherefrom continuous recombinations of meta-capitals (specifically relational, intelligence and identity), transformational capitals (e.g. finance, labour, and knowledge capital) and natural resources emerge. The observable manifestations of each type of meta-capital are socio-cultural events: the presentation and execution of an urban ideology, the drafting of SWOT-analyses by a city's civil service, and the functioning of its civic community. Sustainable urban development is about creating a path that avoids wasting mankind's capital bases (i.e. all forms of extelligence and natural resources).

We formulate, through an abstraction of the dynamic interplay of extelligence, socio-cultural structures, generative mechanisms and socio-cultural (incl. economic) events, a systemic approach of urban economic growth. This theoretical approach will be verified through case studies; the presently selected cities being Amsterdam and Antwerp.

Key words: extelligence, meta-capitals, socio-cultural structures, creative society, emergence

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1. INTRODUCTION

Recent literature on sustainability and sustainable development acknowledges that these are part of a larger set of problems (Buck, Gordon, Harding & Turok, 2005; Fainstein 2005; Talen 2006). Questions of social equity, local diversity, economic growth and sustainability are interdependent and require a larger framework to address their resolution. The following quote is an introductory comment by Fainstein on the impact of the modern-day economy on cities:

> Whereas once the city developed organically primarily in response to local forces, now all cities are caught within the web of global exchange and display similarities resulting from impulses within the global economy and development strategies that are widely shared (p. 6).

This suggests that macro-tendencies such as globalisation and economic strategy formulation are equalising forces for cities all-over the globe while local particularities are seemingly reduced to irrelevance. It will be argued in this paper that such a call may be unwarranted in view of a better understanding of what binds humans and their urban settlements.
The next section aims to show that questions of creativity/innovation (i.e. economic growth) and sustainability are grounded in the selfsame social structures. To clarify this position section 3 will deal with extelligence and emergence. In section 4 meta-capitals –a component group of extelligence– and their roles in sustainable urban development are explored. Any abstraction requires verification. For this purpose Antwerp and Amsterdam have been selected for future study in section 5. Finally, some tentative conclusions are presented.

2. APPROACHING SUSTAINABILITY FROM A CREATIVE ANGLE

While commenting the increasing drive for innovation in a globalizing economy and the ensuing pressure on the USA to retain its position as a superpower, Florida (2005) points out the importance of its creative ecosystem –a densely interwoven fabric of institutions, individuals, and economic and social rights. As with any ecosystem perturbations –whether internally produced or externally inflicted– can result in debilitating damages to that system. One of its basic components is the presence of talented people, of which Florida observes that the USA no longer attract sufficient numbers from the rest of the world to retain its economic dominance.
Human ecology is the scientific field concerned with the study of the relationships between people and their natural and social environments. An enduring characteristic of the relationship between humanity and the natural ecosystem has been one of exploitation of the latter by the former. Moreover, enduring human relationships –i.e. continuously reproduced practices by one or more generations of people– have produce another type of ecosystem, called society. The verb ‘to sustain’ has several meanings: to maintain, to support but also to suffer. Clearly, Florida’s comments are, firstly, indicative of a particular social ecosystem that is suffering from a shortfall in one of its components, thus potentially threatening its continued existence and, secondly, therefore implicitly enquiring into how that system should be supported. Furthermore, this problem is compounded by questions concerning the sustainable use of natural resources. Awareness is rapidly growing that the fruits of modern-day life are apparently the result of a straight-forward unilateral trade-off between two ecosystems; namely society and nature.

Florida's attention for a creative society stems from an earlier research question, namely what assures or denies a city's economic prosperity? Boldly claiming that the liberation of human creativity and the ensuing race for innovation in the economic system have fundamentally changed society, he has put the creative class at the forefront of the knowledge-driven economy (2002, 2004). In his findings, cities' economic growth patterns strongly correlate with creativity, which is measured through the presence of a high-tech economy; a talented workforce and a generally tolerant populace. Consequently, the attraction and retention of creative professionals has become one of the main concerns of many city officials. It is something of a paradox, from those same findings, that the members of this creative class –who sometimes induce through the nature of their professional activities taxing societal and environmental changes– long for a sustainable urban environment that offers a variety of cultural and infrastructural amenities; a high quality of life; and a *milieu* where their profession can be conducted successfully. Cities –being within nature spatially embedded social ecosystems– have been at the centre of questions concerning the environmental sustainability of the globalizing economy in general and of the Western life style in particular. The observation that a specific group of human agents is susceptible to choosing one city over another because of its perceived sustenance –i.e. the condition of being sustained– not so much adds a new twist but rather reveals a far sharper angel to the problem of sustainable urban development. Sustenance –as an outcome in the present– offers a potentially competitive edge while at the same time sustainable development –as a process resulting in a series of future outcomes– is continuously threatened by the side-effects and feedback loops of the economic and migrational fluxes.

