and working environments as friendly and able to stop them from becoming a burden which merely ends up as a pattern of settlement doing little more than reproducing yet another form of resource intensive consumption. Yet another form of resource intensive consumption in a pattern of settlement which it should be noted, for all intents and purposes, still runs the considerable risk of being far from sustainable, not only in terms of the urban villages and neighbourhoods set out as model designs, but the communities this in turn develops.

The paper has ended by suggesting that if such an outcome is something which is thought best to avoid, it will be necessary to begin by subjecting the land market to nothing less than an ecological modernisation that leads to a restructuring of planning gain around environmental standards, efficiency measures and financial criteria which allow the settlement models put forward to be designed in such a way as to make it possible for the solution advanced to break the link between growth and consumption and conserve resources through a process of de-materialisation.

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Chapter 7

Valuation, Investment Appraisal, Discounting, Obsolescence and Depreciation: their Impact on the Urban Environment

Introduction

Focusing on the utility of property market valuation and investment appraisal, the following examines the critique of the discounting principle advanced by environmentalists. In particular, it examines the argument put forward regarding the link between the valuation and appraisal of investments, selection of a discount rate, existence of land use, building obsolescence and depreciation connected with the inter-generational downloading of costs. The link, seen by some, as having an adverse effect on the life cycle of land and buildings and as working against attempts to assess the impact experimental designs, aimed at energy saving, low carbon based emissions, have upon the environments in cities. Having examined the arguments, it goes on to rehabilitate the discounting mechanism by incorporating the market criteria of valuation and investment appraisal into the biophysics and ecology of life cycle analysis and environmental impact assessment.

The paper begins by examining the valuation and appraisal issue surrounding the discounting principle, reviews the life cycle and environmental impact assessment measures it is supposed to work against, even frustrate and exposes some of the contradictions in the position the critics set out. Having done this, it goes on to examine the sustainability requirement the (re)development of land uses and building programmes need to meet if they are to be environmentally-friendly and green in the manner they deal with obsolescence and depreciation. It shall then go on to show how the rejection of simple adjustments to the discount rate can be used to rehabilitate the mechanism into a co-evolutionary and multi-criteria approach to environmental economics. The paper will then go on to show how this rehabilitation of the discounting mechanism into such a form of environmental economics can produce a framework of analysis that has the potential to circumvent many of the criticisms about the utility of market based valuation and appraisal models.

By rejecting any 'simple adjustments' and producing a framework of analysis for a co-evolutionary and multi-criteria approach to valuation and investment

appraisal, the paper illustrates how it is possible to circumvent the criticisms that the discounting mechanism has previously attracted and bridge the gap which has opened up between the property market and environmental economics of the, design and engineering of the construction sector. The paper shall propose this rehabilitation of the discounting principle into the mainstream of environmental economics is important, as criticisms of it by environmentalists have resulted in a gap opening up between the property markets underlying the (re)development of land uses, design, engineering and construction of building programmes incorporating the bio-physical and ecology components of energy conservation.

Time horizons, the spatial configuration and rate of redevelopment

In reference to the discounting principle, Harvey (1989: 97) points out that:

> In general terms (re)development takes place when the present value of the existing flow of future net returns from the existing use of land resources becomes less than the capital value of the cleared site.
>
> We have therefore to calculate the present value of the land resources in their current use and compare this with the value of the cleared site, it must be emphasised that we are seeking to establish *capital net* return expected to be earned in future years, such returns must first be estimated and discounted for the present value and then aggregated.

From this initial statement on the discounting principle, Harvey (1989) formulates a simple income model of property valuation. In this model it is the notion of net annual returns, or what he refers to as NARs that take a leading role in the appraisal of investments and rate of (re)development in the time horizons and spatial configuration of land uses and building programmes (see also, Balchin, Bull and Kieve, 1995). As a form of income, the NAR is defined as the difference between gross annual returns (such as rent received) and operating costs (including repairs, maintenance, insurance and other such outgoings). To operationalise the notion of net income as an annual return in terms of property valuation and investment appraisal, he proposes that all gross annual returns and operating costs should be projected over the life-time of the land use, or building programme in question. Before subjecting the NARs to a rate of discount, he makes some comments on the nature of the relationship between the gross annual returns and operating costs. What he proposes is that over the life of the land use the gross annual return (GAR) will fall and operating costs will rise. He represents this notion as an annual return given by:

$$P = \sum_{t=i}^{n} \frac{R_i - O_i}{(1+r)^i} \quad \text{.....(1)}$$

Where:

P = value of property in its current land use

n = period when GARs can be earned in its current use
Ri = GARs from i to year n
Oi = operating costs, excluding obsolescence and depreciation, from i to year n
r = rate of discount

It is a formula which represents the valuation of property as a method of investment appraisal and procedure that should be followed in the discounting of returns and calculation of present value. In terms of cleared site value, it is proposed that the value of the cleared site is equal to the present value of the most profitable alternative use, less the cost of clearing the site and rebuilding for the new use. The residual method of property valuation and procedure to be followed in the appraisal of investments required for this calculation is represented in the formula:

$$C = \sum_{t=i}^{n} \frac{R_i' - O_i'}{(1+r)^i} - D - B \quad \text{.....(2)}$$

Where:

C = the value of the cleared site
n = period when GARs can be earned until alternative use
Ri = GARs from i to year n
Oi = operating costs, excluding obsolescence and depreciation, from i to year n
r = rate of discount
D = the cost of demolition and clearing the site
B = the cost of rebuilding to the new, alternative land use

The dynamics of the NAR model

Taking the NAR model to represent the dynamics of (re)development, it is possible to illustrate the process of change within the time-horizon of land-uses and spatial configuration of building programmes (see Figure 7.1). As Figure 7.1 illustrates, from year R the value of the cleared site is positive and increasing and eventually at T it is seen to exceed the present value of the land in its current use. As a result redevelopment takes place in year T, where PV equals VCS.

As Harvey (1989) is keen to point out, at T the land use is still technically efficient, for it can receive a NAR until year Z. However, in year T it becomes inefficient in economic terms because resources can be redeployed, or switched to an alternative, new land use having a higher present value. As he points out, under these circumstances the present value of the current and cleared site bring about a situation where the time-horizon of a land use is represented as OT and position whereby it is possible to calculate how many years the technical and economic life of a building programme is efficient,

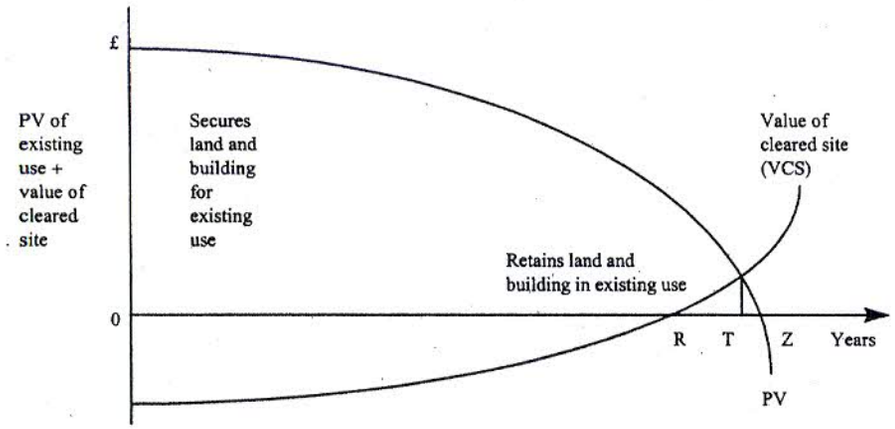


Figure 7.1 The Timing of Re-development

Under normal circumstances the spatial configuration of land uses are found to be concentrated in the city centre and that any alternative, new use which follows from a programme of building takes the form of an expansion from the centre to the periphery (Harvey, 1989, 1996).

With regards to the rate of redevelopment, it is stressed this is far more difficult to predict and is contingent on a number of factors. First the level of demand from occupiers and investors; second: operating costs and thirdly: the rate of interest. Ignoring the first two categories, he goes on to examine the effect a change in the rate of interest has on the present value of current land uses, cleared sites, time-horizon and spatial configuration of building programmes.

Land use, building obsolescence and depreciation

Perhaps the most obvious and immediate significance of this examination is that it introduces a variable not yet taken into account in the NAR model of property valuation and investment appraisal i.e. obsolescence and depreciation. However it should be recognised that the significance of obsolescence is much deeper than the addition of further expenditures on the cost of outgoings associated with land use and building programmes. This is because it represents the outcome of a much deeper enquiry into the adoption of discount rates, the so-called initial yield and nature of uncertainty and risk in property valuation and investment appraisal. As an approach to the valuation of property and appraisal of investment, the income thesis draws upon Fisher's (1965) representation of the discounting principle and interest payments the investment of capital yields in terms of a 'rate of return'. Such payments are seen to represent a return for: (a) the loss of liquidity; the payment for the foregoing of immediate consumption and switching of capital into investment. A payment also referred to as the 'risk free rate' because it represents the payment for the forgoing of consumption -- investment of capital in riskless operations unaffected by inflation; (c) anticipated inflation and compensation for the loss of real value; (d) the premium which reflects the degree of risk associated with a particular investment opportunity.

Based on this Fisher's (1965) theory of interest, the rate of return is represented as:

$$R = l + i + p$$

Where:

l = Loss of liquidity
i = anticipated inflation
p = the risk premium.

Given the valuation of property and appraisal of investment does not allow for real rates of return, only notional, it is proposed there is no requirement for i and R can be represented as the sum of l + p. Responding to Gordon (1982) and adding in rental growth to the equation, a risk, growth and deprecation explicit model of property valuation as a rational pricing mechanism in the appraisal of investments is put forward (see Baum and Crosby, 1988, 1995). This is represented as follows:

$$K = RFR + r^* - g + d$$

Where:

K = the initial yield on capital investment
RFR = the risk free, inflation prone opportunity cost rate of return
r* = risk premium
g = expected annual rate of rental growth in new land uses and building programmes
d = depreciation in the capital component of land use i.e. the building and not the land. This is because land is seen to represent the non-reproducible resource that commands a scarcity value and transfer earnings payment from (re)development potential. This can, of course, be severely restricted if the land in question is subject to contamination and becomes obsolete in the sense it represents an environmental hazard.

Here the risk-free, inflation prone opportunity cost rate of return is taken to be the redemption yield on government securities and the premium is the additional return for investment of capital in property. The proposal for g to represent the expected annual rate of rental growth in new land uses and building programmes is made so as to allow the depreciation component to be measured in terms of the obsolescence a particular use, or programme has been subject to.

The formula is important for two reasons. First, K is equivalent to the r in the NAR model previously referred to. Looked at in this way, r appears to be a far more complex figure than initially thought. It appears, however, to be one it is necessary to live with if the criticisms of the model's silence on such matters as uncertainty, risk, rental growth and depreciation are to be overcome. Secondly, in taking the form of a summation equation (one which takes the first three criticisms into account), it also works within the definitions of physical deterioration, technical, economic and environmental obsolescence, put forward by the RICS, ISVA and Centre for Advanced Land Use Studies (CALUS) to explain the causes of depreciation. Causal factors Baum (1991, 94) is of the opinion are impossible to single out, but can be represented in terms of (a) physical deterioration (b) external appearance (c) internal specification and (d) configuration. Factors which Baum (1991, 94) argues need to be weighted in order of significance so that the impact of low and high flexibility can be analysed in terms of the impact depreciation has on rental values, yields, expenditure and risk.

The debate over life cycle analysis and environmental impact assessment

The previous discussion sought to identify that a number of developments have taken place in property valuation and investment appraisal which circumvent many of the criticisms aimed at the NAR model. In particular the fact that by substituting the r of NAR model in the valuation of property with that of the initial yield (shown by symbol K) in the obsolescence and depreciation sensitive model of investment appraisal, it is possible to be not only risk and growth explicit, but (obsolescence and) depreciation explicit too. Balanced against this, however, is the fact that this reformulation of r in terms of the initial yield has little to say about the time-horizons, spatial configuration of land uses, or building programmes. What is also noticeable is the tendency for both approaches to say little, if anything about whether or not they represent a net benefit or make a contribution to welfare. This question is, of course, looked at briefly under the issue surrounding rate of return over cost. But given neither of the approaches address spill-over effects, or externalities in any way whatsoever, it has to be recognised any claims in this department have to be balanced against the fact the discount rate (in whatever forms of surfaces i.e. the r of the NAR models, the K of the initial yield, or the plain old rate of interest!) are private and in that sense reflect private as opposed to social time preferences regarding the marginal productivity of capital. This is worth reiterating because it is the life cycle analysis issue of time-horizons, spatial configurations, spillovers, externalities and the social dimension of the discounting principle (and the way it ought to influence valuation and investment appraisal) that is of particular concern to those with an interest in environmental impact assessment (for example; Rydin, 1992; Vale, 1993; Brehney, 1993 respectively).

Working within these terms of reference, Rydin (1992:230) has sought to examine the life cycle and environmental impact assessment issues of valuation and investment appraisal in market economies. Quoting Pearce and Turner (1990), it is proposed that:

> the use of discounting downgrades costs to future generations at the expense of benefits to the current generation. Thus the expense of future maintenance will have a relatively smaller impact on the value of an investment compared with current capital expenditure. This form of valuation can inhibit many forms of refurbishment which would enhance energy conservation and undervalue buildings which minimise their environmental impact.

The contradiction, Rydin (1992) seeks to expose is that the economics of discounting in valuation and investment appraisal, tends to work against the possibility of introducing experimental designs aimed at low carbon and fossil fuel content because the benefits they provide in long term, repair, maintenance and running costs do not translate into any additional rental income, or a favourable yield adjustment, but merely additional capital costs. This is seen as contradictory because: (a) the so-called tyranny of the discounting principle tends to militate against the introduction of such experimental designs; (b) it inhibits improvements and refurbishments aimed at low carbon, fossil fuels consumption; (c) it leads to high repair, maintenance and overall running costs without any compensatory income; (d) tends to negate the possibility of offsetting deterioration, obsolescence and depreciation in a manner that brings about long term horizons and more compact spatial configurations; (e) downloads private and social costs associated with land use and building programmes to future generations for the benefit of the current. As a critique of the discounting principle, it draws upon the research of Pearce and Turner (1990). As it is a concern that leads Rydin (1992) to advocate a lower discount rate, initial yield or level of interest for environmentally-friendly, green land use and building programmes, it is a critique which requires further attention.

Pearce and Turner's (1990) criticism of the discounting principle is five-fold: (a) that private individuals can measure the pure time preference for present consumption as opposed to future investments; (b) the lack of consideration given by the marginal efficiency theory of capital to social time preference; (c) the lack of any specific allowance for uncertainty and risk in the choice of the discount rate; (d) the tendency to ignore that a positive, initial yield or rate of interest on capital investment assumes growth; (e) the fact that discount rates have an in-built tendency to place a high value on current income and a low weighting to future capital and revenue costs.

Looked at independently, it is evident that the first four criticisms are economic in nature. What is also clear is that the last point has little to do with efficiency and in referring to such matters as the downloading of inter-generational costs, is a social question to do with equity. Irrespective of this however, what Pearce and Turner (1990: 223) recognise is that:

> The implication of the criticisms is that we should lower discount rates from whatever they are... . If we accept this we have an immediate problem in that the criticisms do not

tell us by how much we should lower discount rates. We are left with an indeterminate theory of discount rate selection.

In an attempt to circumvent this problem, Pearce and Turner (1990) propose that an alternative to the question of adjusting discount rates should be looked at. It is proposed that attention should focus not so much on the adjustment to the discount rate, but on the sustainability requirement valuation and investment appraisal needs to meet in order for it to take account of the effect land use, building obsolescence and depreciation have on the environment of cities. The 'appraisal' , that is to say, which is needed to account for such a situation and lead to a position where life cycle analysis and environmental impact assessment have the time-horizon and spatial configuration needed. The time-horizon and spatial configuration needed for the introduction of experimental designs, aimed at low carbon and fossil fuel content, because the benefits they provide in long term operating costs, repair and maintenance, obsolescence and depreciation, translates into additional rental income and a more sustainable yield.

The contradictions

The paper suggests that there exist a number of contradictions in the environmentalist's critique of the discounting principle which lies behind the valuation and appraisal of investments. The contradictions in question take a number of forms. First factual inaccuracies regarding the discounting principle in property valuation and investment appraisal. Secondly, the tendency to abandon NAR type models of valuation, investment appraisal and their use of efficiency as a measurement of environmental improvement, without any suitable replacement. Thirdly, the tendency to bracket questions of efficiency and environmental improvements within a given distribution of income, in favour of matters concerning the social equity of inter-generational downloading.