It can be safely assumed that cities are typified by qualitatively different characteristics and processes (e.g. local culture) although these human constructs also share common traits (e.g. the macdonaldisation of the shopping streets)[1]. Therefore, there is no general answer to the question of how to assure an urban settlement's sustainability. Developing strategies for sustainable urban development requires a firm understanding of these qualitative traits. In his seminal book, *Cities in civilization*, Hall (1999) observes that the presence of digital communication infrastructure is singularly important to the future of the 21st century city. He suggests that technical and cultural creativity go hand in hand and will reinforce the human need for urban proximity. In his opinion this is evident in the examples of, on the one hand, a city like London that has attracted multi-media businesses due to its long established artistic centres and, on the other hand, the increasing need for face-to-face interaction alongside the multiplying Internet connections. Both communication infrastructure and social interaction patterns are manifestations of different forms of human capital: the former is of a transformational nature while the latter is a meta-capital[2]. The differences in human capital types and structures are fundamental to a qualitatively oriented understanding of each city. We concur with Barry (1996) that sustainability refers to the whole of societal-natural relationships, both material and immaterial, which should be distinguished from sustainable development that specifically applies to constantly productive economic-ecological exchanges in terms of non-deteriorating capital bases. For the purpose of

[1] F.A. von Hayek wrote in his Individualism and Economic Order (1949) that every economic phenomenon needs to be interpreted in its proper context, i.e. the 'particular circumstances of time and place'. As G. J. Hospers (2005, literal translation from the Dutch original) puts it:

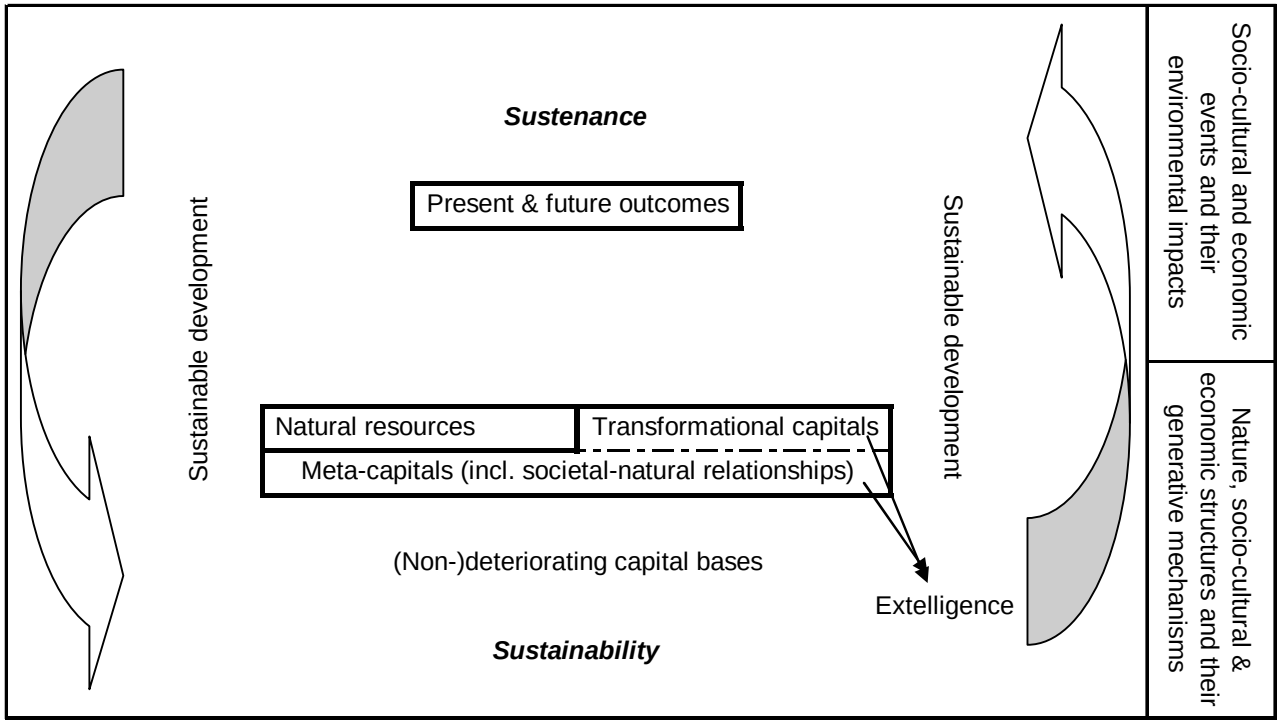
> " Every city is historically unique and can never be held as a model for any other city: it is impossible to transpose historical examples to the present-day context. " (p. 395)

This is no less true for other than economic processes.

[2] The difference between transformational and meta-capitals is a subject of section 3.

this paper, however, it is posited that the societal-natural relationships are in effect a part of the capital bases, specifically the meta-capitals.
Figure 1 clarifies this position. Natural and human-based structures continuously produce events, all of which have an environmental impact. Those structures are represented by capital bases: natural resources, transformational and meta-capitals. The search for the identification of sustainable development paths aims to attain the continued sustenance of daily life (preferably as we know it or even better) and to ensure the sustainability of the underlying capital bases. The latter aim refers to the fact that there is a feedback loop whereby the use of capitals produces certain events, some of which will in their turn inevitably impact upon the capital bases (e.g. the deterioration of air quality through traffic jams due to increased motorisation, which is in itself the result of the extant economic structures).

Figure 1: Inputs, throughput processes and outputs within interdependent ecosystems



Source: Adaptation from numerous sources by the author

Both natural resources and human-based capitals are at the basis of the daily events that we can observe. The outcomes generated through human agency can either lead or not lead to a state of factual sustenance. The qualification of 'sustainable development' holds if and only if those generated events do not result in the deterioration of the underlying capital bases. Deterioration can be measured in terms of intergenerational solidarity: do we pass on natural and societal environments in which future generations will be able to meet their needs[3]? The totality of capital bases is a means but its non-deteriorating nature is also an end all of its own.

[3] In 1987, the World Commission on Environment and Development (WCED), which had been set up in 1983 by the UN, published a report entitled «Our common future». The document came to be known as the «Brundtland Report» after the Commission's chairwoman, Gro Harlem Brundtland. It developed guiding principles for sustainable development as it is generally understood today.

The capital bases are the common ground wherein the quests for economic growth (through creativity) and sustainability are grounded[4]. On a daily basis the struggle for sustainability of the natural and social ecosystems is not so much with nature –although events such as volcanic eruptions or tsunami are not banal- but with the aspirations of society and its agents– irrespective of the fact whether the latter are individuals or complex groups of people such as firms. The social ecosystem, which offers us so much, is also the most important source of unsustainability. To better understand this, we need to touch on the phenomena of extelligence and emergence.

3. EXTELLIGENCE AND EMERGENCE

3.1 Extelligence

A quick scan of the Internet with *scholar.google* reveals that extelligence returns only 24 records of which 15 are either conference or full papers, 2 are book reviews of *Figments of reality* (Stewart & Cohen, 1997), 3 are abridgements from other titles and 4 are citations of books or papers treating extelligence[5,6]. An additional search through *books.google* turns up 17 titles of which 3 had already turned up under the previous search. With the exception of the original book reviews and two papers all other records (i.e. books, papers and citations) have been published in or after 2000. After verification all books except one refer for the use of the term extelligence to the original by Stewart *et. al*. This gives ample scope for original interpretations of this idea.
Stewart *et. al.* introduce extelligence as the contextual and cultural analogue of internal, personal intelligence. It is the result of the complicity between language and intelligence: along the evolutionary path of mankind both have been challenged by the other to grow to new heights of achievement. For the time being no other animals are known to have grown a brain that can handle highly complex and abstract notions or to have developed a vast language in which to express those notions. From the interaction between intelligence and language, an ever bigger brain capacity, an ever more intricate language, and foremost extelligence have emerged. The latter is an emergent phenomenon of an ecosystem continuously redesigning itself to allow its inhabitants to become even more intelligent and communicative. Emergence – well established in philosophy, biology, physics and systems theory– is a key concept that roughly equates to the popular idea of the whole being more than the sum of its constituent parts. Along the evolutionary way humans have learned to store information so as not to be obligated to reinvent lessons learned by previous generations. What is more, extelligence itself has evolved: for example from simple and long-told folk tales to the modern-day and highly complex Internet. But, as Stewart *et. al.* note, extelligence is not solely about ways of recording – it is, furthermore, also a source for manipulation by individual intelligence, whereby the latter can change or add to the extant extelligence. Extelligence is therefore the sum of all humanly produced knowledge and of the subsequently derived artefacts that make up mankind's tool kit. Extelligence takes all of its importance from two facts: firstly, individual intelligence is fallible, subject to aging and halted by death, and secondly, it is the tool with which humans train their young ones to become full-fledged members of society and 'masters' of nature. What is more, the invention of writing has propelled extelligence beyond the control of any individual intelligence offering –to all who can intelligibly access it– a boundless set of possibilities for creative behavioural practices and artefactual innovations.

[4] This is no less the case for questions of social equity and diversity.
[5] Per January 3, 2007.
[6] A search of Web of Knowledge per January 25, 2007 yielded nothing.

For the purpose of this paper extelligence is defined both as the sum (or stock) of all the forms of human capital bases – present and past – and as the capability (or process) to presently or in the future add to it or change it. This definition excludes natural resources (see Figure 1). All extelligence has been captured in artefacts and practices. Tangible capitals or artefacts are e.g. urban architecture and productive infrastructures. Examples of intangible artefacts are the notion of financial capital and knowledge. Scrivener (2002) for instance pointedly observes that a society failing to use extelligence risks relegation from the knowledge-driven economies to the ranks of the 'knowledge poor'. Finally, socio-cultural and economic practices are the manifestations of the capacity to generate individual or collective contributions to society and the economy.
The types of capital, identified in the previous paragraph, are of a transformational nature: their use is to transform capitals in other capitals. E.g. knowledge about physics and the presence of natural materials results in buildings or architectural capital. A building that provides office space for product developers and designers or workshops for manufacturers is (in-)directly, instrumentally, involved in further transformational processes. Every transformational process, however, is embedded in a set of meta-capitals.
These meta-capitals relate to the urban environment we're interested in. Through their agent-inhabitants urban settlements provide a space for the production of identity, intelligence and relational meta-capitals (and their subsequent practices). Nature isn't always a pleasant place to stay; nor is society for that matter. Between agents in each small settlement, town, large city or metropolis power positions and congruent relational practices emerge that aim to deal with the challenges offered by the societal and natural environments. Similarly, urban settlements offer a means to reinforce and extend the social identity of its inhabitants and to muster the necessary intelligence to deal with the contingencies of life. The transformational capitals –such as Hall's aforementioned communication infrastructure– are to a high degree quantifiable. Contrastingly, the meta-capitals, exemplified in social interaction patterns, are of far more qualitative nature. It is the latter meta-capital types that we are interested in with regard to sustainable urban development.