Rydin's (1992) criticism of the discounting principle in the valuation of property and appraisal of investments represents it as being at odds with, or working against the possibility of having time-horizons and spatial configurations of land-use and building programmes (as part of a (re)development process) whose effect on the environment of cities is ever going to be as capable of meeting the sustainability requirement. To support this line of reason, Rydin (1992) draws upon the critique of the discounting principle advanced by Pearce and Turner (1990): in particular the criticisms regarding the lack of due consideration given to the marginal efficiency of capital, social time preference, uncertainty, risk and question of growth. What, however, is most noticeable is that Pearce and Turner (1990) do not agree with the arguments put forward to support a discount rate adjustment, but instead focus attention on what they refer to as the sustainability requirement of valuation and investment appraisal. Based on this there can be no simple assumption (as Rydin, 1992 appears to make) that the possible benefits of life cycle analysis and impact assessment for environmentally-friendly, green land uses and building programmes, call for downward adjustments to discount rates,

increase in capital value to offset additional expenditure on longer time-horizons and more compact spatial configurations: something which somehow and in some way, is seen to bring about a situation where the marginal productivity of capital in terms of income return over cost, yields a rate of interest that equates private individual with social time preference for environmentally-friendly, green technologies. However, even putting this to one side, it is evident that Pearce and Turner' s (1990) criticisms do not take into account the significant advances which have been made with regards to valuation and investment appraisal in the contemporary era. For you only have to look at the Fisher inspired formula for the initial yield of Baum (1991) and Baum and MacGregor (1992) to see that in the contemporary era valuation and investment appraisal does take uncertainty and risk into consideration and also acknowledges that growth is another component in the rate of interest (also, see Baum and Crosby, 1988, 1995). Indeed if we follow this line of reason through, it soon becomes clear that any downward adjustment to the rate of discount is based on the assumption the valuation and appraisal of investments will give rise to land uses and building programmes which are not only more efficient, or bring about an environmental improvement, but a level of growth sufficient enough (relative to obsolescence and depreciation) to sustain the yield as a rate of interest on the capital in question. It in fact *assumes a lower level of risk and high rate of growth*, a situation that *tends to draw additional, not fewer, scarce, fixed and finite resources into the (re)development process*. It is perhaps for this reason that Pearce and Turner (1990) draw the conclusion that the criticism of the discounting principle indicates there is something 'a miss' with the rates of return selected, but 'does not add up to much' and choose instead to focus attention on meeting the sustainability requirement.

Meeting the sustainability requirement

As O'Brian, Doig and Clift's (1996) contribution to the debate points out, the 'meeting of the sustainability requirement', is what most of the discussions on the critical role of valuation and investment appraisal have in common. As they also suggest, where these debates differ is in the method each proposes should be adopted for such purposes. As O'Brian, Doig and Clift (1996) also go on to point out, the main reason for rejecting the methodology of valuation and investment appraisal rests in the belief they suffer from the tyranny of the discounting principle, are in that sense too abstract, over-generalised and unhelpful in the way they represent the technical analysis which are needed to measure the effect (re)developments have upon the environment of cities. This understanding is - if a little less explicitly - also reflected in the rejection of market models as the basis of life cycle analysis and environmental impact assessment. The difficulty with this rejection of market-based models is that it is founded upon a incomplete, somewhat questionable critique of the discounting principle and which on reflection adds up to little more than a suggestion the abstract and over-generalised nature of valuation and investment appraisal means it is not possible for a detailed life cycle analysis or environmental impact assessment to meet the sustainability

requirement. If it can be accepted that there are a number of contradictions in the critique of the discounting principle which leave the question of a meaningful relationship between valuation, investment appraisal and the environment open, then it becomes worthwhile searching for a means to bridge the gap that exists between the market basis of the former and more bio-physical cum ecological representations of the latter (Deakin, 1996, 1997c).

The rejection of simple adjustments

The rejection of any simple adjustments to the discount rate and plea to establish whether a development meets the sustainability requirement is also echoed in the work of Norgaard (1984), Perrings (1991), Norgaard and Howarth (1991). Here any notion of simple adjustments to discount rates is discouraged. This is because in principle such a course of action is seen as too mechanistic, unable in that sense to represent either the uncertainty, risk, growth, or knock-on obsolescence and depreciation, resulting from decisions of this kind (see Norgaard and Howarth, 1991 in particular).

Pearce and Turner (1991) and Pearce and Warford (1993), tend to see such concern over the choice of discount rate as too reminiscent of the debates over the valuation and appraisal dimension of cost benefit analysis (see Pearce, 1971, 1972). For Pearce (1990) an investigation of discounting in the context of valuation and appraisal appears to be of little interest (also see, Pearce and Markadya, 1989). Pearce instead turns attention to the valuation and appraisal of what is referred to as natural capital. Built upon a green accounting mechanism, natural capital is put forward as a instrument that captures the fixed, finite nature of those resources critical to the environmental integrity of ecosystems and whose depletion needs to be regulated so that the income stream resulting from the economic development of such resources grows at a rate which is sustainable. Grows, that is, at a rate whereby any factor substitution of natural for man-made capital, or replacement of such resources, does not result in a situation where the development in question brings about an inter-generational downloading of costs (Duborg and Pearce, 1996).

Given the complex nature of the relationship between the environment and economy, uncertainty and incalculable nature of the risk related to decisions about environmental conservation and economic growth, considerations about the choice of discount rate tend to be seen as of little help in the valuation and appraisal of investment. Instead attention turns to the use of non-standard (hedonic and contingency type) valuations (Powell, Pearce and Craighill, 1997) deployment of life cycle analysis and environmental impact assessment in the appraisal process and the effect such instruments can have upon the index of sustainable development (Facheaux, Pearce and Proops, 1996).

In providing a critique of natural capital as a green accounting mechanism, Facheaux and O'Conner (1998), suggest Pearce's 'environmentally-friendly, green' response to the problem of valuation and investment appraisal *merely reframes the question and does not provide a solution* (see, also O'Conner, 1998).

Facheaux and O'Conner (1998) stress the need for what they term non-monetary valuations. Instead of searching for a monetary valuation of natural capital and appraisal of the effect any such development has upon the index of sustainability, Facheaux and O'Conner (1998) put the environment before the economy in what they term a co-evolutionary approach. What they suggest is that the development of both environmental and economic goods/services are complementary, not in the way environmental conservation can sustain economic growth, but quality of life per se. This focus on the quality of life shifts attention to the environment in terms of ecosystem integrity, carrying capacity, degradation, waste, pollution etc. and the scientific basis of any such valuation and appraisal. Here attention turns to energy and the laws of thermo-dynamics in understanding the environment in such non-monetary terms. For Facheaux and O'Conner (1998), energy represents the standard measure of value, as this is the only universal component common to all development, irrespective of environmental context, economic system, appraisal, techniques of analysis, assessment methods etc.

It is the physics of energy that is of particular interest for Facheaux and O'Conner (1998), who seek to apply it in the bio-physical context of ecosystems and given the connection they use for such purposes is both life cycle analysis and environmental impact assessment, it is evident they seek to unite the bio-physical with the social sciences through a particular emphasis on the non-monetary (ecological-based), as opposed to monetary (i.e. market, hedonic and contingency) tradition in the valuation and appraisal of such developments. In casting attention back on energy, eco-systems, life cycle analysis and environmental impact assessment, the point of emphasis shifts away from the economic development of income streams and conservation of resources, to the inter-generational downloading of costs. The reason for this lies in Facheaux and O'Conner (1998) belief that the two discourses (i.e. bio-physical and social) in environmental economics can be reconciled through a multi-criteria analysis which applies the so-called 'hard' certainties of bio-physical science to the more uncertain, risky social relations, 'softer' and by nature more difficult to predict. Rather than represent the moneterisation of income streams in the face of uncertainty and risk as incalculable, due to the inter-generational down loading of costs associated with the hazards of growth, obsolescense and depreciation, what they do is apply the certainties of the non-monetary (bio-physical and ecological-based issues) to assess the impact any (re)development of land uses and building programmes (and economic growth in general) has upon the environment.

What Facheaux and O'Conner (1998) do is rehabilitate concerns over: money, energy, income, costs, uncertainty, risk, growth, obsolescence, depreciation, time and space, into a form of environmental economics that allows (re)development to be assessed in terms of the impact any inter-generational downloading has on the index of sustainable development. This is done by placing emphasis upon the biophysical and social in the co-evolutionary approach to hard and soft issues in the environmental economics of a multi-criteria (monetary and non-monetary) valuation and appraisal of life cycles and impact assessments (see also, Voogd, 1983; Massam, 1988; Nijkamp, Rietveld and Voogd, 1990; Grillenzoni,

Ragazzoni, Bazzani and Canavari, 1997). The significance of this rehabilitation is as follows:

- valuation and investment appraisal is still a major issue in terms of understanding the effects land-use development and building programmes have upon the environment of cities;
- it proposes the valuation and appraisal in question ought to be co-evolutionary in nature, based upon a multi-criteria (monetary and non-monetary) analysis;
- such an analysis should rehabilitate concerns over money, energy, income, costs, uncertainty, risk, growth, obsolescence, depreciation, time and space;
- these concerns should form the basis of an economics that allows any such (re)development of land use and building programmes to be measured in terms of the effect they have on the environment of cities;
- such a from of environmental economics requires both life cycle analysis and environmental impact assessments;
- the concerns over money, energy, income, costs, uncertainty, risk, growth, obsolescence, depreciation, time and space, allow the *discounting mechanism of market valuation and non-standard hedonic and contingency forms of investment appraisal to co-exist and evolve along side the environmental economics of both life cycle analysis and environmental impact assessment*;
- this co-existence and evolution of the discounting mechanism (in the life cycle analysis and impact assessment of environmental economics) provides a means to establish whether the (re)development of land-uses and building programmes, with energy-saving, clean air technologies, is not only environmentally-friendly and green, but meets the sustainability requirement in the way it deals with the intergenerational downloading of costs.

Rehabilitating the discounting mechanism

While the aforementioned goes some way to rehabilitate the discounting mechanism into the valuation and appraisal of environmentally-friendly, green land uses and building programmes, the question about how to do this in the co-evolutionary logic of a multi-criteria approach still remains. The question that remains is whether the form of environmental economics in question should search for some universal standard of value i.e. the consumption of energy in the law of thermo-dynamics for the appraisal of development programmes? That is put the hard certainties of the biophysical and ecological-based issues first and the more uncertain, risky social relations which are 'softer' and by nature more difficult to predict, second. While the co-evolutionary logic of a multi-criteria analysis and assessment does not lay down any rules in this respect, it is possible to see the biophysical dimensions and ecology of energy (non-monetary themes) as *nesting* within the monetary (market, hedonic and contingency type valuation and investment appraisal). If we can accept the co-evolutionary and multi-criteria

approach to valuation and investment appraisal allows this, then the virtues of an NAR-type model become apparent. The virtues in question are as follows:

- it has an implicit bio-physical and ecological dimension shown in the energy factor in the operation and maintenance costs, illustrated in Ri - Oi and represented as the enumerator in formulas (1) and (2). When supplemented with a life cycle analysis and impact assessment, the environmental economics of energy consumption become more explicit and can be represented not only in monetary terms, but its own universal standard of measure;
- a formal time and space dimension is built into the model and its formula for the selection of a discount rate which is risk, growth, obsolescence and depreciation explicit.

The main criticism that may be levelled at the model is the way the formula deals with risk and it in turn relates to obsolescence and depreciation. For what it does is represent risk in terms of systematic and specific market rather than environmental risk. However, as the search for environmental risk (in relation to growth, obsolescence and depreciation) is seen by both Debourg and Pearce (1997) and Facheaux and O'Conner (1998) as impractical without the assistance of life cycle analysis and impact assessments, this omission is perhaps not critical at this stage.

Towards a framework for analysis

So far it has been suggested that the debate over the application in the discounting principle in property valuation and investment appraisal has tended to become separated from issues concerning land use, building obsolescence, depreciation and effect the (re)development process has on the environment of cities. It has also been argued that any attempts to progress the matter should be grounded in the environmental economics of the discounting principle and draw upon what is understood about valuation methodology and investment techniques to advance our knowledge of obsolescence and depreciation via life cycle analysis and environmental impact assessment.

It is for this reason the paper proposes that a framework for analysis should be grounded in a form of environmental economics which provides the opportunity for a detailed examination of meaningful relationships between the dynamics of the time-horizons and spatial configurations of what have been referred to as land use, building obsolescence, depreciation and expenditure on experimental designs, aimed at the introduction of energy-saving, clean air technologies. That is, by undertaking an analysis of how obsolescence and depreciation reacts back on operating costs, repairs, maintenance, improvements etc. Or, from the NAR model's point of view, the relationships between (1 + r) and Oi. The relationship Rydin (1992) is critical of due to its apparent inability to produce land uses and building programmes with operating costs, repair schedules, maintenance

programmes and refurbishments, aimed at low carbon, fossil fuel consumption. The relationship that also appears to be of particular interest to Vale (1993). Accepting that Rydin's (1992) criticisms and call for downward adjustments to r are not supported by Pearce and Turner (1990) and this leaves the whole question of the relationship between valuation, investment appraisal and the environment wide open, it is possible to argue the best way to further any common interest in the debate over the market basis, bio-physical and ecology of both life cycle analysis and environmental impact assessment (and in that sense the sustainability requirement), is through a closer examination of the relationship between Oi and r, the discount rate.

In terms of the NAR notion of net income, it is only possible at this stage to qualify the equation so that r represents K= RFR + r* - g + d. While this will be common for both equations (1) and (2), it will also affect Ri and Oi due to the fact r will be net of obsolescence and depreciation. While the modifications appear minor and perhaps insignificant, it is proposed that their true value lies in the fact the adjusted NAR model addresses many of the criticisms made about the tyranny of the discounting principle and selection of an appropriate rate, draws particular attention to both risk and growth in setting the return on capital *and makes it possible for the rate of interest to evolve from the life cycle analysis and environmental impact assessments undertaken rather than the other way around.* This is an important point, because tackled in this way it is not the market that sets its standards upon the environment, but the life cycle analysis and environmental impact assessment (i.e. environmental economics of the green contingent in the design, engineering and construction sector) whose valuation and appraisal produces the rate of interest acting as a return on capital. The following lists the potential benefits of any such examination:

(a) it would focus attention on the nature of the relationships between Oi and r in the NAR model;
(b) it would build upon the advances of contemporary property valuation and investment appraisals not only in terms of the income approach to risk and growth, but the cost based thesis (Deakin, 1997a, b) on outgoings associated with operating costs and capital expenditure on repairs, maintenance, improvements and refurbishments;
(c) the collection of information on such expenditure would augment our understanding of land-use, building obsolescence and depreciation, by using the criteria set out by Baum (1991, 1994) and Rydin (1992), to establish whether experimental designs of the type in question have notable benefits;
(d) it would also make it possible for the benefits of contemporary valuation and investment appraisal to be formally integrated into the field of development analysis - something it may be difficult to believe has not yet been delivered (Department of the Environment, 1991; Harou, Daly, Goodland, 1994; Deakin, 1996, 1997c; Brooks, Cheshire, Evans and Stabler, 1997);
(e) such data would also allow life cycle exercises to be undertaken in the valuation and appraisal of investments, obsolescence and depreciation and also be capable of incorporating an environmental impact assessment into the (re)development of land-uses and building programmes (Deakin, 1999a, b). This would also allow the market-based criteria of the adjusted NAR-type model to be integrated with the life cycle analysis and environmental impact assessments of BREEAM (see Cole, 1997; Cooper, 1997, 99; Cooper and Curwell, 1998). Here adjusted NAR-type models would provide the market criteria, whereas life cycle analysis and impact assessments like BREEAM, could provide the biophysics and ecology of energy conservation. Nesting within each other, the adjusted NAR-type model would be able to value in line with the market, while the standard for the conservation of energy could be represented in a universal form. The integration of the adjusted NAR-type model with that of life cycle analysis and environmental impact assessment would also add the valuation and investment currently absent from such an analysis or impact assessment (Birtles, 1997; Department of Environment, Transport and the Regions, 1999). This life cycle analysis and environmental impact assessment would provide the information to establish whether the (re)development proposal meets the sustainability requirement. His would be done by benchmarking the impact against a number of indicators to establish what effect the (re)development has on the downloading of costs and index of sustainability associated with such measurements (Mitchell, May and McDonald, 1995; May, Mitchell and Kupiszewska, 1997);
(f) such a schedule of costing would provide information for the valuation and appraisal of the initial capital and subsequent revenue expenditures in terms of outgoings associated with the energy-saving technologies of clean air. The effect of this on occupational demand for land uses and building programmes and demand for property due to its value as an investment opportunity could also be analysed;
(g) the with/without logic of comparative analysis could also be drawn upon to establish not so much the potential, but real effects of introducing such technologies. This would identify what value the market puts on such technologies. That is, what price, both users and investors are willing to pay for the income-benefits of a structure that does not download costs into the future. It would also demonstrate the cost of not taking such a course of action. Something which could be measured in terms of the different present values of those properties with and without the technologies in question. While, this does not account for the spillover, or external costs/benefits associated with such a course of action, it ought to be possible to satisfy this by some non-standard form of, hedonic, or contingency exercise (in this instance forming the basis of a life cycle analysis and environmental impact assessment) geared towards a willingness to accept the inter-generational loading in question. The effect this form of valuation, combining, as it does, both market and environmental criteria, has on the appraisal of investments would also need to be placed under examination;
(h) RFR + r* gives an indication of the parameters i.e. upper and lower levels of the discount rate, r, or initial yield K, whereas g provides an indication of anticipated growth. The significance of this being that both variables are linked into the capital markets of the economy and provide the opportunity to

estimate the effect any change in the relationship between Oi and r will have not just upon the time-horizons and spatial configuration of land use and building programmes (for example; the income benefits of longer time-horizons, more compact spatial configurations, lower risk, greater growth and cost-savings) but in terms of the reduced rates of obsolescence and depreciation brought about by the introduction of experimental designs aimed at energy-saving, clean air technologies. In short a reduction in the costs of intergenerational downloading not only from a given land use or building programme, but city as a whole. The same is true for equation (2), but here the effect also extends into D and B;

(i) here again the effect of the cost of introducing such new technologies into the (re)development of land uses and building programmes could be analysed to establish at what point the income benefits become efficient in economic terms and socially equitable from the environmental point of view. Such an analysis would be in accordance with the policy towards longer term time-horizons and more compact spatial configurations for energy consumption in the use and land and buildings in the city (Breheny, 1992; Symes, 1997).