It is not so hard to understand why cities such as London, New York, Paris or Los Angeles are attractive to creative professionals. The amount of available transformational capitals is huge. The total economic leverage power increases in more than a proportional manner in response to an increase in transformational capital: especially with the presence of knowledge institutions in a knowledge-driven urban economy. The sheer number of people involved in knowledge production and in translating knowledge into innovative products is indicative of the available extelligence. Of course, historically, people in smaller cities and even hamlets have access to a much larger extelligence basis than ever before thanks to the Internet. These human agents can be just as inspired and creative as any inhabitant of a metropolis. But Hall's observation on the need for face-to-face contacts ensures that the attractiveness of e.g. London has a high degree of resilience.
In contrast, the role of meta-capitals is less than clear-cut. Seemingly, meta-capitals only function in terms of supporting and managing social life: power relations are responsible for providing access to and distributing social goods between the inhabitants; civil intelligence gathering is mostly concerned with the immediate opportunities and threats that an urban settlement faces; and, finally, urban image and identity building aims to maintain social cohesion. When abundant these meta-capitals provide stability for the transformational processes thus making an urban settlement more attractive to its current and potential inhabitants. The significance of meta-capitals is enormous although their outright manifestation is rare. In the cases of September

11th, 2001 in New York or July 7th, 2005 in London the local authorities used their relational capital to call in all kinds of necessary means, mustered the city's own resources in civil intelligence gathering and appealed to the urban identity part of inhabitants' social identity to restore law and order as soon as possible, in order to minimise the disturbance of daily life and to assure the continuance of the local economy. The leverage exerted by transformational capitals has, understandably, a larger impact when meta-capitals provide the proverbial grease for the economy to run on.

Not withstanding, local urban identity, power relations and civil intelligence gathering can get into a phase of lock-in: preserving the *status quo ante* can easily become a priority matter while neglecting the required impetus to ensure the long-term interests of that urban settlement. Structurally in-built or even in-bred characteristics of the local meta-capital stocks could eventually dampen the local economy and will potentially deplete the local natural resources. Metaphorically put: you cannot grease an ecosystem with heavy tar. As an urban economy falls behind in comparison to other cities' economy, the local economy becomes even less attractive and the stocks of local meta-capitals may start to deteriorate through outgoing migrational movements. It is not unthinkable that city officials may well feel pressured into deciding to compensate this fall in attractiveness by allowing agents – both (potential) inhabitants and (potential) companies or organisations – to increasingly exploit the natural environment. Assuming that this is allowed to last for a long time the local capital bases (extelligence and nature) will be further weakened and the continued sustenance of the local community may in the end falter.

The amount of transformational capitals is therefore not the sole explanation for attracting newcomers (especially creative professionals) to and retaining people in a certain urban settlement– so are the nature and amount of its meta-capital stocks and established behavioural patterns. Understanding the composition of local extelligence is crucial to answering the question what sustainability implies for that city and how sustainable urban development should be pursued.

3.2 Emergence

Extelligence has emerged from increasingly complex interactions between human agents, on the one hand, and between humans and their natural environment. Understanding the process of emergence offers a clue to understanding the structure of extelligence.

The natural ecosystem in which we live, Earth, is basically composed of atoms that interact through four forces (gravity, electromagnetism, and weak & strong nuclear forces). There from life has emerged: an ongoing (re-)combination of atoms into proteins, viruses, bacteria, etc. into what we call higher life forms. However, the content of our thoughts is irreducible to the proteins and cells we are made up off. The popular expression for this phenomenon is that the whole is more than the sum of its parts - thus making reference to irreducibility. The increasing brain capacity of man and the congruent development of language have spawned a completely different kind of ecosystem: society. Simple societal forms, such as the family, have emerged from the interactions of a number of agents operating in a natural environment. This has led to collectively producing even more complex behaviours. For the purpose of this paper it is posited that people have emergent powers.

The concept of agency (referring to agents and agential behaviour) stands in contrast to structure which we use to refer to all kinds of social forms (e.g. marriage, clan, nation, etc.). Another characteristic of emergence, besides irreducibility, is that it generates unintended consequences. The law of unintended consequences is not a law in the strict scientific sense, but it is often quoted to encapsulate the idea that

almost all human actions have at least one unintended consequence. In other words, each cause has more than one effect, including unforeseen effects[7]. Structures, such as marriage or clans, offer easily understandable advantages to the participating agents. But they have in their turn led to higher structural phenomena: urban settlements and nations. Additionally, the latter structures have the generative capacity to change the behaviour of all or a part of their constituent elements. Nations e.g. regulate the behaviour of their subjects through all kinds of other structures (i.e. legislative organs, executive organizations and judicial institutions). Another example is how urban settlements enforce both physical and imaginary confines on human agency other than those imposed by nature. Nature hasn't equipped us with the means to fly; so we have invented airplanes. They take flight along air corridors whereof the limits are defined by the presence of urban settlements. Furthermore, within those settlements human behaviour is delimited by the built-up environment and by the symbolic value of buildings (e.g. in a democracy the physical integrity of a person is deemed unassailable but even more so within the walls of a religious building). Thus, we conclude that simple social structures have not only produced more complex ones but, in addition, these are seemingly endowed with the capacity to steer human behaviour. Similarly to people's emergent powers socio-cultural and economic structures are also marked by emergent powers.

In the same way as emergent biological phenomena, extelligence is irreducible to individual agents and is the foremost unforeseen result of the mankind's brain and language capacities. The lessons learned over the course of human evolution have been transferred from one generation to the next. Extelligence, as the whole of those lessons and as a tool for socialization, has itself continuously evolved to allow human agents to become even more intelligent and communicative. The stance of sociologist Pierre Bourdieu is that society is continuously reproduced through the practices of its agents. Parental agents, equipping their offspring with the necessary social tools for survival within a society, contribute to the reproduction of that society wherein their children will eventually launch themselves.

So what are those lessons? In their most basic form they comprise rules to survive in nature: dress up against extreme cold and burning sun light; be wary of stagnant water, certain plants and animals; seek shelter; etc. In their most intricate form they contain e.g. knowledge about the way natural materials can be (industrially) manipulated or they express/impress the need to respect symbolically produced meanings of social life. It is therefore only logical that any deficiency in the composition and distribution of extelligence will be reproduced by the next human generation. Between agents extelligence is unevenly distributed – for example, higher education offers individual agents a faster, better and more comprehensive access to the knowledge part of extant extelligence and teaches agents with which tools extelligence can be further accessed– and its composition is continuously evolving. On a geographical level distributions and compositions are also different.

Today, in the case of the concept of sustainability – and since it has only become a truly recognized problem in the latter half of 1980's– sustainability and sustainable development aren't part of the means and goals of many human agents because these weren't part of their prior socialization process. Luckily, socialization is not solely dependent upon parents (i.e. primary socialization). Educational programs can remedy those deficits although parental indifference or even opposition (e.g. of conservative parents to the theory of evolution) can effectively counteract those secondary socialization processes. A recent illustration of tertiary socialisation is the BBC's "low

[7] This is why much science is conducted under laboratory conditions: in order to control as many variables as possible and to preclude any unforeseen consequences.

carb family"-project aiming to increase awareness about the carbon footprint of households[8]. From socialisation emerge behavioural patterns. The use made of extelligence by certain socio-cultural structures can thus also help to elucidate why certain types of behaviour have emerged. In line with this reasoning, it is not inconceivable that an urban settlement through manifestations of its meta-capitals may expect its future inhabitants (from newly born to immigrants) to adopt locally embedded notions and practices, which should rationally be judged unsustainable. E.g. the overexploitation of the surrounding land and waters may be the result of locally transmitted extelligence.

4. (UN-)SUSTAINABLE META-CAPITALS

4.1 Relational capital

Relational capital is concerned with the quality of interaction between a city's internal significant agents (its power field), as well as between the city and its external significant ones (Carillo, 2006). Let us assume that in the externally oriented relationship 'city–national government' the latter party is strongly concerned about local sustainability and sustainable development. Thus national government agencies will duly signal city officials that such is the case and will require the local power field to act upon these concerns. The nature and the history of local or internal relational capital will inevitably influence the translation of those governmental concerns. Internal relational capital is partly informed by the interpretations of previous generations of questions concerning social fabric (cohesion, exclusion and diversity), urban economic competitiveness and local governance. Similar to any other social structure the power field subjects its newcomers to a socialization process that mainly aims at reproducing the extant power field. Thus, the established interaction patterns between local political and entrepreneurial power players (in e.g. industrial or housing markets) may in the past have taken on a pervasive nature, which will not easily show when locally defined problems of future sustainability are addressed. Of course, extant relational capital isn't nearly all of the time insidious, indeed on the contrary. The way the power field views local capital bases could e.g. be structurally distorted by historical inheritances: industrial brownfields that lie unused because of pollution, huge urban debt burdens or warping inequalities between adjacent neighbourhoods. In these cases, the urban renewal requires a national effort or trigger. However, as we will see in the case of Amsterdam, it is still up to the local power field to fulfil its urban ambitions and destiny.