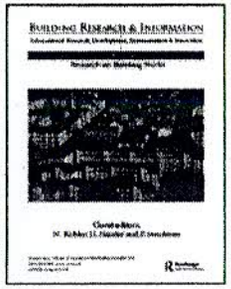
This list of considerations does not of course exhaust all the issues in question; it merely sets out a framework for analysis that makes it possible to circumvent many of the criticisms made about the discounting principle. The principle that underlies the NAR model of valuation and investment appraisal, its representation of the time-horizons and spatial configuration of land use, building obsolescence and depreciation. The time-horizons, spatial configuration, land use, building obsolescence and depreciation of particular concern to those with an interest in life cycle analysis and environmental impact assessment.

What this adjusted NAR-type model does is turn the principle of 'the polluter pays' around by introducing the means by which those agents of change in the market (i.e. designers, engineers, contractors, planners etc) can undertake the life cycle analysis and environmental impact assessments that *not only value, in market, bio-physical and ecological terms, the economic efficiency and social equity of such contributions to the marginal productivity of capital, but compensate them with a rate of return which is seen as fair and just from the environmental point of view. Without this and what is in effect an environmentally-friendly, green pricing mechanism*, it would not be possible to overcome the legacy of market failure in dealing with the environment and link the means with the ends i.e. the market basis of the valuation and investment appraisal underlying the adjusted NAR model, with the time-horizons and spatial configurations of environmentally-friendly, green technologies for land use and building programmes. That is, *show 'how it pays'*, in terms of the market and environment, to introduce energy-saving technologies with lower carbon-based emissions. Without this link it would not be possible to demonstrate the range of opportunities open for the state to finance experiments of this kind and show *the real value*, such land uses and building programmes offer the public for not only as a form of environmental conservation (be it in terms of energy, or natural capital consumption) capable of sustaining economic growth, but an enhanced quality of life.

Conclusions

This paper has examined the critique of the discounting principle environmentalists have made in relation to valuation investment appraisal and its application in the income based NAR model of land use time-horizons and the spatial configuration of building programmes. In particular it has looked at the link made between the selection of a discount rate, the valuation, appraisal of investment and the inter-generation downloading of costs associated with the use of land, repair, maintenance and refurbishment of buildings. In examining this debate it has found the criticism wanting. It has also sought to expose some of the contradictions within the arguments put forward. The argument that it is this downloading of cost which works against the introduction of experimental designs aimed at environmentally-friendly, green land uses and building programmes in particular. In doing so the paper has also sought to demonstrate the connection made between discounting, valuation, appraisal of investment and downloading of costs is tenuous and open to question.

In addition to this, it is hoped the paper provides a means to strengthen the relationship between life cycle analysis, environmental impact assessment, valuation and appraisal in the context of previous discussions surrounding such matters. With this in mind, it has sought to allay any fears those responsible for valuations and investment appraisals might have about using NAR type models. It has done this by focusing attention on the positive contribution market based valuations and investment appraisals can make to life cycle analysis and environmental impact assessment. This is an important point because given the undue criticism they have attracted there is some doubt about the utility of such models. The outcome of this being seen in the switch of attention away from NAR type models of market valuation and investment appraisal and towards the life cycle analysis and environmental impact assessments. Something, which in itself is questionable for the fact that it has left a gap between the market and environment.



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Citizens' expectations of information cities: implications for urban planning and design

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Citizens' expectations of information cities: implications for urban planning and design

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The European Union has made the development of a vibrant knowledge-based economy a key policy objective, and increasingly national and local governments worldwide are seeking to harness information and communication technologies to provide government services more effectively and for the benefit of their citizenry. The paper reports on the first phase of the ongoing European Union IntelCities integrated project that seeks to integrate electronic governance of cities and urban planning. The background to the project in terms of the e-Europe Action Plan is explored and the outcome of surveys of user needs and requirements carried out in the cities of Marseilles (France), Siena and Rome (Italy), Helsinki (Finland), Leicester and Manchester (UK), and Dresden and Berlin (Germany) are explained. The outcomes identify a range of implications for digital or electronic planning in terms of increasing the efficiency in e-urban planning and the need to develop digital methodologies for widening public participation. Thus, the importance of e-skills development in new forms of e-planning for planners, developers and citizens is highlighted and shown to be important for achieving a wider e-enabled sustainable knowledge society.

Keywords: e-government, e-planning, electronic governance, electronic services, infrastructure, knowledge society, public participation, regionalism, sustainable development, urban planning

Parmi les objectifs politiques majeurs que s'est fixée l'Union Européenne, figure le développement d'une économie dynamique basée sur la connaissance; de plus en plus, dans le monde entier, des gouvernements, au niveau national ou local, cherchent à maîtriser les technologies de l'information et de la communication pour fournir leurs services avec davantage d'efficacité et pour le bénéfice de leurs citoyens. Cet article rend compte de la première phase du projet intégré IntelCities que mène l'Union Européenne et dont l'objectif est d'intégrer l'électronique dans la

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gouvernance des villes et dans l'urbanisme. L'auteur rappelle l'historique de ce projet dans le cadre du Plan d'action e-Europe et commente les résultats des enquêtes sur les besoins et les exigences des utilisateurs, qui ont été menées à Marseille (France), Sienne et Rome (Italie), Helsinki (Finlande), Leicester et Manchester (UK) ainsi qu'à Dresde et Berlin (Allemagne). Ces résultats font apparaître un large éventail d'implications pour la planification numérique ou électronique en termes d'amélioration de l'efficacité de l'e-urbanisme et la nécessité de développer des méthodologies numériques pour élargir la participation du public. L'auteur met ainsi en lumière et démontre l'importance du développement des e-compétences dans les nouvelles formes de e-planning pour les planificateurs, les promoteurs et les citoyens dans la perspective d'une société du savoir basée sur les technologies numériques

Mots clés: e-gouvernement, e-planning, gouvernance électronique, services électroniques, infrastructure, société du savoir, participation du public, régionalisme, développement durable, urbanisme

Introduction

Internet access is expanding rapidly. For example, Internet penetration into households across the whole of Europe is likely to exceed 50% in the near future. In the situation where around 50% of the world's population and more than 70% of Europeans now live in urban areas, towns and cities, visions of the knowledge society and the city raise contradictions. On the one hand, cities are centres of innovation; they are the location for advanced information communication technologies (ICT) developments and are understood to be the engines for change for regional and national economic progress towards the knowledge society. On the other hand, in connected communities, the virtual space is not location specific. There is no point knowing through the Internet what books are on the shelves of the local city bookshop when one has the capability of purchasing books through virtual bookshops (such as Amazon), which may be located in a distant warehouse in another part of the country or indeed in a different country. However, the virtual bookshop still needs to know where in which city the book is to be delivered. Hence, from a policy perspective, the interaction between cities and ICTs is expected to continue to act both as the key driver and as the primary location for the delivery of the knowledge economy and society.

This paper reports on the findings of user needs studies undertaken in the first phase of the ongoing European Union (EU) IST Framework 6 research project – IntelCities (Intelligent Cities) (2004). This project aims to develop a prototype integrated information system for cities, known as the 'e-city platform', which for the first time will link the developing range of electronic local government services (e-government.) with those of local planning, urban development and regeneration (e-planning). The outcome will form the basis of an electronic information infrastructure, which is seen as a necessary requirement for the development of the knowledge society in cities, as envisioned in the research roadmap for sustainable information cities developed in the preceding INTELCITY Project (2003) (Figure 1). This sought to address the dual-policy targets emerging from the EU summit in Lisbon, i.e. to achieve a vibrant 'knowledge-based information society' by 2010 and sustainable development by 2030. In turn, the roadmap is based on the principles and practice of sustainable urban development emerging from the EU transdisciplinary research networking project BEQUEST (www.research.scpm.salford.ac.uk/bqextra/) (Bentivegna *et al.*, 2002; Cooper, 2002; Curwell and Deakin, 2002; Deakin *et al.*, 2002; Kohler, 2002).

In the present paper, the background and context of the IntelCities project is explored in terms of the *e*Europe 2005 Action Plan (CEC, 2002), which sets out intermediate goals for the development and take-up of ICTs towards the Lisbon Summit target and through a brief summary of the project. Subsequently, the outcomes of the user-needs studies undertaken to date are set out together with a summary of the range of methods used. Finally, in conclusion, the implications of the user needs findings for urban planning and design are drawn out.

eEurope 2005 Action Plan

In the EU, the *e*Europe Action Plan forms part of the Lisbon strategy to build a knowledge-based economy by 2010, with improved employment opportunities and social cohesion. It is one of the main instruments to build an 'information society for all' and this is being rolled out in phases. The final report on the previous phase, *e*Europe 2002, showed that the majority of its targets had been met and that nearly all business and schools are connected to the Internet; the number of households connected has nearly tripled (to more than 50%) and Europe has the fastest research network in the world (CEC, 2003).

However, it also showed that by the end of 2002, there was little evidence to show that the success in getting Europe on-line had been translated into new jobs and services. Nor were the increases in productivity observed elsewhere, notably in the USA, as visible in Europe. Connectivity was there, but use was lagging behind (CEC, 2003).

Thus, given the wider access to Internet, attention in the 2005 Action Plan has naturally turned to policies aimed

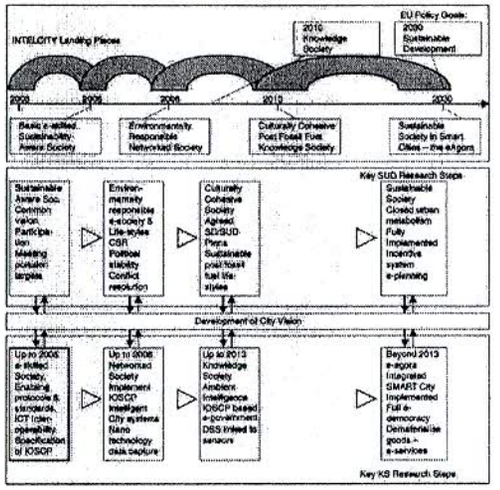

Figure 1 INTELCITY Roadmap Summary, with the IntelCities element highlighted within a black box (bottom left).

at stimulating demand in terms of increased usage and impact (see the main aims shown in the box below).

eEurope 2005 Action Plan
By 2005, Europe should have the following:

- modern on-line public services
- e-government
- e-learning services
- e-health services
- dynamic e-business environment

and as an enabler for these, the following must occur:

- widespread availability of broadband access at competitive prices
- secure information infrastructure

A European good-practice framework for e-government was launched in 2004 (eGO, 2004) and the recent review of progress towards the *e*2005 Action Plan goals (CEC, 2004) proposes its widespread adoption in 2005 (Action 4) though increased interoperability and good practice exchange. Thus, in terms of e-government, the main aims of the *e*Europe 2005 Action Plan can be summarized as follows:

- to stimulate the development of on-line services, covering both the modernization of public services and the creation of a dynamic environment
- to advance the underlying infrastructure (wired and wireless) and address security matters
- to develop an interoperability framework supporting the on-line services and the underlying infrastructure
- to develop the platforms needed for public administrations to deliver on-line services, with the underlying infrastructure and interoperability required

The IntelCities Integrated Project (IP) is a major component of the *e*Europe 2005 Action Plan and forms one of the mainstays of the European Commission's Information Society and Technology (IST) Research and Development Programme in FP6 (2003–08). In line with the findings of the Cap Gemini (2004) and

Top of the Web (2003) studies, commissioned by the European Commission to benchmark this development programme, IntelCities aims to develop the platform of interoperable infrastructure for local city administrations to deliver on-line services in a creative and dynamic virtual environment.

IntelCities Integrated Project (IP)

The 'vital statistics' of the IntelCities IP[1] are summarized in Table 1. The main objective of the project is to create a new and innovative set of interoperable e-government services[2] to meet the needs of both citizens and businesses. This will provide interactive city-wide on-line applications and services for users that will make all aspects of what is 'going-on' in the city available to all, which will support the following:

- everyday needs and requirements of citizens and business through 24-hour access to enhanced and integrated transactional city services
- more efficient city management and administration by integrating functions and services across city authorities, regional and national governmental agencies, utility and transport system providers and citizens/non-governmental organization networks
- much more innovative and effective approaches to urban planning through more reliable electronic city modelling, using advanced visualization and predictive techniques, which will enable citizens and businesses to play a far more participative and inclusive role in influencing how planned changes in the city will affect their lives

The real nature and potential of the knowledge society is still largely a matter of conjecture and in order to address the *e*Europe 2005 e-government objectives listed above, IntelCities is undertaking a number of prototyping studies. This initial conceptual model of the e-city platform represents the dynamic environment for on-line public services delivery and indicates the wide range of technologies and data sources to be integrated through modular development in a number of EU cities. In this context, IntelCities has to address three main challenges:

Interoperability challenge:

> how a wide range of city e-government, local planning and visualization ICT hardware and software systems as well as how the underlying legacy of data can be integrated through the e-city platform

Urban living laboratory challenge:

> to experiment with a number of emerging technologies (e.g. mobile) and to demonstrate re-engineering of some existing technologies (e.g. interactive television, or iTV) for e-government in real communities. This is exploring the nature of new forms of city e-service and ways to make them more inclusive, e.g. the elderly and the very young can use the iTV handset!

To understand the local government *organizational transformation challenge*:

> how to restructure the city organization and develop the capacity of civil servants, citizens and business necessary for wide implementation in the vast majority European towns and cities in ways that will reap the benefits offered by the new technology for more inclusive local e-governance and e-planning

To address these challenges fully, the IP has been constructed of five activity areas in a matrix structure (Figure 2). Activity area A relates to the six technical development prototype modules (and host cities): e-administration (Marseilles, France), e-inclusion (Siena, Italy), e-participation (Helsinki, Finland), e-mobility (Rome, Italy, plus Leicester, UK), e-land use (Dresden plus Berlin, Germany) and e-regeneration (Manchester, UK). As shown, activity areas B–D cut across activity area A and underpin the technical development and organizational transformation in the prototypes with the ICT research and technical development (RTD), knowledge management and e-governance innovations required to integrate the activity areas and produce the interoperability, knowledge management, capacity building and governance needed to support the delivery of local on-line public services.

Table 1 IntelCities vital statistics

IST project number	507860
Duration	18 months: January 2004–July 2005
Budget	€11.7 million (European Union contribution €6.8 million)
Consortium	Critical mass of 18 cities, 20 information communication technology companies, 36 research groups including 16 small- and medium-sized enterprises in 20 European counties
Research and technical development methodology	Iterative action learning 'Living Labs', where research and technical development (RTD) pilot studies are embedded in cities and address citizens' and cities' needs. Demonstration of an interoperable e-city Platform to be formed by integrating prototype modules developed in six cities. Prototypes involve exploration of new business models, e.g. public–private partnerships, which offer new ways of delivering services and business opportunities
Coordinator	City of Manchester: Dave Carter, Head of Digital Development Agency
Scientific and technical direction	University of Salford: Professor Steve Curwell, Research Institute for the Built and Human Environment

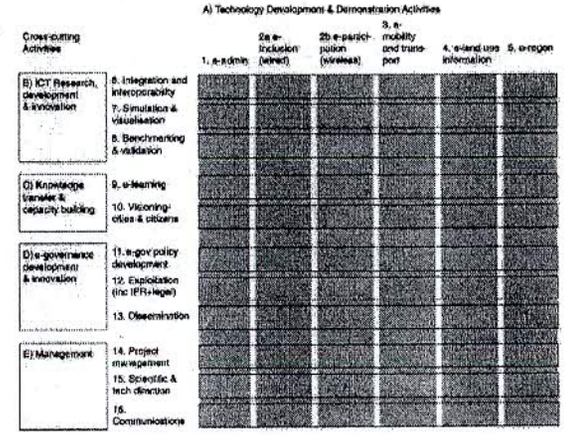

Figure 2 IntelCities: project structure and main activities

Citizens' user needs and requirements capture

The underlying principle behind the 'living laboratory' prototyping being undertaken in the project is to attempt to avoid repeating mistakes of past city ICT programmes and make the IP user driven rather than technology led. In this respect, it sets out to introduce a user–provider paradigm of service delivery, where it is the needs of the former that set the technological requirements of the latter and which drive the project, rather than the other way around. From previous experience and the literature on the development of on-line services, it is known that citizens tend to be unclear about the new possibilities presented by the applications making up the e-city platform. It is for this reason that in addition to a range of traditional surveys using questionnaires, structured interviews and telephone interviews, the IP has embarked on a number of roadshows to envision the nature of future of e-city services and stimulate the views of citizens on the technical developments making up the demonstrations of on-line services. Table 2 shows the nature of the surveys undertaken in each city prototype. The outcomes of the surveys are reported in two steps. First, the key information and the main points from consolidation of the outcomes of the roadshows and, second, from the questionnaire surveys from the prototypes addressing e-inclusion and participation issues.