From a comparison of the findings of Sohmer and Lang (2001) and his own findings on creativity, Florida concludes that phenomena such as downtown revitalization are strongly associated with the lifestyle factors that appeal to the creative class. Urban scenes offering an eclectic supply of experiences are especially highly valued. In contrast, Robertson (1998) found that in the case of Glasgow housing investment – although making a valuable contribution– there was a clear limit to the spin-offs which accrued from so-called housing-led regeneration. Employment considerations were deemed to be far more vital for the future regeneration of Glasgow. Robertson concluded that planning has to be about strategic thinking and that therefore, critically, Glasgow's economic and housing aspirations should be considered together, rather than separately, as had been the practice in the past.
The problem with eclectic scenes is that the payment structure of small-time artists and service sector employees (e.g. waiters in restaurants) is not conducive to sustaining costly downtown regeneration projects. Highly paid members of the creative class could

[8] http://news.bbc.co.uk/2/hi/programmes/breakfast/6252211.stm

do so but, mostly, will only follow in if the downtown project has already spawned a budding eclectic scene. Balancing downtown revitalization, overall job creation and retention of lesser paid creative and service class members requires leadership from within the power field. This should be observable in the presence of a publicly supported urban ideology which, on the one hand, should generate understanding, collaboration and inclusiveness, while, on the other hand, pragmatically steering and shaping agential behaviour (Sweeting *et al.*, 2004). Defining such a strategy or urban ideology[9], however, doesn't happen on clean slate. Both local history and the socialization or initiation processes into the power field come prior to the formulation of an urban ideology by that selfsame power field; thus potentially thwarting the implementation of a sustainable development path. The future is path-dependent upon the outcomes of past and present power structures.

4.2 Intelligence capital

Given the dependence upon the past, the extant power field and the need for the formulation of an all-mobilising urban ideology, a great deal of intelligence –whereof minds and information are the most important manifestations – is required. The late 19th–early 20th century American philosophical movement, called Pragmatism, aimed at transcending the polarization between "objectivism" and "subjectivism" in the human sciences. It currently enjoys a remarkable revival and one of its early proponents John Dewey (1859-1952) benefits from this renewed interest. In public affairs Dewey believed in the exercise of critical intelligence i.e. the individual capacity to reflect upon the community. He thus chose to reject the reliance upon "experts" although he did not oppose a role for experts (for that would belie the value of critical intelligence and science), but his support was firmly on the side of direct democracy. Dewey adopted a position that Ansell (2002) calls 'the democratization of reason: this position entailed the cultivation of the intellectual and moral capacities of a democratic "public" and hence the treatment of democracy as a culture'.
In view of the complexity of modern-day life, all human agents would have to be equipped with tremendous mind or brain power and, additionally, to be extremely well-informed in order to tackle the problem of sustainability through democratic decision-making. Man has not evolved in such a manner for the simple reason that the required investment –building a huge and even more complex brain- can not be offset by the potential benefits because of long periods of under-use while the disadvantages are important[10]. Of course, the life challenges – from primitive survival to complex questions of sustainable development– are no less real. The human evolutionary answer has been the congruent emergence of extelligence and society. Presently, democracy is in many countries seen as a definitively acquired cultural phenomenon – as Dewey would have wanted it. In contrast, his call for the cultivation of superior intellectual and moral capacities hasn't materialised –nor will it in any nearby future– thus frustrating the outright successful resolution through democratic reason of complex problems such as sustainability. There are just too many conflicting agendas involved.

For all the above reasons intelligence capital –manifest in expert minds and in highly detailed information– is part and parcel of the solution of sustainable development problems. Carillo (2006) defines urban intelligence as the quality of a city's system to sense, make sense of, and respond to agents and events which are significant to the

[9] The body of ideas reflecting the social needs and aspirations of an individual, group, class, or culture. (source: http://www.thefreedictionary.com/ideology)
[10] No other animals are born with a head/body size ratio comparable to humans. In contrast to humans, most mammals are born head last because, in fact, their head doesn't represent much of a birth problem.

city's welfare. An analysis of all the inputs, throughput and outputs of urban life should reveal the strengths, weaknesses, opportunities and threats (commonly abbreviated to SWOT) involved with the sustainability of all capital bases. Ideally an urban civil service should extend this analysis to the furthest boundaries of the so-called environmental footprint of its urban settlement. Doughty *et al.* (2003) have found that the footprint of Bath (UK) is greater than its surrounding bio-region and some 20 times larger than its own land area. It is not difficult to visualise that urban footprints are geographically overlapping in many Western countries thus illustrating the potential depletion of all capital bases. Any formulation of an urban ideology should consequently be informed by such SWOT-analyses. The subsequent adoption of an urban ideology is only acceptable to the whole of society if and only if intelligence capital can provide sufficient indications that a reduction of the environmental footprint and a smaller rate of deterioration of the capital bases will be attained. Hence it is problematic if the intelligence gathering and processing capacity has been structured by previous generations in a manner which is not appropriate for the present-day challenges. A poor intelligence capacity will not be able to provide the required sophisticated information nor will it be able to make the necessary judgements on the evolution of all capital bases. Previous failures to define sustainable development paths for specific urban settlements can undoubtedly in part be attributed to the structure and congruent interaction patterns of this meta-capital.