Consolidation of user needs and stakeholder requirements

The roadshows addressed citizens' current preferences as well as exploring their perceptions of future needs and requirements. This provides a cross-regional assessment of the citizen–technology relationship in the host cities by comparing the results obtained from the roadshows in Marseilles, Rome and Manchester.

Current preferences for access to on-line services and ICT media and interfaces are shown in Tables 3 and 4, respectively. The main outcomes can be summarized as follows:

- Access to e-services: currently there is a greater access to (and thus greater interest in?) general information services, leisure, transport, voluntary groups plus charities, and environment plus open space.

Table 2 Technical development and demonstration studies

Prototype	Main city location	Main focus	Anticipated outcomes	Survey type(s)	Sample size of users/ stakeholders
1. e-admin	Marseilles	nature and provision of local administrative services	development and migration routes from existing web services	roadshow	21 (all citizens except two business)
2a. e-inclusion (wired)	Siena	new and more inclusive ways of working – expanding use of the existing wired system	detailed understanding of economics and use factors of iTV potentialities	telephone interview questionnaire	1000 (predominantly citizens)
2b. e-participation (wireless)	Helsinki	initial community experiments via mobile interaction	preliminary understanding of mobile devices for e-participation	questionnaire	150 (predominantly citizens)
3. e-mobility and transport	Rome and Leicester	real-time mobility information services	understanding technical integration problems and solutions	roadshow and questionnaire	roadshow – 60 (including citizens, city and business groups)
4. e-land-use information	Dresden and Berlin, and others	e-broker land-use information system	understanding the role and potential of urban GIS	structured interviews	seven expert technicians from five cities: Berlin, Bern, Dresden, Prague and Warsaw
5. e-regeneration	Manchester	e-planning (inclusive strategic planning and development control)	development of stakeholder ownership of plans and programmes	roadshow	roadshow – 21 (predominantly citizen representatives, but some city and business)

Note: Total sample is 1259, of which the vast majority are from the citizen group. GIS, global information systems

Table 3 Current frequency of access to city e-services

Types of service	Yes	No
General website information	31	2
Housing	10	19
Planning and land use	14	18
Leisure and entertainment	25	3
Transport	32	4
Waste disposal	13	18
Education	15	15
Social services	16	16
Crime and safety	11	20
Regeneration	17	18
Business advice	21	10
Voluntary groups and charities	21	9
Environment and open space	25	8
Regional issues	15	4
Contacting councillors	13	20

Note: Consolidation of Marseilles and Manchester roadshows.
Sample = 42.
Most favoured services are shown in bold.

- Interfaces and communication media: current preferences unsurprisingly favour the ubiquitous desk-top computer and Internet, although telephones and laptops score moderately well. The very low preference expressed for local television is surprising. However, the low preference for public access points, such as kiosks, confirms the poor experience and low take-up with this type of terminal in some cities.

The roadshows also included self-assessment of e-skills. The participants reported an average of 70% good or higher e-skill, which suggests that the majority are competent in the use of digital services, in particular the Internet and e-mail technologies provided through computers and laptops. Given the diverse nature of the citizens involved in the roadshows, this good and higher e-skill level provides a strong basis for on-line service development and distribution in the cities concerned and increases confidence in the general validity of all the responses made in the roadshows.

Table 4 Current preferences for access to e-services

Communication media and interface devices	Yes	No
Telephone	45	50
Mobile phone	37	57
Personal digital assistant (PDA)	13	74
Public information desks/kiosks	18	72
Personal computer (desk top)	73	19
Laptop computer	43	47
Internet	88	10
Local radio	34	59
Local television	19	74

Note: Consolidation of Marseilles, Manchester and Rome roadshows.
Sample = 102.
Preferred media and interface are shown in bold.

There was a noticeable lack of cross-regional differences in the level of e-skills and technology preferences between the cities in the roadshows. As explained above, the Internet technologies are most frequently used, via computer and laptop. This is clearly the main form of access either at home or at work. One noticeable distinction is a strong Italian preference for the mobile phone, whereas the French express a preference to supplement the technology with personal, face-to-face contacts. They are also interested in future development of iTV. The lack of interest in the personal digital assistant (PDA) is common to citizen groups from all the three cities (Table 4).

In the roadshows, concern was expressed over the expanding skills gap and 'digital divide', how the technologies are distributed and access for all (e.g. high cost versus low income, disabled users, etc.) and in other underlying structural issues related to security and ownership of the data and access by third parties. Here there was a clear balance of opinion in favour of public rather than private provision in terms of creating greater trust and confidence in citizens.

In terms of future needs and requirements the current bundle of supporting technologies and applications was seen as providing a platform capable of distributing e-services to users when and where required. In view of the diverse range of issues, participants addressed in the story lines and the future scenarios they embody, e.g. training, employment, business expansion, premises search, etc., it is evident they all saw provision of e-services as an opportunity to enhance citizen's access to information needed with which to effect life-changing decisions, e.g. gaining access to occupational training opportunities, expanding a business enterprise or finding employment. However, the future service preferences expressed tend to support the particular policy priority in the cities concerned, i.e.:

- Marseilles: distance learning and skill development, employment services
- Rome: mobility and transport information, traffic information
- Manchester: extended and more integrated city information, planning information

This can be seen as very positive reinforcement for the prototype studies. However, this may be a direct result of the format of each of the roadshow events.

A number of detailed requirements and aspirations over how on-line services might develop in the future were identified in the roadshows, but are too extensive to

explore here adequately. Table 5 shows one example – the transport and mobility service in Rome, but overall this is best summarized through the space–community matrix used in the roadshows and shown in Table 6. This aspect is of great interest to planners as it relates citizen's perceptions of the anticipated means of communication, types of consultation and capacity development in order for citizens to be fully empowered to spatial position, i.e. where communication and consultation are to be physically located, ranging from the home to the Web. This shows subtle differences in how citizens see, and how and where they might interact with, different aspects of the three classes of on-line service in the prototypes: e-admin, e-mobility and e-regeneration.

Questionnaire surveys: Siena and Helsinki

This section contrasts specific differences from Northern and Southern Europe. Siena is in many ways a unique city. Its heritage dimensions extend to its traditional community system in place from the medieval period. The telephone interview survey contacted over 1000 citizens across the whole city to seek their views of a number of new iTV services, using the wired broadband system capability installed some time ago in the city. In Helsinki, there is interest in extending participation in e-services by wireless local area networks, due to the potential for wide inclusion possible via the 97% mobile ownership in the city. The self-filled survey aimed at the community level focusing on a redevelopment area: Arabianranta (2004). One hundred and fifty citizens returned questionnaires.

Arabianranta is a 'young' community composed of a majority (62%) of the population under the age of 40 years. It has been created with the specific intention of creating a virtual village and leading centre for art and design.

Results from the surveys (Table 7) contrast the remarkably differing e-skill levels and degree of access and connectedness between the two cities. There is clearly lower interest in e-services in Siena with the highest score being less than 50% of the sample, but the results are skewed by the age and gender balance of the sample. This result is very significant for Siena Innovatione, the publicly owned company charged with developing the e-government services in the city. However, deeper analysis of the responses from underrepresented age groups and occupations in this survey shows a much bigger proportion of interest from these groups. Responses for some services such as e-shopping will be influenced by the compact physical nature of the city and availability of local shops. In Helsinki, Arabianranta, the high scores for a number of very local community services support the view that a strong e-community is developing combined with a demand for new 'bottom-up' participation mechanisms.

Conclusions: with the implications for e-planning

Service preferences

Overall, the surveys undertaken have indicated that there is no clear citizen-driven demand for on-line civic services. The possible exception is the 'early adopter' community in Arabianranta, Helsinki. The demand emerges more from the city and business stakeholders who see economic or business opportunities or efficiency savings. Nevertheless, citizens welcome these services to the extent that they save time, reduce cost, widen access and participation, or assist with major life problems and generally 'make life easier'. Thus, preference is given to e-services such as employment, business start-up, travel and mobility, and leisure and entertainment. However, the high priority given to environmental services (Table 3) is important for urban design and planning.

The roadshows highlight that a 'one-size-fits-all-citizens/services' specification of user needs will be insufficiently sophisticated to meet the range of responses discovered in the host cities. Instead, a more finely tuned approach is required taking account of variations across stakeholders, the services provided and the structural issues that these raise and which might differ between cities. It is clear that all stakeholders are coming to expect that information should be 'everywhere' through services available 24 hours a day and seven days a week, and through various means, both through ICT and more traditional human-to-human, face-to-face interaction. Clearly, these requirements will be important for the future development of e-planning services.

The relatively weak enthusiasm for all aspects of e-services from citizens is constrained and/or limited by a number of concerns:

- 'who is the provider' and 'who is the owner' of the services and underlying information; there are regional differences in relation to the depth of concern
- services should be public and civic in nature, dedicated to citizens and their respective cities, and not just a business transaction
- what is the cost? Services are highly price-sensitive; the obvious preference is for free on-line access!
- inequitable delivery of benefits

Together, these points reinforce current concerns, e.g. in the UK (Office of the Deputy Prime Minister, 2004) and elsewhere over how development and planning can effectively use cyberspace. On the one hand, provision of an e-city platform that integrates data

Table 5 Example of specific service application envisioned in a roadshow

Specific service application	Technology information communication technology potential	Introduction and story-line projections	Positive/negative hopes/fears	Implications	'Success scenario'/ recommend action
Access to intelligent mobility	Tourist portal integrates information from all city departments (transport, culture, sport, etc.)	Planning a tourist trip	Prefer the quick solutions in which it is unnecessary to spend time to organize a trip in advance, neither to chat with experts or with people having the same problem	Mistrust in the traditional face-to-face tourist services such as the tourists board compared with strong confidence in on-line services and in their improvement in the future	Request to spread Internet kiosks in the city
	Search engine helps to satisfy customized requests in terms of time, costs and places	Understand in advance how to get tickets, costs, a timetable and attractive paths to organize sightseeing			Use of mobile phone, digital television, portable digital bulletins, mobile information displays
	Link with a list of other interesting sites such as the weather and traffic forecasts	Need to know the opening hours of selected museums and which public transport should be preferred			
	Availability of all this information (words and pictures) on mobile phones	Choose nicest/ quickest path			

Table 6 Space–community matrix

	Home	Block of flats	Neighbourhood	City	World
e-administration					
Communication	Internet, telephones		totem		
Events			cyber-café	e-thematic evenings, on-line games forums	
Consultation	Internet, iTV				
Empowerment	Internet, training with a web-cam	help among neighbours	computer training		on-line, business
e-mobility					
Communication	info-mobility, portals	Internet	telephones, kiosk	totem, road signs	Internet
Events					
Consultation				events on SMS	
Empowerment		help among neighbours			
e-regeneration					
Communication	computer, mobile phone		kiosks	public Internet telephones	
Events					
Consultation					
Empowerment		smart infrastructure	intelligent devices	e-learning, smart cards shopping for food	shopping for books

Note: SMS, short messaging service

from a range of sources, transport, entertainment, utility services, etc., and the spatial relevance in each case will provide planners, politicians, business and citizens with a clearer basis upon which to base re/development decisions. Constructing integrated models of the city and simulating the impacts of planned changes can improve the consideration of options and provide more realism to both citizens and business leaders. The resulting citizen-to-citizen and citizen-to-planner discourse can help both planners and developers be more aware of public views and could evolve into a more inclusive and more

Table 7 Comparison of service preferences between Siena and Helsinki

	Siena (WP2a)	Helsinki (WP2b)
Citizen's degree of interest in and order of preference of e-services offered in the survey	Certificates and documents request (48%) Medical reservations (42%) Payment of fees and taxes (39%) Travel and events reservation (38%) Browsing the Internet by broadband (36%) Distance learning and training (21%) Shopping from home (14%) Buying stock and shares (11%)	Flea market (77%) Participation tool (66%) Reservation of shared spaces (55%) Public discussion group (54%) Voting/polling tool (53%) Electronic coupon (50%) Joint ordering (for lower cost goods) (46%) Sponsored pages (21%) Instant messages (12%) Chat (11%)
Age parameters	61% over 40 years (31% retired)	38% over 40 years
Gender balance	female 65%/male 35%	female 56%/male 44%
e-Skill and technology penetration	50% technology penetration; e-skill level appears to be average with 58% reporting that they surf the Internet, although 40% do not have a computer at home and so must connect at work, at college or at a friend's house	High-technology penetration (90%) Good to very good level of skill with 60% using the Internet at least once or more per week

'democratic' bottom-up process, where greater consensus on the nature of planned changes is achieved. In this way, citizens may have better ownership of planned changes and be more prepared to give them active support, e.g. once cycle paths are created, to use their bicycle rather then their car for commuting.

In this context, the roadshows illustrate that there is a general and positive belief that ICTs can enhance the efficiency and quality of e-service delivery generally. Policy needs to be directed to seek efficiency gains, e.g. the automation of the development control process through electronic delivery and processing of plan submission, so that officers can spend more time engaged in the discourse described. Officers will need career development training in order to acquire new networking and virtual group management, and consensus building skills in order to facilitate an interesting and (dare it be said) enjoyable process that effectively engages all sections of society in urban planning.

Technology preferences

The bundle of technologies already available is seen by the majority of citizens as appropriate to support the service applications addressed in the surveys and roadshows. Service dependent and regional preferences are detectable for computer–Internet, mobile phones, kiosks and iTV, so that no delivery-access options should be ruled out. However, personal computer–Internet technologies, closely followed by mobile phones, supported with access points in public buildings were the main preference for citizens. One outcome of this could mean that developers and planners need to use new ways of visualization and modelling of development including virtual reality, so that proposals can be viewed by residents and other concerned citizens through a wide range of interfaces at home and elsewhere.

Access, ease of use, e-skills and influence on inclusion

The surveys have strengthened the awareness that a majority of citizens remain out of reach because they do not have access to the networks – they are not connected, are not equipped with adequate e-skills or devices, or cannot afford the cost. Electronic services are too complex to use and require education and training. This situation is exacerbated by the fact that the current range of e-government services is not integrated. The survey has highlighted that government 'silos' create problems for the government machine itself, as well as for citizens and business. There are many isolated providers, making it tedious and confusing for citizens and business in their relationships with government and between civil servants and politicians. Thus, it is necessary for cities (and business) to reorganize themselves and adopt new ways of working.

Clearly, this is a major aspect of the prototype studies within IntelCities, but three preliminary conclusions can be drawn for city planners, developers and urban regeneration professionals:

- It is very important for the current subdivisions that exist in local authorities between digital development, economic development and physical planning are broken down. ICTs are revolutionizing business and how citizens use cities (Castells and Hall, 1994; Mitchell, 1999). The way in which cities, ICT soft- and hardware providers work together in partnership (in PPPs[3]) will be the key to the cost/functionality/efficiency equation in the provision of e-planning.
- Planning the development of the electronic infrastructure must be integral with that of the physical infrastructure. Acknowledgement and support are required for planning, financing, implementation and maintenance in a similar way as the roads and the drains!
- Development of e-planning should not simply involve moving current processes to the Internet so that the letter informing of a development proposal comes by e-mail rather than the usual ('snail') mail. To achieve potential efficiency gains though e-planning, it will require fairly radical restructuring and new ways of working. The bottom-up participation and empowerment processes in planning alluded to above are considered an important aspect of more sustainable communities (Bentivegna *et al.*, 2002). If the new IT tools are to be deployed in ways that enhance the process and leverage the potential for real inclusion (and not just to create savings in cost and time), then the costs of entry and of maintenance of the service, and the e-skills of various citizens groups and how planners can facilitate the process will require attention. New rules of engagement and standards will need to be developed. What can be done 'virtually' and what still needs face-to-face contact? Developing good practice in visioning, understanding user needs and requirements, and how this can be translated into virtual space is an on-going issue in the prototyping studies being undertaken in IntelCities.

Translation of urban planning into the digital age highlights e-skills and knowledge deficits in all stakeholders: planners, developers and citizens; the importance of the provision of e-learning and support, capacity building and the need for standards to 'govern' the e-city as a platform as a means of providing planning and e-services generally. There is a real risk that certain groups, particularly developers, will see the more consensual approach as a threat, adding delay and costs to the re/development process.

However, citizens' responses explored in this paper support the view that e-planning should be seen as an opportunity to ground development proposals in the locale and to meet stakeholders needs more effectively. This will diffuse the adversarial nature of urban redevelopment, as evidenced, for example, in the UK and Ireland, and instead harness a consensus to support the creation of a dynamic urban environment in both physical and virtual space.