4.3 Identity capital

Whereas relational capital is concerned with the local power field and urban ideology, and intelligence capital is about making the urban reality intelligible and proposing a sustainable development path, we now turn to identity capital. Buck (2005) introduces social capital as resources which are obtained through membership of social networks. However, membership of social networks, including e.g. the family, provides human agents with more than just resources. Social structures offer agents chances to acquire a social identity. Inevitably this means the introduction of historical and informal elements which shape the experiences of what it is that makes an agent a member of society and give form to the aspirations of an agent. The interactions between agents – i.e. between social identities, thus between sets of social origin, experiences and aspirations– within the framework of an urban settlement result in the emergence of a local identity. Allegiance to local or urban identities is observable for instance in sports or in favouritism of localities in national politics. For the purpose of this paper it is posited that the concept of identity capital is richer than social capital. The latter is –as Buck observes– 'an *economistic formalization* of the sociological observations on involvement within social groupings'.

Previous to but even more since the Industrial Revolution, urban identity capital has been shaped by the sources of economic growth. From small fishing ports to the location of naval bases, from agricultural settings to mining sites, from trading posts to bustling airports – all adjacent and surrounding urban settlements have seen their local identity fashioned by a number of generations whose livelihoods depended upon the industrial demand for labour. Local identity is about shared bundles of values, expectations and goals. Modes of thought steeped in local identity can burden a city with interaction patterns that are incompatible with sustainable development. What's more, these patterns will most likely turn out to be highly resilient to change. Congruent with identity capital, the structuring of relational capital can be expected, if not completely then partially, to coincide. From fox hunting to the geographical immobility of the unemployed in post-industrial cities, many behavioural patterns can be attributed to local identity capital.

Florida has found that for the creative class the perceived tolerance of a city's population is a notable explanatory factor for its urban attractiveness. In a similar vein, tolerance is likely to be a factor of clarification for local resistance to changing towards sustainable behavioural patterns. A local identity that gives primacy to one value or goal –e.g. homogeneity or continued natural exploitation – over a set of balanced values –e.g. including diversity or preservation of nature – can not meet the goal of a just city. A further twist to this line of argumentation lies in the potentially detrimental effects of attractiveness. The attractiveness of a city to creative professionals – explained by the presence of high-tech industries, other talented people and a generally tolerant population– can lead to phenomena such as gentrification. In the long term this can undermine the sustainability of that city and its economy through increased social polarisation and economic exclusion (Butler, 2004 & 2006). An urban settlement that succeeds in formulating and executing a sustainable development path could become a coveted target for habitation in the eyes of residents of less successful settlements. As with gentrification, an influx of outsiders with similar agendas and backgrounds can without doubt disturb the local equilibrium and its subsequent development. Local identity capital could easily be pressured to change into something far less sustainable. Both failure and success –irrespective of whether the aim is attractiveness or sustainability- create a feedback loop which will influence the further development of the urban settlement and its local patterns of extelligence.

5. AMSTERDAM AND ANTWERP

The growth path of a particular city's economy more often than not differs from that of other cities. Local natural endowments and other such objectively measurable features can partly explain these differences. However, dynamic and innovative human practices, especially in Western cities, play an evermore important role in the creation of local wealth (Florida 2002, 2004, 2005), We take these findings to be indicative of socio-cultural structures wherein practices of innovation are embedded. The same could be argued for social equity and local diversity. Any attempt at manipulating these structures –specifically the meta-capital bases– through social engineering requires a thorough understanding. Cities are open systems, i.e. they are mutable under pressure from processes that take place both within its confines and outside its boundaries. Implementing urban policies –solely based on general economic findings – while neglecting the nature and history of a city's deeper socio-cultural structures could, due to the complexity and interdependent nature of economic competitiveness and social coherence, just as well dampen down as stimulate local growth path and innovative practices.
Moreover, the same meta-capital bases are involved in questions pertaining to sustainability. Relational capital (of which the aggregate is a power field), intelligence capital (organized in an urban civil service and maybe assisted by (local) academic quarters) and identity capital (represented by all kinds of tangible and intangible civic resources) are the proverbial grease for the successful implementation of a knowledge-based economy, an equitable and diverse city and a sustainable society. The observable manifestations of each type of meta-capital are socio-cultural events: the presentation and execution of an urban ideology, the formulating of SWOT-analyses by an urban civil service, and the functioning of its civic community.

A common approach to understanding the reasons for and effects of innovation on economic growth is the theory suggested by Joseph Schumpeter (1939). Reinterpreting the findings of Nicolai Kondratieff on long economic cycles within capitalism through the observation that the establishment of new industries coincides with these cycles,

Schumpeter concluded that innovations triggered these cycles both on the micro (or firm-based) and the macro-level of the economy. Cities are *milieux* where practices - both old habits and new routines- can be observed and where innovative products are introduced. They are the social and physical environment whereupon creative agency and innovations have a great impact. Cities endowed with specific amounts of meta-capitals will enable or constrain creative agency. Similarly these local meta-capitals will facilitate or hamper the reorientation of the local approach to economic growth towards a sustainable development path. A promising approach to understanding the history of local meta-capitals lies in comparing the documented instances of change in meta-capitals with the known fluctuations in the economic cycles. It is hypothesized that, prior to the process of spawning new industries in certain cities, the local capital structure (consisting of natural, transformational and meta-capitals) must have been either conducive or at least not averse to that process.