The work in IntelCities and in the preceding projects (INTELCITY, 2003) have called into question one implicit assumption of the Lisbon objectives. That is the implied 'soft transformation' from resource-intensive traditional industry towards much more resource-efficient knowledge and service industries of a dynamic information society, and that this will contribute to achieving more sustainable development. Urban planning and urban redevelopment professionals are well placed to integrate policy in both these areas in cities. To do this effectively, new metrics are needed to measure progress: to establish the contribution that the e-services and e-business are making to overall economic and social progress as well as to environmental improvements in cities. This needs to be much more fine-grained than the global studies undertaken to monitor the overall progress towards the *e*Europe Action Plan and to benchmark against other advanced nations, particularly the US (Top of the Web, 2003; Cap Gemini, 2004). The issue of impact evaluation of the information society at the city and regional scale is one aspect of ongoing collaboration between EU e-government and US Digital Government researchers fostered jointly by the Federal National Science Foundation and the EU Directorate General for the Information Society. IntelCities is actively participating in this work and is developing a benchmarking tool to include a number of issues surrounding city logistics, which will include measures by which the outcomes of e-planning can be evaluated. This work will be reported in late 2005.

Acknowledgement

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Notes

[1]The IP is a new form of research 'instrument' introduced in the EU's Sixth Framework Programme (FP6) to support larger projects of adequate critical mass in order that research, technical development, demonstration and knowledge management can be integrated and lead to more effective exploitation and implementation of results in society.

[2]The technical term 'interoperability' means the ability to operate together, i.e. for the ICT systems 'to talk to each other' and to enable one system to use data from another, e.g. for the systems of the traffic police, emergency services, transport companies and the cities technical services to be integrated so that they, as well as citizens and visitors, can jointly access data through various interfaces and locations. The type of information integrated includes up-to-date timetables, traffic status, parking and events information with data on the nature, extent and location of construction projects and roadworks proposed and underway in the city. This will enable traffic police and transport service providers to manage movements through the city more effectively, for the emergency services to move quickly through congestion, and for citizens and businesses to find and plan the optimum route or transport mode on any particular day of the week.

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Chapter V
The IntelCities Community of Practice:
The eGov Services Model for Socially Inclusive and Participatory Urban Regeneration Programs

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ABSTRACT

The chapter examines the IntelCities Community of Practice (CoP) supporting the development of the organization's e-Learning platform, knowledge management system (KMS) and digital library for eGov services. It begins by outlining the IntelCities CoP and goes on to set out the integrated model of electronically enhanced government (eGov) services developed by the CoP to meet the front-end needs, middleware requirements and back-office commitments of the IntelCities e-Learning platform, KMS and digital library. The chapter goes on to examine the information technology (IT) adopted by the CoP to develop the IntelCities e-Learning platform, KMS and digital library as a set of semantically-interoperable eGov services supporting the crime, safety and security initiatives of socially-inclusive and participatory urban regeneration programs.

INTRODUCTION

The notion of the intelligent city as the provider of electronically-enhanced services has become popular over the past decade or so (Graham and Marvin, 1996; Mitchell, 2000). In response to this growing interest in the notion of intelligent cities, researchers have begun to explore the possibilities of using CoPs as a means of getting beyond current 'state-of-the-art' solutions and use the potential such organizations offer to develop integrated models of e-government (eGov) services (Curwell, et.al, 2005; Lombardi and Curwell, 2005). This chapter shall report on the outcomes of one such exploration and review the attempt made by a consortium of leading European cities to use the intelligence that CoPs offer as the organisational means by which to get beyond current state-of-the art solutions. The CoP in question is that developed under the IntelCities Project[1] and which is known as the IntelCities CoP. The chapter shall report on the development of the IntelCities CoP under the leadership of Manchester and Siena. It shall explore the value of using CoPs as the organizational means by which to secure the intelligence - humans and artificial - that cities need to develop integrated models of eGov services. Integrated models of eGov services seen as being of particular value for the reason they meet the e-learning needs, knowledge transfer requirements and capacity building commitments of Europe's policy on socially-inclusive and participatory urban regeneration programs.

THE INTELCITIES COMMUNITY OF PRACTICE

The IntelCities CoP is made up of research institutes, information, communication and technology (ICT) companies and cities, all collaborating with one another and reaching consensus on how to develop integrated models of eGov services. Made up of researchers, computer engineers, informational managers and service providers, the IntelCities CoP has worked to develop an integrated model of eGov services and support the actions taken by cities to host them on platforms (in this instance something known as the eCity platform) with sufficient intelligence to meet the e-learning needs, knowledge transfer requirements and capacity building commitments of socially-inclusive and participatory urban regeneration programs (Deakin and Allwinkle, 2006).

As an exercise in CoP development, the organization is particularly successful for the reason the intelligence it has sought to embed in cities and integrate within their platforms of eGov services, is inter-organizational, networked, virtual and managed as part of a highly-distributed web-based learning environment. If we quickly review the legacy of CoPs in organizational studies, the value of developing such a learning environment should become clear. For as the literature indicates, CoPs are an emergent property of organizations and the challenges they pose for those seeking to exploit their potential in such learning environments is considerable.

Literature on CoPs

The literature on CoPs reveals many different kinds of situated practices, all of them displaying quite varied processes of learning and knowledge generation, gathered around distinct forms of social interaction. In this respect, Wenger's (1998, 2000) studies of CoPs is of the ways that insurance claim processors and other such occupational groups learn to be effective in their job. Orr (1996) also studies the importance of CoPs amongst photocopier repair technicians. Osterlund (1996) studies are of CoPs as learning organizations that cut across craft, occupational and professional divisions and which transfer knowledge between them. The collective representation of CoPs in the literature suggests such organizations have the characteristics displayed in Table 1.

Taking this representation of CoPs as a starting point for their examination, Amin and Roberts (2008) suggest there are four distinct types of inter-organizational learning and knowledge transfer. These being: craft, professional, creative and virtual.[2] As Amin and Roberts (2008) go on to point out, until recently it has been assumed that virtual organizations cannot be considered as a CoP, promoting learning and transferring knowledge on its own terms. Although, as they go on to stress, as it becomes easier to communicate with 'distant others' in real time and in increasingly rich ways, interest is now growing into the matter of how such learning environments can be used to manage knowledge. The resulting prolifera-

Table 1. Key characteristics of a community of practice. Source: Compiled from Wenger (1998)

Sustained mutual relationships
Shared ways of engaging in doing things together
The rapid flow of information and propagation of innovation
Absence of introductory preambles, as if conversations and
Interactions were merely the continuation of an ongoing process
Very quick setup of a problem to be discussed
Substantial overlap in participants' descriptions of who belongs
Knowing what others know, what they can do, and how they can
Contribute to an enterprise
Mutually defining identities
The ability to assess the appropriateness of actions and products
Specific tools, representations, and other artefacts
Local lore, shared stories, inside jokes, knowing laughter
Jargon and shortcuts to communication as well as the ease of producing new ones
Certain styles recognised as displaying membership
A shared discourse reflecting a certain perspective on the world

tion of online communities associated with such developments in turn suggesting that interest is now centering on how the knowledge dynamics of virtual CoPs differ from those organizations which are dependant on social familiarity and direct engagement (Ellis et.al., 2004; Johnson, 2001).

Two Types of Online Interaction

As Amin and Roberts (2008) acknowledge, there are now two types of online interaction that merit close attention as spaces where CoPs engage in learning and get involved in knowledge generation. Firstly, innovation-seeking projects that can involve a large number of participants and secondly, relatively closed interest groups which face specific problems and are consciously organized as platforms needed for learning about and gaining a knowledge of, how to build the capacity required to include 'distant others' as participants in such projects.

As they say: open source software groups provide a good example of the first CoP. Typically, they involve short-lived projects that make source code freely available to technical experts who are motivated by the challenge of solving a difficult programming problem. Successful projects of this kind are those guided by shared notions of the problem, guided by a core group of highly motivated experts who associate with one another to learn about the subject and transfer the knowledge generated to distant others.

More recently, however, we have seen a rapid rise in the development of the second type of CoP. These are established explicitly by professionals, experts, or lay people to advance knowledge. Typically, they involve experts interested in developing and exchanging best practice, or lay people wishing to learn about and transfer knowledge about and build capacity for such electronically-mediated communication. Here a CoP is seen to emerge once the technologies for the virtual organization is available and success is seen to emerge from the ability such platforms have to transfer knowledge. Furthermore, it is also stressed that with these CoPs the technology which is available to support the development of virtual learning organizations, has to be managed. As Josefsson (2005) points out, such virtual learning organizations are successfully managed in accordance with a 'netiquette', where semantically-rich language is used to develop a culture of engagement replete with humor, empathy, kindness, tact, and support. This way virtual learning organizations are seen to replicate the rich texture of social interaction normally associated with CoPs marked by high levels of inter-personal trust and reciprocity, or collaborations built around strong professional or occupational ties.

Defining Features of the IntelCities CoP

Made up of both open source software groups, experts and lay people, the IntelCities CoP is unique in the sense its network provides an example of a virtual organisation set up to manage the learning needs and knowledge requirements of a technological platform. That virtual organisation set up under the name of the IntelCities Project and as a platform which:

- Offers the means to meet the learning needs, knowledge transfer requirements and capacity building commitments of its integrated eGov services model.
- Meet them in a manner that is socially inclusive and participatory in the way the platform of integrated eGov services under development allows users to learn about the availability of such services, how to access them and the opportunities they offer everyone to become engaged with and get involved in meeting the knowledge transfer requirements and capacity building commitments of their urban regeneration programmes.

There are three features that define the Intelcities CoP and which give it meaning and a sense of purpose. These are: the shared enterprise, the technology and online services. The shared enterprise relates to the work undertaken by all members of the IntelCities CoP to develop an integrated model of eGov services. The technology refers to the open source software underlying the development of the eCity platform upon which the integrated model of eGov services rests and that supports online access to the socially-inclusive and participatory urban regeneration programmes this provides. These defining features of the IntelCities CoP align with nine of the characteristics highlighted by Amin and Roberts (2008) and set out previously in Table 1.

Table 2 underlines the importance of these as characteristics and adds another six that have been exploited by the network to develop a virtual learning organisation capable of bridging the gap which exists between the Type 1 and 2 (innovation-seeking and knowledge generating) classifications of virtual CoPs offered by Amin and Roberts (2008). What follows should like to suggest the extra characteristics are those needed to span the divide between what are in crude terms, the technical and social requirements of the IntelCities CoP.

In line with current definition of CoPs as shared enterprises, the additional features clearly highlight these particular qualities and reflect there importance, but in addition to this they underline

Table 2. Defining characteristics of the IntelCities CoP

sustained mutual relationships
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interactions were merely the continuation of an ongoing process
very quick setup of a problem to be discussed
substantial overlap in participants' descriptions of who belongs
knowing what others know, what they can do, and how they can contribute to an enterprise
a shared discourse reflecting a certain perspective on the world
shared enterprise between research institutes, ICT companies and cities
joint venture commitment to product development
support for the use of ICTs as a means to bridge the digital divide
shared commitment to social-inclusion and participatory urban regeneration programmes to bride such divisions and lose the gap between the information-rich and poor
support for the modernisation of local government service provision using technological platforms
consensus-based decision making, consultative and deliberative in nature

the technical rational and social purpose of the virtual organisation in question. This suggests that in developing integrated eGov service models it is not possible for intelligent cities to develop as either Type 1 or 2 CoPs and this is because the shared enterprise and joint venture characteristics such virtual learning organisations share, means they have to be technical and social in equal measures.

The following examination of the IntelCities CoP shall to a large extent, reflect this position. It shall begin by examining the integrated model of eGov services and IT underlying the eCity platform developed as an intelligent solution to the virtual organisation's learning needs and knowledge transfer requirements. The examination shall then reflect on the search for intelligent city solution in terms of the step-wise logic adopted to meet the challenge the learning needs and knowledge transfer requirements of virtual organisations pose. From here the e-Learning platform, knowledge management system and digital library developed for such purposes shall be outlined. Having done this, attention shall turn to the innovative features of this platform, management system and library and the semantically-interoperable qualities of the learning, knowledge and repository services this offers shall be reviewed. From here the examination turns attention towards a review of how the learning, knowledge management and digital library services now available as eGov services are integrated into the eCity platform and made available over the web.

This turns attention to what is termed the eTopia demonstrator developed to illustrate the functionality of the semantically-rich eGov services in question. This term is borrowed from Mitchell's (2000) account of intelligent cities as e-topias and as organizations that are: 'SMART', lean, mean, green software systems, driven by networked communities which are virtual (see, Deakin and Allwinkle, 2007; Deakin, 2007). Those organizational characteristics which the author would add are built on the learning needs, knowledge management requirements and digital libraries of electronically-enhanced government services that are available on the eCity platform as a pool of integrated eGov services.

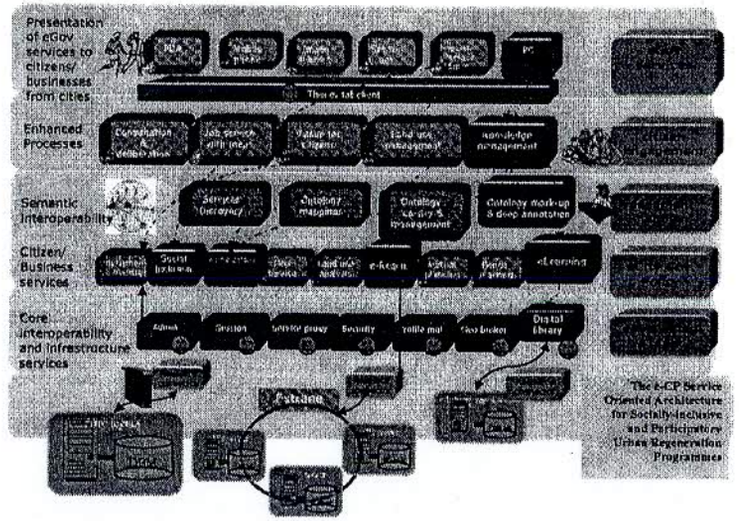
THE INTEGRATED MODEL OF EGOV SERVICES

Figure 1 outlines the integrated eGov services model developed by the CoP. At the front-end there are a range of eGov services under development, highlighted as social inclusion, participation and regeneration and shown in terms of the middleware integrating them between the front-end presentation tier and back-office core interoperability and infrastructure service layer of the eCity platform. This also illustrates the services located in the back-office and the relationship this develops between the organisation's e-Learning platform, KMS and digital library. This shows that it is the middleware of the eCity platform which integrates the front-end delivery of government services to citizens with the back-office business functions. Figure 1 also shows that it is the middleware which in turn provides the opportunity for the e-Learning platform, KMS and digital library making up the back office functions, to do the same and become an integral part of the eCity platform, supporting the pool of eGov services which are available for citizens to access at the front-end. This integration of the e-Learning platform, KMS and digital library into the middleware and use of it as the eCity platform supporting the presentation of eGov services to citizens at the front-end, is the challenge the IntelCities CoP has set out to meet and sought a solution for.

THE IT UNDERLYING THE INTELLIGENT CITY SOLUTION

The main challenge for the IntelCities CoP has been that of finding a solution which has the intel-

Figure 1. Integrated eGov services model



ligence cities need for the information technology (IT) underpinning the presentation of eGov services to be extensible, flexible and also have the capacity to carry existing local government legacy systems. The Services Oriented Architecture (SOA) of the enterprise-wide business model adopted as the joint venture vehicle for such an 'intelligent solution' meets this challenge by offering the IntelCities CoP a distributed, web-based and extendable access system. This intelligence in turn offers cities the opportunity to build a web services enabled platform of eGov services, with XML IT utilisation and SOAP communication.

An important element in the initial system design relates to the use of the Unique Modelling Language (UML) and Rational Unified Process (RUP) methodology used for developing the integrated model of electronically-enhanced government (eGov) services. This allows for the development of complex 'N-tiered' systems and the possibility of cities hosting eGov services on e-Learning platforms, KM systems and digital libraries utilising the intelligence such IT offers. This has the advantage of offering a homogenous platform solution supporting the development of specific service applications meeting the e-learning needs, knowledge transfer requirements and capacity building commitments of the IntelCities CoP. It also manages to do this while leaving open the possibility of sharing services developed by other organisations not yet integrated into the eGov services model and eCity platform supporting this particular organisation's e-learning needs, knowledge transfer requirements and capacity building commitments.

THE SEARCH FOR AN INTELLIGENT SOLUTION

The search for an intelligent solution to the e-Learning needs and KM requirements of the eCity platform has progressed by applying a stepwise logic to the challenge it poses the IntelCities CoP. This has taken the following form:

- A survey of user learning needs.
- Analysis of the knowledge requirements
- Review of learning and knowledge services leading city portals provide.
- Benchmarking of existing e-learning platforms against the user's knowledge transfer and capacity building requirements
- Selecting the e-learning platform able to meet these requirements and develop as a KM system supported by a digital library.
- Integrating the aforesaid into the IntelCities middleware as a platform of eGov services delivered to citizens at the front-end.