Through the instrumental cases of Antwerp and Amsterdam further research aims to demonstrate that their respective patterns of (un-)sustainable growth and the degree of economic innovativeness result from (dis-)similarities in the socio-cultural embedded nature of creative practices[11].

Antwerp and Amsterdam are closely related cities. Between 1480 and 1585 Antwerp was the premier merchant city of Europe. The economy of Antwerp went into decline due to the war between the Dutch Republic and the Kingdom of Spain. Amsterdam picked up this role of premier commercial town of Northern Europe –and along the way a large part of Antwerp's merchant class– until London became predominant in the 1660's. The divide between the Southern and Northern Netherlands was only overcome shortly when The Low Countries were politically reunified between 1815 and 1830. There is little controversy though in the observation that Antwerp and Amsterdam grew culturally apart after the Spanish war efforts of the late 16th century.

In the wake of WWII, the American Marshall plan shaped the economies of Belgium and the Netherlands. Both countries had at their disposal a number of colonies. Large cities such as Antwerp and Amsterdam saw the colonial natural resources pass through their harbours. In addition, both had and still have strong social and cultural scenes (for instance, their art academies). Undoubtedly, in cities such as Antwerp and Amsterdam, (dis)similarities have developed that make sense only under local extant conditions. Differential rates of (sustainable) growth and innovation, and the different approaches to and appreciation of sustainability are all expressions of divergences in practices that exist only by the grace of dissimilarities in the underlying meta-capitals.

One example in Amsterdam of the impact of the local power field and civil service is how administrators allocate housing funds to avoid homogenisation of neighbourhoods and the subsequent isolation of different ethnic groups and income classes. Fainstein (2005) writes:

> When we analyze the factors that produce Amsterdam, we can identify a path dependence that implies that other places, not having enjoyed a golden age in the seventeenth century and a long tradition of intelligence governance, would have difficulty in imitating Amsterdam's model. Nevertheless, much of that city's success results from post-war planning that did consciously commit itself to the values set forth above. When it did not, as in the 1980's efforts to carry out wholesale urban renewal in its nineteenth century ring, fierce opposition stopped the government's program.
>
> […]
>
> Some might doubt that Amsterdam presents a case of urban regeneration, instead seeing it as always prosperous. In fact, not so long ago the Dutch economy was in trouble, Amsterdam was afflicted with high levels of crime and vandalism; and people and industry were leaving the city. The reversal required a national policy framework that

[11] In 2006 a grant was obtained to research this question. Baring any further hurdles this project should start by February or March 1st.

> supported the values of growth, equity and sustainability. Within that framework the municipal regime could plan to maintain diversity within an open, participatory system of governance (p. 15).

In these two paragraphs we find the following items: the city's attractiveness (reminiscent of R. Florida's discourse); a national government concerned about growth, equity and sustainability; the municipal regime's role (combining power field and civil service) and the urban identity's defence of its urban architectural texture.

6. CONCLUSION

A society that craves novel experiences, innovative products and creative practices represents a new dimension to the problem of sustainability. Reasons to make this claim have been found in the common ground for creativity and sustainability, namely the emergent phenomenon called extelligence whereof the transformational and meta-capitals are the constituent parts. Extelligence has emerged from the interplay between our brain power and language faculty. Extelligence is not only defined as the sum (or stock) of all the forms of human capital - present and past – but also as the capability (or process) to presently or in the future add to it or change it. All meta-capitals – relational, intelligence and identity– are required in order to support the transformational processes. These meta-capitals should enjoy the same protection against deterioration as transformational (e.g. knowledge) and natural capitals. However, those meta-capitals not only enable but can also constrain other processes, including the design of an urban ideology on sustainable development, the data gathering and comprehensive analysis of intelligence on urban sustainability and, finally, the adoption into the urban identity of sustainable behavioural patterns. The constraining capacity of meta-capitals is in-build because the processes of socialization of human agents into the field of power, the civil service and the civil community are, on the one hand, based on incomplete information and historical contingencies and, on the other hand, performed by human agents whose intellectual and moral capacities are limited, fallible and subject to aging and death. This in no way means to degrade the successes of mankind. Those important achievements are, of course, a testimony to the emergence of extelligence and of the interactions between the latter and a lot of individual intelligences. Nevertheless, it should be noted that a manifold of these successes have come at an important price: the increasing deterioration and depletion of natural resources. Eventually, this process of deterioration could threaten the very meta-capitals and transformational capitals that make up extelligence. In that case, extelligence could turn out to have been a self-defeating capacity that emerged from a species that wasn't sufficiently endowed to understand what it was doing. Contrastingly, this crucial lesson could be made a part of extelligence thus ensuring its potential sustainability and the sustainable use of natural resources.

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