Following this step-wise logic has meant focusing attention on the underlying pedagogical issues, the competencies, skills and training requirements of IntelCities. The next step involved a review of the learning services leading city portals offer as legacy systems and benchmarking of the e-learning platforms these systems are based upon against the knowledge transfer and capacity building requirements of the IntelCities CoP. Here the learning services of five leading city portals were reviewed. These included the learning services provided on the city portals of: Edinburgh, Dublin, Glasgow (Drumchapel), Helsinki (Arabianranta and Munala) and Reykjavic (Garoabaer). The review found:

- The said city portals provide learning services for citizens.
- These portals provide citizens with a community grid for learning.
- Much of the data available to the community is informative, telling citizens about learning opportunities in their neighborhoods' and providing links to the service providers.
- While being used by up to 10% of the population and offering free email and storage, most of the services provided by the city portals are insufficiently engaging for citizens to use them as grids for communities to base the development of learning partnerships with cities.

As legacy systems, the review found these e-learning platforms were insufficient to meet the knowledge transfer requirements of the IntelCities and needed to represent the point of departure for the CoP. However, on a more positive note, the review made clear the focus of the IntelCities e-Learning platform should be the needs of the citizen, their knowledge requirements and the technology adopted to deliver this ought to break with the tradition of existing city portals, be more socially-inclusive and offer greater opportunity for communities to participate in their development. With this in mind, the examination went on to benchmark the e-learning systems which existing portals are based on and examine them against the knowledge transfer and capacity building requirements that they set.

THE E-LEARNING PLATFORM

Figure 2 illustrates the results of this benchmarking exercise, presenting the average percentage scores of tools provided by 67 commercial e-learning platforms and compares these against the industry standard (Web CT) & European Dynamics' OSS eOWL system. This benchmarking exercise has in turn produced an OSS (Open Source Standards) approach to e-Learning, where the exercise is driven by a small e and a capital 'L'. This has opened up the opportunity to get beyond the tendency for city learning

Table 3. Results of the e-learning platform benchmarking exercise. Source: Deakin et.al (2004)

Learner tools	Commercial platforms[1]	WebCT	IntelCities platform[2]
Communication Tools	57%	71%	86%
Learning Tools	62%	60%	60%
Learner Involvement Tools	64%	75%	100%
Administration Tools	79%	75%	100%
Course Delivery Tools	72%	80%	100%
Course Design	56%	83%	83%
Hardware/Software	70%	80%	63%
Pricing/Licensing	80%	40%	100%

[1] Indicates average percentage of learner tools covered by the 67 commercial e-Learning platforms surveyed.
[2] Highlights the percentage of functionality of individual learning tool covered by services available on WebCT and European Dynamics' OSS (e-OWL) platform

portals to merely provide links to resources held elsewhere and provided the means to customise an e-Learning platform capable of meeting the particular knowledge transfer requirements of the IntelCities CoP.

The Learning Management System

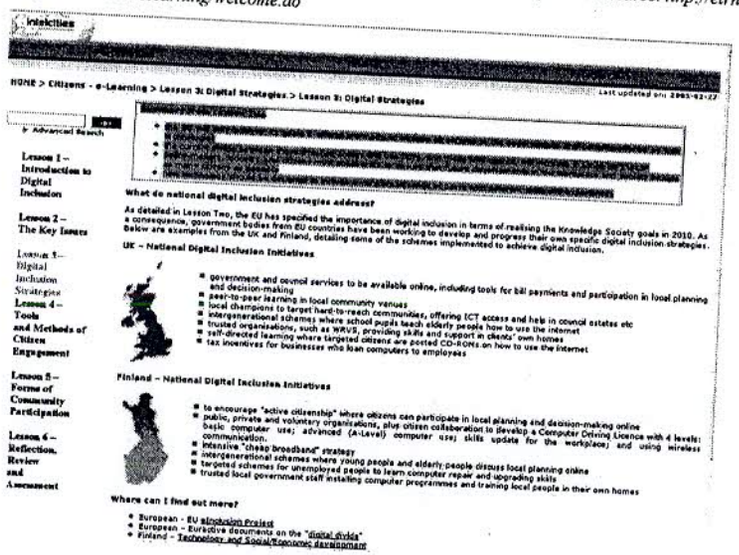
The Learning Management System (LMS) developed for such purposes lies at the centre of the platform. This management system provides the common ground between course tutors, trainers and learners, a virtual space where they can co-operate with one another by sharing experiences and offering personal and confidential advice on the available courses, content and communication tools. It is designed as a set of modules in which tutors can create content, administer the resulting course and create assessments for learners, while learners are able to work with that related material. The services offered by the LMS are underpinned by a set of repositories holding information on personal data of registered members, learner's profiles, material available to support the structured course of studies and other unstructured data also available to learners.

The system architecture rests on three levels, each supported by a dedicated administrator: the platform administrator, the administrator, and the course coordinators, tutors and trainers. Here the administrator is responsible for managing the directory of members registered to a course (this provides the interface between the course provider and the learner), whilst the tutor/trainer will be the course content creator, and the coordinator is responsible for distributing the course(s) to the learner and the services supporting the relating studies. This is supported by core services that provide the learning content, communication, collaboration, assessment and administration of the IntelCities courses (i.e. the learning materials, skill packages and training exercises used for developing socially-inclusive and participatory urban regeneration programmes) which are available to the CoP (see Figure 2).

The E-Learning Materials and Courses

The e-learning materials are made up of three IntelCities courses. The first short course is

Figure 2. Sample of learning material for the Level 1 (lesson 3) eCitizenship course. Source: http://elrn.eurodyn.com/edos/elearning/welcome.do



aimed at members of the public with an interest in becoming more involved in civic life via the use of new technologies. The second course targets administrators within the public sector: those responsible for meeting citizens' expectations, in terms of access to electronically-enhanced eGov services. The third is aimed at policy-makers and strategists within city administrations who want to make their cities leading examples of the digitally-inclusive knowledge society. Together, these three courses make up the CoPs eCitizenship module. Under this heading, the course materials tackle the same core concepts: digital inclusion; citizens' expectations and the means by which cities can meet the needs of their e-ready citizens, whilst enabling access for those currently excluded from the knowledge management systems and digital technologies underlying the public's use of online services. The pitch and tone vary accordingly across the suite of materials, yet each progresses the learner towards an understanding of the tools and methods currently available for cities to use to engage citizens as members of an online community.

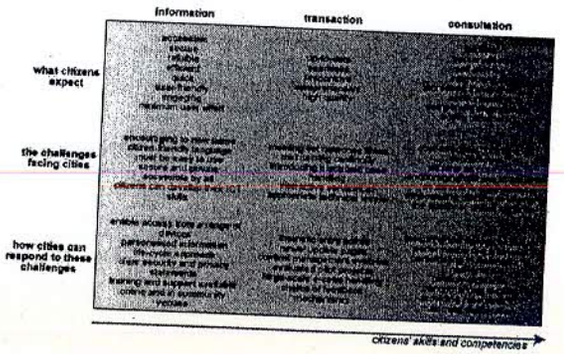
Whilst the short course on digital inclusion provides as set of 'taster' sessions on citizens' engagement with digital technologies, no prior experience of ICTs is needed as a prerequisite for the learning. It is designed to be open to everyone and provide universal access as a bottom line for the learning experiences to follow. Level 2 is targeted at citizens with different levels of

experiential learning and, therefore, abilities. Those collaborating on the development of learning materials for Levels 2 have developed three representative e-service users, each with different levels of familiarity with ICTs. The novice user is characterised as a citizen with little experience in using computers or the internet, but an interest in learning how to find information and pay bills online. The semi-skilled, or intermediate level user is a citizen with regular access to a computer and average to-good ICT skills. At this level of ICT ability, the citizen is interested in locating detailed, up to- date information online and in submitting comments and feedback to the City. The advanced user has frequent access to ICTs and is highly skilled and confident in their ability to interact using the internet. This user wants maximum benefit from new technologies and is keen to interact with the City via services such as online debates and e-petitions.

These three characterisations serve to elicit the relationship between citizens' ICT skills and competencies and the e-services they expect their cities to provide. Figure 3 summarises this relationship. The left-hand column details the expectations of novice ICT users, the challenges these represent and action cities can take in response to them. With little access to ICTs, such as home PCs or 3G mobile phones, the novice ICT user has little confidence in the e-services under development and the potential benefits they offer. In terms of their priorities, citizens at this level prioritise the accessibility of new online services: can they locate them easily. The challenge cities are faced with is that of meeting these very basic requirements without alienating those which have higher skill levels.

As Figure 3 indicates, citizens with minimal ICT skills are unable to make use of cutting-edge, interactive technologies. Digitally-excluded citizens, often amongst the most socially deprived, risk being further for the reason they lack the skills to progress in the workplace and are not members of the online communities, where citizens and their cities consult with one another and meet to deliberate on issues of public concern. By investing in community-based training initiatives and online user support, cities ensure that citizens with little-or-no-ICT experience are offered the chance to develop their skills, be included and

Figure 3. Citizens' skills and competencies. Source: Campbell and Deakin (2005)



participate in more complex inter-active online activities.

Figure 3 identifies citizens at the lowest skill level as seeking engagement at an informational level. Citizens who have progressed beyond basic ICT skills are referred to as seeking engagement at a transactional level. The semi-skilled, or intermediate level, user has better access to ICTs than the novice and is already comfortable accessing basic information and making bill payments online. It also identifies the intermediate user's expectations: for up to-date information of a high quality and the seamless transition between different online services and websites.

As with the novice user, the user at this level requires services that are pitched at the appropriate skill level, again presenting the city with the challenge of meeting the needs of a diverse society. At this 'transactional' level, citizens are interested in establishing online communication with the City and, in order to engage these users and encourage repeated use of these services, cities are required to respond within set times. Electronic case handling is listed in Figure 3 as one method of managing the information flow and building citizens' trust in e-services, as are content management systems to ensure continuity across a range of web pages and services.

Citizens with advanced ICT skills and regular access pose an addition set of challenges to their cities, given their expectations of personalised and intuitive services like those offered in e-commerce. However, citizens at this level of ability are also able to make use of the more complex technologies cities can offer to encourage online consultative and deliberative participation. By engaging increasing numbers of citizens in online dialogue, city administrations harness the knowledge and experiences of local people in order to improve the quality of services they provide.

The Level 3 set of lessons examines the skill bases and competencies of a user who has just such abilities, who expects their city to provide personalised and intuitive services and to make use of the more complex technologies cities can offer to encourage online consultation and deliberative participation. Level 3 provides a set of lessons on how cities can use the skills and competencies their citizens have to make use of these complex technologies and become leading examples of the IntelCities CoP. Two inter-active video lessons have also been produced to support this set of lessons.

The Pedagogy

The pedagogy of the course materials is grounded in the transformational logic of situational learning, very much action-orientated and problem-based in the sense the platform's knowledge transfer capacity is framed in 'structured query language' (SQL) protocols. This can be classified as follows:

- For the basic level of learning and this respective user of the ICTs, it is instructional, providing an outline of the material needed to be informed about them and develop the literacy required for any such communication.
- With the intermediate level of user, the pedagogy is again instructional, but the emphasis here is on the social context of the eCity platform and sets out the skill bases, competencies and training needed for citizens to use the services and engage with others by carrying out online transactions, or by consulting with others as members of a community.
- The pedagogy of the advanced learner is constructivist. Drawing upon the learning of the previous level, this course uses this knowledge as a platform for citizens to use as a means of intervening in decision-making processes, engaging in consultations and deliberating with others to influence the level of government service provision. Here, users of the eCity platform learn how to actively participate as members of an online community that seeks to democratise decision-making and develop the degree of reciprocity which is needed to build trust between citizens and the organisations governing the delivery of services.

Having established the user requirements and found an e-Learning platform to carry them, attention has turned to the development of this into a KM system and digital library supporting the activities of the IntelCities CoP. Developed as back-office functions, attention has subsequently been given to integrating the KM system and digital library into the IntelCities middleware and delivering the resulting pool of eGov services to citizens wanting to learn about them.

THE KNOWLEDGE MANAGEMENT SYSTEM AND DIGITAL LIBRARY

The KMS is organised and grouped according to the requirements of a pre-specified, but evolving, eGov services ontology. The overriding objective of the IntelCities CoP is to provide an e-Learning platform that allows access to a KMS and which is both accessible and usable. This objective has been met by developing the KM system's Document Manager (DM). The DM developed has built the capacity to perform Ontology-based Annotation in Semantic Web for the easy creation, application and use of semantic data. This is particularly important where learners require the KMS to perform a deep and semantically-rich annotation of materials.

The digital library is the electronic repository storing the information available for extraction by the KMS. The rationale for developing the digital library as part of the KM system lies with the potential the DM has to function as a service capable of:

- Capturing, storing, indexing and (re)distributing the learning materials, skill packages and training manuals.
- Extending this to include the formal semantics (metadata, knowledge) for the retrieval and extraction of the said materials, packages and manuals available to support the integrated modelling of eGov services.
- Offering access to the extensive range of products stored as knowledge objects in the digital library and available for extraction by those managing the development of the middleware as a platform for pooling the said eGov services together and extending delivery of them to citizens as front-end users.

SEMANTICALLY-INTEROPERABLE EGOV. SERVICES

Utilising the Semantic Web paradigm, the e-Learning platform is capable of delivering data to its users in a way that enables a more effective 'query-minded' discovery, integration and reuse of the knowledge which can be accessed from the digital library. Through the platform's utilisation of Semantic Web technologies, data uploaded by the KMS (as information available from the system's DM) presents knowledge products corresponding not only to documents (web pages, images, audio clips, etc. as the internet currently does), but more pre-defined objects, such as people, places, organisations and events deposited in the digital library.

Using a pre-defined ontology of this type, the DM allows multiple relations between objects to be created. Currently none of the e-learning platforms forming the basis of the CoP's S.W.O.T. analysis offer such services. Until now it has only been common to see references to the possible convergence of e-learning platforms, KMS and digital libraries. This platform and system gets beyond the call for the convergence of such tech-

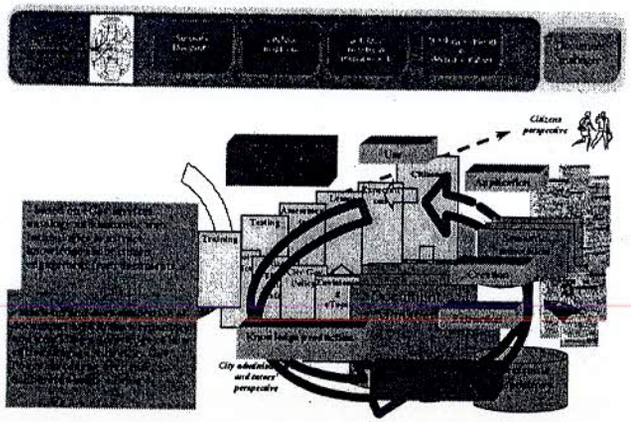
nologies and begins to integrate eGov services with the ICTs available to achieve this. Perhaps most importantly of all, the outcome of all this is an e-Learning platform, KMS and digital library with the embedded intelligence cities need to deliver semantically interoperable eGov services and meet this requirement as a standard measure of the socially-inclusive and participatory urban regeneration programmes the IntelCities CoP has a particular interest in.

INTEGRATION INTO THE ECITY PLATFORM

Figure 4 illustrates how the IntelCities CoP proposes the integration of the e-Learning platform, KMS and digital library should take place and shows the workflow supporting this. This shows the workflow as having its basis in the digital library and KMS of the e-Learning platform. It also shows the workflow between the courses held on the said platform and KMS. Here the system's DM is shown to semantically annotate the learning materials, skill packages and training manuals supporting the courses held on the platform and mark them up in line with the index and classification of the eGov services ontology evolving to manage the knowledge drawn from the digital library.

These back-office functions in turn lead to the creation of the citizen engagement matrix, designed as a semantically-rich grid, allowing communities to be inclusive and actively participate (via consultative and deliberative operations) in the development of the middleware as applications which this platform of eGov services delivers to the front-end. These developments provide the knowledge management toolkit. This term is preferred to "e-Learning platform" because this best captures the contribution the tools: the electronic repository, document manager, semantic annotation and mark-up system, make to the type of knowledge management and digital library services currently found on city portals.

Figure 4. Integration into the eCity platform



While it is recognised this journey from the front-end eGov services to the middleware and towards the back-office functions, represents a significant detour, it is undertaken because the path taken does mark a significant step forward. Not only in terms of the additional learning services that existing city portals are now able to offer, but in 'squaring of the circle' and providing a platform with the intelligence - KMS and digital library - to integrate the front, middle and back-office sections of their organisation as a virtual CoP. As a virtual CoP that in this instance is based on standards which are interoperable across a growing pool of extensible eGov services and have the capacity to support socially-inclusive and participatory urban regeneration programs.

THE 'ETOPIA' DEMONSTRATOR

At present this integration is mainly technical, concerning the software developments needed to host such services and meet with the semantics of the platform's e-learning needs, knowledge transfer requirements and capacity building commitments. This currently takes the form of an 'eTopia' demonstrator, showing 'session-managed logic' how the eCity platform accesses the extensive pool of eGov services located in the back-office and uses the intelligence embedded in the middleware to deliver Level 3 (advanced e-Citizenship) courses on the consultative needs and deliberative requirements of such developments. This provides a 'real time' demonstration' of the platform's capacity to be 'SMART' in developing both the technical and semantically-rich content required for the middleware to begin supporting the socially-inclusive consultations and participatory deliberations of urban regeneration programmes. These enhanced processes of consultation and deliberation also has the advantage of offering citizens multi-channel access to such eGov services, presented to them as socially-inclusive and participatory urban regeneration programmes designed to bring about improvements in the quality of life (Deakin and Allwinkle, 2007). This goes a long way to:

- Uncover the business logic needed to base the intelligence-driven (re)organisation of cities on and standards required to benchmark the performance of the platform against.
- Provide the performance-based measures needed to assess whether any plans cities posses to develop eGov services (over the platform) have the embedded intelligence (the learning, knowledge-based competencies and skills) required to support such actions.
- Also provide the means to evaluate if such planned developments build the (intellectual) capacity – learning, knowledge-based competencies and skills – needed to support such actions.

TESTING THE ETOPIA DEMONSTRATOR

In addition to developing the semantically-interoperable eGov services, the IntelCities' CoP has also sought to evaluate how well they perform as components of the eCity platform. This has meant developing three 'eTopia demonstrator' storylines, where the typical learners referred to previously, use the eCity platform to query the development of urban regeneration programmes by either searching for information on a given initiative, gaining accessing to possible online transactions supporting any such actions, or about getting involved in the consultations and deliberations underlying the governance of such proposals.

The three storylines developed scenarios for:

- Accessing local services in neighbourhoods subject to regeneration.
- Carrying out online transactions related to the use of land.

- Consultations and deliberations about the safety and security issues underlying the governance of urban regeneration programmes.

The storylines aim to fulfil three requirements: first to continue the loosely structured scenarios used to demonstrate the significance of the citizen-led learning agenda developed under the alpha version of the eCity platform; secondly, to integrate this into the back-office business logic of the beta version testing of the eCity platform and thirdly, to establish whether the interoperability resulting from the vertical and horizontal integration of the services is beneficial because it enables urban regeneration programmes to work better in meeting citizens' expectations. The following shall summarise the scenario-based testing of the third and "advanced" level of eCitizenship held on the e-Learning platform and accessed via the KMS.

The exercise began by introducing an 'integrated eGov services scenario' in which two people, Mark and Sarah, are keen to discover what governance services the eCity platform offers for them to learn about how it is possible to become actively involved in initiatives promoted by cities to tackle problems associated with crime in their neighbourhood. The material demonstrates the ways in which Mark and Sarah can use the eCity platform (vis-à-vis, e-Learning platform and KMS) to not only learn about what they can do to tackle crime, but gain a knowledge of how the community's participation in such initiatives can lead to the development of safe and secure neighbourhoods.

The integrated eGov services scenario:

Both Mark and Sarah feel their family and work commitments have prevented them from becoming more involved with local groups in the past. However, both are keen on home computing and have broadband connections to the internet. Mark feels that the City's website should provide information on crime rates and proposes that he and Sarah should logon and initiate a search to see how much they can learn about crime prevention initiatives online. They both want to know what their local administration is currently doing to address neighbourhood issues across the city and to submit their comments on past and present initiatives. They also feel it would be valuable to see what local groups are doing to tackle crime and whether any operate in their neighbourhood. They are also keen to discover how they, as citizens, can use the platform of services available on the city's information portal to ensure the urban regeneration programmes affecting their neighbourhoods are effective in tackling crime and making the areas safe and secure.

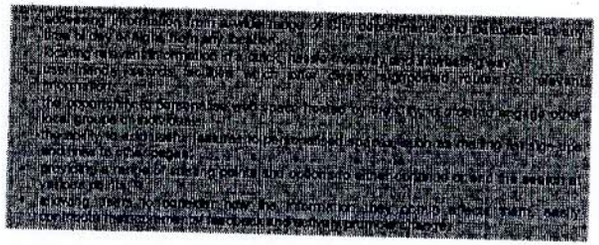
The steps Mark and Sarah can take to use the eCity platform in begin tackling the problems they encounter are set out below, and in Table 4:

As Mark's work frequently takes him to one of the country's larger cities and he has been impressed by local initiatives to address neighbourhood issues, such as a 'Neighbourhood scheme involving local residents'. He's also interested in comparing the crime rates in his neighbourhood with those in other cities and finding which crime-prevention schemes seem to work best.

The information flowchart demonstrates how the eCity platform helps Mark and Sarah to query the developments they have a particular interest in and use this to find the information they need. They are able to access a wide range of data sets from their local administration, such as policy documents and strategies but, most importantly, they are able exploit the potential to use this information to interact with other like minded people as part of a larger group. In this aim, Mark and Sarah can develop a web page and host it on City's learning platform, setting out their concerns about crime and encouraging others to join them as members of an online community discussing how the City

Table 4. Step-wise logic of the service discovery

Table 5. Benefits of the eCity platform



should tackle neighbourhood safety and security issues. As an online community they are also able to compare their City's agenda for tackling crime with those of other administrations and learn about good practice examples from elsewhere. These materials can in turn be used to shape the community's online discussions and enable Mark and Sarah to submit a formal e-petition to those responsible for leading the development of such initiatives. The "one-stop shop" approach of the eCity platform offers them a range of benefits, such as shown in Table 5.

Meeting Citizens' Expectations

The results of this testing exercise are encouraging. Figure 5 demonstrates the responses of the group in quesiton. As this shows, all found the scenarios, steps and information flow to be understandable, in terms of the vocabulary used and also easy to follow. One attendee commented, "I found the material quite open, easy to understand. It made me think more about how I would go about things in the future." As Table 6 also illustrates, most of those participating in the testing exercise found the demonstration to be offer a useful representation of how to learn about the eCity platform's on-line services and use the information this uploads to transfer knowledge about how communities of like minded people can ensure the safety and security measures of urban regeneration programmes work in their interests.

Figure 5. Information flow of the testing scenario

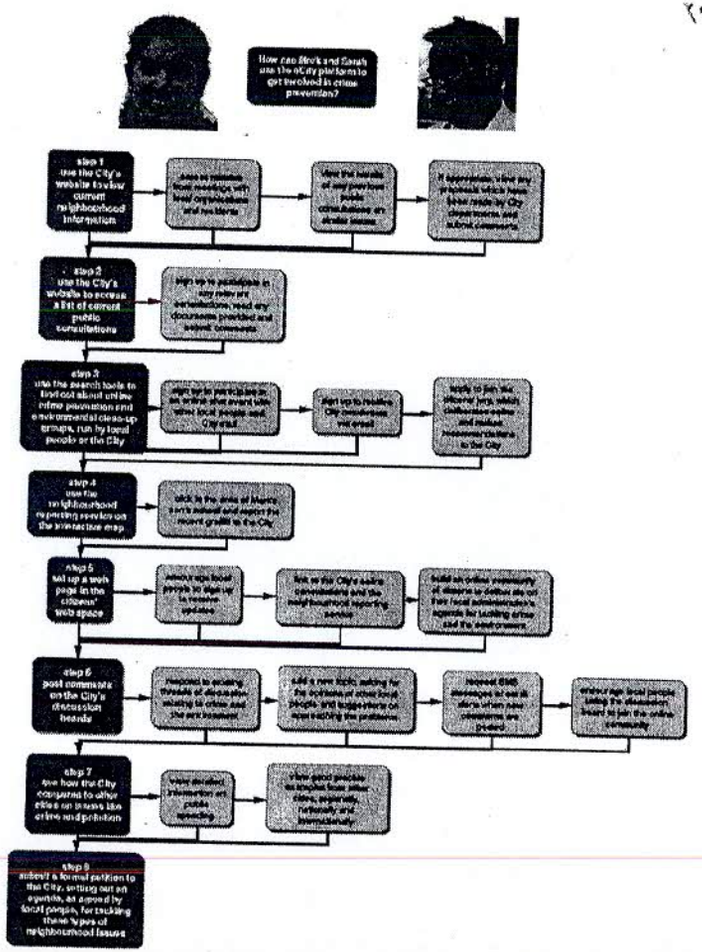
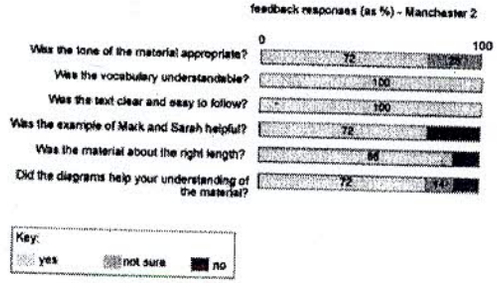


Table 6. Feedback responses to the scenario



SUSTAINING THE DEVELOPMENT OF THE INTELCITIES COP

Table 7 illustrates the research, networking and consorted actions that underlie IntelCities CoP and which have used to sustain the development of this particular virtual learning organization. As can be seen, much of this Research and Technical Development (R&TD) is multi-scalar in nature, covering a range of international, national and regional knowledge domains. The funding for these activities has been and currently still is drawn from EC and UK-based R&TD Programmes. These R&TD actions are complemented by a number of Capacity Building exercises at various scales of intervention. As can be seen, such virtual learning organizations are not self-determining entities and only survive by sourcing the budgets available to finance their development as either research, or capacity building exercise.

As a shared enterprise, the IntelCities CoP operates a match (joint venture) funding business model and draws upon the income this generates to fund the R&TD activities underlying the integration of the e-Learning platform, KMS and digital library's into the middleware of the eGov. Services model. Exploitation of the middleware is organized through and sustained by research institutes and ICT companies negotiating local agreements with cities on how they can best deploy this intelligence as a means to govern the consultation and deliberation services of socially-inclusive and participatory urban regeneration programs.

CONCLUSION

Made up of both open source software groups, experts and lay people, this chapter has argued the IntelCities CoP is unique in the sense the network provides an example of a virtual organization set up to manage the learning needs and knowledge requirements of a technological platform. That which has been set up as a virtual organisation under the name of the IntelCities Project and technological platform that in turn develops the means by which to meet the learning needs, knowledge transfer requirements and capacity building commitments of its eGov services delivery model.

The examination has suggested there are three features that define the Intelcities CoP and which give it a sense of meaning and purpose. These are: the shared enterprise, the technology and online services. The shared enterprise relates to the work undertaken by all members of the IntelCities CoP

Table 7. R&TD, network and concerted action projects

R&TD, Network and Concerted Action projects 1997-2002	R&TD	2003+	Scale	Fund
BEQUEST	IntelCities	LUDA	International	EC E&C
INTELCITY		SusComm	National	UK ESRC
	Capacity Building			
		Deliver	Trans-national	EC Structural
		eBusiness	Inter-regional	EC Inter-reg
		URBan	Regional	EC Structural

to develop an integrated model of eGov services. It has gone on to underline the importance of these as characteristics of the IntelCities CoP and in this aim has added another six qualities that have been exploited by the network to develop a virtual learning organization which is capable of bridging the gap which exists between the type 1 and 2 classifications offered by Amin and Roberts (2008). This has been done in the interests of illustrating how the IntelCity CoP spans the divide between what are in crude terms representative of the technical and social components of virtual organizations. The additional features referred to clearly highlight these qualities and reflect there importance, but in addition to this they also serve to underscore the technical rational and social purpose of the virtual organization in question. This suggests that in developing integrated eGov service models it is not possible for intelligent cities to develop as either type 1 or 2 CoPs because the shared enterprise and joint venture characteristics of such virtual learning organizations means they have to be both technical and social.

The examination has also reported on the intelligent solutions cities are seeking out as a means to meet their e-learning needs, knowledge transfer requirements and capacity building commitments. Having gone on to discuss the technical solutions adopted to integrate the eGov services model with the legacy systems operated by cities involved in this enterprise, attention has turned to the SOA adopted as the business model for the eCity platform. From here the paper has gone on to outline the 'intelligent' solution cities are developing as e-learning platforms for managing the knowledge transfer requirements and capacity building commitments of such organizations.

As has been shown, these developments are valuable because they provide the means to address the criticisms of the learning services currently available on city portals and offer the opportunity for the emerging technologies of the e-Learning platform, KMS and digital libraries, to meet the learning needs, knowledge transfer requirements and capacity building commitments of the IntelCities CoP. This it has been suggested, marks a significant step forward in the development of learning services and offers the opportunity for platforms of this type to develop as a KMS supported by digital libraries. In view of this, the chapter has suggested that if the full significance of these technically-innovations is to be realised, then this integration needs to progress and requires the e-Learning platform, KM system and digital library developed for such purposes, to not only be interoperable across the IntelCities middleware, but all the eGov services which are available to citizens at the front-end. The way in which the IntelCities CoP proposes to achieve this is particularly innovative because the organisation offers a strategy to consolidate the underlying learning aspirations of city portals, but as particular types of eGov services that have previously remained beyond the reach of the platforms developed for such purposes. That is to say, out with the grasp of previous attempts which have been made by such organisations to develop a knowledge-base capable of delivering the consultation and deliberation services key to all this.

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KEY TERMS

Capacity Building: Refers to assistance which is provided to organisations which have a need to develop a certain skill or competence, or a general upgrading of performance ability. Most capacity is built by societies themselves, sometimes in the public, sometimes in the non-governmental and sometimes in the private sector. They are activities which strengthen the knowledge, abilities, skills and behaviour of individuals and improve institutional structures and processes such that an organization can efficiently meet its mission and goals in a sustainable way.

Community of Practice: Groups of people who share a concern or a passion for something they do and learn how to do it better as they regularly interact with one another as knowing subjects.

Digital Library: A library in which collections are stored in digital formats (as opposed to print, microform, or other media) and is accessible by computers. The digital content may be stored locally, or accessed remotely via computer networks. The terms is diffuse enough to be applied to a wide range of collections and organizations, but, to be considered a digital library, an online collection of information must be managed by and made accessible to a community of users. Some web sites can be considered digital libraries, but they may not offer such functionality.

E-Government Services: Internet technologies that act as a platform for exchanging information, providing services and transacting with citizens, businesses, and other arms of government. Such e-Government services include:

- Pushing information over the Internet, e.g: regulatory services, general holidays, public hearing schedules, issue briefs, notifications, etc.
- Two-way communications between the agency and the citizen, a business, or another government agency. In this model, users can engage in dialogue with agencies and post problems, comments, or requests to the agency.
- Conducting transactions, e.g: lodging tax returns, applying for services and grants.
- Governance, e.g: online polling, voting, and campaigning.

The most important anticipated benefits of e-government include improved efficiency, convenience, and better accessibility of public services.

E-Learning: A general term used to refer to a form of learning in which the instructor and student are separated by space or time where the gap between the two is bridged through the use of online technologies. The term is used interchangeably in a wide variety of contexts and can be used to define a specific mode to attend a course or programmes of study where learners rarely, if ever, attend face-to-face contact, or rely upon such direct support.

Knowledge Transfer: The practical problem of transferring knowledge from one part of the organization to another (or all other) parts of the organization. It seeks to organize, create, capture or distribute knowledge and ensure its availability for future users. It is considered to be more than just a communication problem and more complex because:

- Knowledge resides in organizational members, tools, tasks, and their sub-networks.
- Much of the knowledge organizations have is tacit-or hard to articulate in direct communication.

Middleware: The enabling technology. It functions as a piece of software that connects two or more applications, allowing them to exchange data. It is computer software that connects software components or applications. The

software consists of a set of enabling services that allow multiple processes running on one or more machines to interact across a network. This technology evolved to provide for interoperability in support of the move to coherent distributed architectures, which are used most often to support and simplify complex, distributed applications. It is especially integral to modern information technology based on XML, SOAP, Web services, and service-oriented architecture.

Open Source Software: Computer software for which the human-readable source code is made available under a copyright license, or arrangement This permits users to use, change, and improve the software, and to redistribute it in modified or unmodified form. It is often developed in a public, collaborative manner.

Semantic-Interoperability: The ability of two or more systems or components to exchange or harmonize cognate subject vocabularies and/or knowledge organization schemes to be used for the purpose of effective and efficient resource discovery without significant loss of lexical or connotative meaning and without special effort by the user.

Virtual Organisation: A collection of individuals, companies or organisations who have agreed to work together and use the ICTs as the main tools to enable, maintain and sustain member relationships in distributed work environments.

ENDNOTES

1 See http://www.intelcitiesproject.com.

2 While the title of the article by Amin and Roberts (2008) goes under the curios name of "beyond communities of practice", they use the phrase to suggest the need to "get beyond" the "undifferentiated" use of the term and requirement for more "contextualised" studies of the type set out in this chapter.

Definitional Components of the UK Sustainable Communities Plan: The Net Effect of a Realignment and Cross-Sectional Representation of the Development and Design

Mark Deakin, Napier University, UK

Abstract: The UK government proposes that sustainable community plans embody the principles of sustainable development in the sense which they are balanced and integrate the social, environmental and economic development of communities as places with diverse cultures. In this respect, sustainable communities are said to be communities of choice, not fate and places shaped to meet the way people want to live now and in the future. The government also suggests that as communities of choice they develop in a way which is inclusive and participatory, well governed, connected and serviced and for this reason environmentally sensitive. Not only environmentally sensitive, but also economically thriving, qualities that in turn mean their planning leads to the development of places which are well designed and built. Well designed in the sense which they are built in a way that is fair for everyone. The paper shall argue that while this definition of sustainable communities is sufficient to deal with ends, the means available to meet them is very much the matter in hand. Drawing upon a review of previous attempts made to match means to ends, the paper shall go on to suggest the wheels, pulleys and levers which are needed to 'bottom-out' the definitional components of the UK's sustainable community plan, reposition them, lever them into place and gear them up to meet the considerable challenge this poses, requires that we subject the configuration to one more twist. The paper shall also argue, this time around, the twist is very much about the net effect of the socially-inclusive visioning absent from practically all previous representations of sustainable community development. It shall also go on to argue the cross-sectional representation of sustainable community development outlined in the paper, offers the means to carry out such a substantive reworking of the previous configurations. This reworked cross-sectional representation of sustainable community development in turn allowing the previous configurations to be integrated into what shall be termed: the socially-inclusive visioning of a community-based approach to urban regeneration. In particular the socially-inclusive visioning of the planning that underlies the development of the community-based approach to urban regeneration outlined here and design which the step-wise and stage-managed logic of this realignment in turn supports as a way of matching means to ends.

Keywords: Sustainable Communities, Socially-Inclusive Visioning, Community-Based Approaches, Urban Regeneration, Planning, Property Development, Design

Introduction

THE UK GOVERNMENT proposes that sustainable community plans embody the principles of sustainable development in the sense which they are balanced and integrate the social, environmental and economic development of communities as places with diverse cultures. This paper shall argue that while this definition of sustainable communities (SCs) is sufficient to deal with ends, the means available to meet them is very much the matter in hand. Drawing upon a review of previous attempts made to match means to ends, the paper shall go on to suggest the wheels, pulleys and levers which are needed to 'bottom-out' the definitional components of the UK's sustainable community plan, reposition them, lever them into place and gear them up to meet the considerable challenge this poses, requires that we subject the configuration to one more twist.

The paper shall argue; this time around, the twist is very much about the net effect of the socially-inclusive visioning absent from practically all the previous representations of sustainable community development (SCD). It shall also go on to argue the cross-sectional representation of sustainable community development outlined in the paper, offers the means to carry out such a substantive reworking of the previous configurations for the reason it allows them to be integrated into what shall be termed: the socially-inclusive visioning of a community-based approach to urban regeneration. In particular the socially-inclusive visioning of the planning that underlies the development of the community-based approach to urban regeneration outlined here and design which the step-wise and stage-managed logic of this realignment in turn supports as a way of matching means to ends.[1]

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The UK Government's Sustainable Communities Plan

The New Deal for Communities (NDC) is a key programme in the UK government's strategy to tackle area-based deprivation (DETR, 1998). Set up by the Department of Environment, Transport and Rural Affairs (DETR), the NDC aims to bridge the gap between the least and most prosperous areas of England, Wales and Northern Ireland. The partnerships set up to resource the NDC programme are thematic and combat area-deprivation by tackling: poor job prospects; high levels of crime; educational under-achievement; poor health; problems with housing and the physical environment. While the emphasis of the 'New Deal' is very much on combating area-based deprivation and tackling the poverty of social exclusion, the terms of reference for such actions also extend into the environmental and economic exclusion of communities. This is because social, environmental and economic exclusion are understood to challenge the sustainability of such community development programmes.

Putting any reservations about the sustainability of community development to one side, the NDCs is now beginning to reveal valuable lessons about SCD.[2] They suggest the keys to SCD lie with the following: improving local services, increasing community capacity (i.e., enabling people to do more for themselves) and adopting an evidence-based approach towards delivering change (i.e. by getting proof of what works in practice). They suggest the key characteristics of the NDC rest with the programmes:

- long-term commitment to deliver real change;
- ability to put communities at the heart of this, working in partnership with key service providers;
- commitment to community participation;
- stance adopted on joined-up thinking, solutions that are action-based and which rest on evidence about 'what works' and what doesn't.

Towards Sustainable Community Plans

The UK government proposes that sustainable community plans embody the said characteristics in the sense which they are balanced and integrate the social, environmental and economic development of communities as places with diverse cultures. In this respect, SCs are said to be communities of choice, not fate and places shaped to meet the way people want to live now and in the future. The government also suggests that as communities of choice they develop in a way which is inclusive and participatory, well governed, connected and serviced and for this reason environmentally sensitive. Not only environmentally sensitive, but also economically thriving, qualities that in turn mean their planning leads to the development of places which are well designed and built. Well designed in the sense which they are built in a way that is fair for everyone.

The UK government's interest in the subject is extensive and surfaces in the civic renewal, capacity-building, action and skills agenda of the 2003 Sustainable Communities Plan. The particular statement which states that:

> *"Sustainable Communities are places where people want to live and work, now and in the future. They meet the diverse needs of existing and future residents, are sensitive to their environment and contribute to a high quality of life. They are safe and inclusive, well planned, built and run, and offer equality of opportunity and good services for all." (ODPM, 2003, p. 5)*

This working definition of sustainable communities' resurfaces in a number of subsequent statements made about the role of communities in promoting sustainable development found in:

- Kearns and Turok's 2003 *Sustainable Communities: Issues and Perspectives* and their 2004 *Sustainable Communities: Dimensions and Challenges*
- Egan's 2004 *Review of Sustainable Communities*
- the Community and Local Government's (CLG) 2005 *People, Places and Prosperity*
- the ODPM's 2005 *Bristol Accord on Sustainable Communities*
- the Department of Environment, Farming Regional and Rural Affairs' (DEFRA) statement on *The UK Sustainable Development Strategy*

The statement from Kearns and Turok (2003) surfaces from research carried out under the ESRC *Cities: Competitiveness and Cohesion Programme* and summarised as a policy statement on *Sustainable Communities* for the ODPM (2004).[3] These papers examine the concept of SCD and review the available

[1] This paper is drawn from work undertaken by the authors and funded by the UK's ESRC and EPSRC under the respective titles of: Learning from What Works in Sustainable Community Development and as a process of SURegen (Sustainable Urban Regeneration).
[2] These lessons are discussed by Lawless (2004, 2006)
[3] The ODPM now forms part of the UK's CLG and this government department is now solely responsible for the UK's sustainable communities remit.

literature. In these papers SCD is loosely defined and used by Kearns and Turok (2003:4) to:

> *"signify a wider vision of places than has often prevailed in the past, combining [social], environmental and economic dimensions with a recognition of growing interdependencies between different geographical areas and spatial scales of decision-making."*

This bottom-up perspective of SCD is context-specific and set within the multi-scalar logic of their underlying urban and regional structure. This perspective represents the context-specific notion of SCD as the social, environmental and economic components of sustainable communities (SCs) and relationship their development in turn has to the governance, transport & communication and service provision of their respective neighbourhood, city and regional structure(s).

Review of Skills for Sustainable Communities

In 2004 the ODPM subsequently commissioned a review of the skills needed and training required to develop SCs in line with the six-fold representation offered by Kearns and Turok (2003). This examination of SCD culminated in the 2004 Egan *Review of Skills for Sustainable Communities*. This produced the first clear figurative representation of the government's commitment to sustainable communities known as the Egan Wheel. As the first figurative representation of sustainable communities, the 'Wheel' is significant. For it takes the ODPM (2003) and Kearns and Turok (2003) statements on sustainable communities as: well-governed, connected, serviced and so forth and situates them as the definitional components of sustainable communities alongside the social, environmental and economic characteristics which they are understood to share with that of sustainable development. The effect this has is twofold: first of all the resulting configuration illustrates what is currently understood about the social, environmental and economic principles of sustainable development and secondly; the consensus surrounding this multi-disciplinary reading of sustainable development is in turn used as a basis to gain an equivalent social, environmental and economic knowledge of sustainable communities.

Representation

As a learning exercise this works well, focussing attention on the definitional components of sustainable communities and begins the process of building consensus on the relative merits of this representation across government, professional bodies and advisors alike. This is not to say that consensus has been gained on the definitional components of sustainable communities, or there is unanimity on the principles of sustainable development they embody. For this is not the case and to suggest otherwise would run the risk of 'glossing over' what such configurations illustrate about the current state-of-play in the presentation of what might be best referred to as the underlying principles of SCD.

Instead what Egan (2004) has managed to do is to trigger off a number of further configurative representations. The most notable emerges from the Regional Centres of Excellence (RCEs) set up to roll out of the Sustainable Communities plan and skills agenda identified by Egan (2004). That plan accepted by the ODPM (2004), as having a skills agenda which is able to move the sustainable development strategy beyond a vision and on to a programme of implementation.

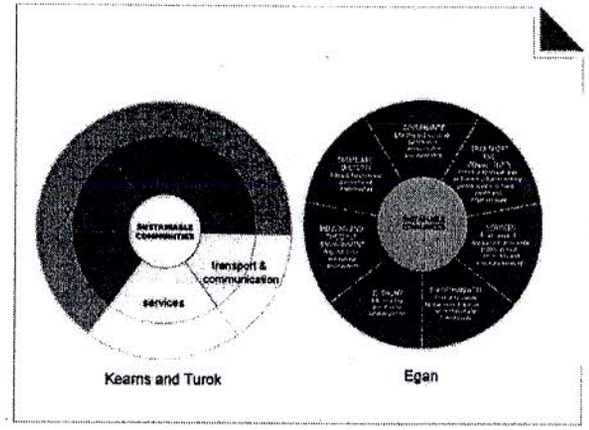

Figure 1: Kearns and Turok (2003) and Egan (2004)

Figure 1 shows the original six and subsequent seven-fold definition of SCs provided by Kearns and Turok (2003) and Egan (2004). As can be seen the noticeable differences between them lies in the positioning of the components in terms of what Kearns and Turok (2003) refer to as the virtuous relationships between them and the decision taken by Egan to sub-divide the environmental component and reclassify it as "built" and "natural".

The remaining representations shown are those offered by the CRE and Brisol Accord Summit on SCD. With these representations two changes to the configuration are noticeable: first the configuration advanced is more complex in the sense it attempts to synthesise the ODPM's (2003) original statement on what defines SCs with Kearn and Turok's (2003) components and Egan's development of this. Second, as a synthesis of the aforesaid, the components they use to define the development of SCs are more extensive. As both a synthesis and extension of the original definitional components, the changes at first sight appear relatively minor and not something warranting undue attention. For what they do is to rework that which has previously been presented by casting back to the original definition provided by the ODPM (2003) and taking this forward as a kind of 'retro-spective' adjustment.

In this way their revised version of the 'Wheel' succeeds in doing two things: first of all highlighting that importance of including the original definitions into any figurative representation and secondly; that there are in fact eight and not seven components of SCs which need to be accounted for. The extra definitional component which the RCE and Bristol Accord's representation of SCs adds back into the Wheel is that of 'equity' (see Figure 2).

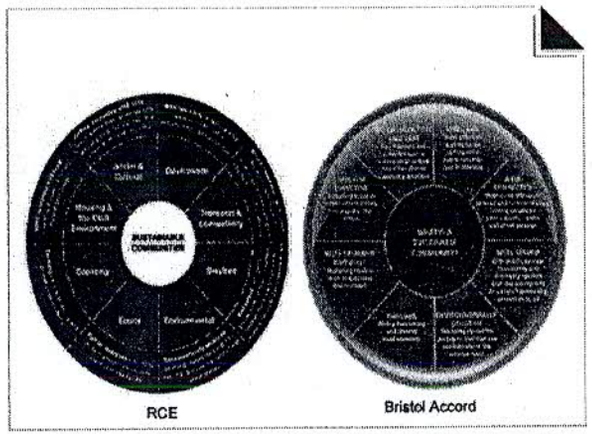

Figure 2: RCE (2005) and the Bristol Accord (2005)

A Simple Clarification?

What these two most recent reworkings of the Wheel by the ECE and Bristol Acoord do is 'offer-up' a simple clarification of the position the ODPM want to see taken on the matter of SCD. This takes the following format. First the question of what are SCs is left at the centre of the configuration, as the core issue lying at the 'heart' of the matter. Then secondly; the inner ring introduced by Egan and extended by the RCE is removed, leaving the previous outer ring of what the government see as those components key in defining whether a community is sustainable or otherwise. This results in the Wheel being left with a series of propositional statements on SCs such as those relating to whether they are safe, if they are inclusive, participatory, well governed and so forth. From the government's point of view this seems preferable because it acts to foreground the performance related content of the components making up what defines SCs. As such this works to refocus attention on what communities need for them to be defined as sustainable and those components required for them to develop such a status.

Not only does this have the effect of drawing attention back to the more textual and narrative-based qualifications lying behind the definition, but the respective nature of the components in question. This in turn having the effect of replacing the equity component lost from the definitions represented in previous configurations and resolving the problems the absence of such a key component cause by repositioning it elsewhere. That is to say by replacing the economy component (represented here by the definition of 'thriving') to its original position and shifting the equity component (again defined as 'fair for everyone') up next to the social (represented here by reference to as 'safe, inclusive and active') component of SCs.

The Net Effect of this Realignment

The net effect of this realignment is clear. For what it does is realign the relationship between equity, environment and the economy. Repositioned here the equity component does offer a useful line of reasoning and the resulting realignment of the relationship between the social, environmental and economic does strengthen the representation of an attribute previously seen as a relatively weak component of the Wheel. However, it should be noted this is only possible because of the Bristol Accord's decision to empty out the means by which this can be developed and to only focus on the ends it can be put to in the development of sustainable communities. So while this repositioning clarifies the ends, it still leaves a number of questions over the means. If anything the tactic which the Bristol Accord adopts can perhaps best be seen as a mirror of that adopted by the professions in the RCE's use of the Wheel to focus on means.

If we accept this representation of ends as being the social (active, inclusive and safe), equity (fair), environmental (well designed and built) and economic (thriving) components of SCD, then a number of questions surface about how we proceed. These are:

- do we adopt the ends as defined in the Bristol Accord and its representation of the definitional components and use these as the basis to develop the appropriate means to match them?
- is the Wheel still the best device to use in matching the said means to ends;
- should any such future understanding be based on a clock-wise or some other alternative approach to the development of sustainable communities.

The answer to the first question has to yes: for the reason the integration of equity into the definition of sustainable communities and what this means is based on a decade of academic research on the principles of sustainable development as applied to communities and consensus-built in policy circles about the value of such representations. This also serves to highlight the challenge this poses for the professions in meeting their strategic responsibilities for overseeing SCD. For it is evident that the Bristol Accords' deliberate decision to leave the means out of their configuration of the Wheel and focus on ends, not only raises questions about how previous representations have dealt with the question of equity, but the whole question of how the means can assembled to meet such ends.

The answer to the second question has to be no for a number of reasons. First of all for the reason, while the Egan Wheel has become the leitmotiv of SCD, it does not function in any such manner. For it neither turns, nor rotates along an axis, so does not move, or carry anything in any discernable direction. So in that sense what is currently put up as a representation of the Egan Wheel is not what is suggests. Nor does it function as the RCE would prefer to see it i.e. as a 'hub and spoke version' of a wheel. For while such a representation has the potential to link the core to the inner and outer ring of the Wheel, the very fact that the core is empty, means it is anything but linked to the content of the inner core and connection this in turn has to the outer ring.

The answer to the third question might well be answered in the form of a riddle: something along the lines of when is a wheel not a wheel? The answer to this being equally confusing, but found in the statement: when it is a circle! For stripped back of all its aspirations, this is what the representation advanced by Egan and developed by he RCE is. It is a circle and not a wheel and segmented not integrated representation of the definitional components making up the sustainability of community development. Looked at in this way, it becomes apparent why a circle represented as a wheel might prove to be controversial and leave the status of what it seeks to represent ambiguous. For built on such a shaky foundation, extended as it has been and then simplified as part of a rationalisation, it should not come as anything of a surprise to learn the attempts made to match means with ends have not been resolved and have only served to heighten the problems experienced. This in turn only serving to expose the critical nature of the challenge they pose any attempt to represent the definitional components of SCD.

The final question as to whether any future understanding should be based on a clock-wise or alternate reading might by now be self-evident. For given it is only via an anti-clockwise reading that any possibility of gaining a strategic understanding of SCD surfaces, this means the potential which this offers has to be exploited. This is because to do otherwise would be tantamount to abandoning the Egan Wheel, RCE adaptation of it and the Bristol Accord's reworking of the material. The best way of avoiding this being to adopt an anti-clockwise reading of the subject as represented in the Bristol Accord.

A Cross-sectional Representation

Figure 3 indicates how this paper proposes to do this. As can be seen it intends to offer a cross-sectional representation of SCD, their definitional content, formal components and means this provides to target ends agreed by professional bodies and the government alike. Figure 3 illustrates the cross-sectional analysis as a kind of 'top-down' relationship, cutting thought the social at the top through sustainable communities and out through to the environment positioned at the bottom. While this is the direction the paper wants to take the analysis, it also proposes to do this using what shall be referred to as the 'pulleys and levers' of SCD. For rather than keeping the social at the top, it proposes to make it the 'bottom-line' by pulling this particular component down from the top to the bottom and strategically repositioning the others (environmental and economic) to sit along side them and positioned in such a way it becomes possible for the community to underlie the clock-wise and real-time logic of the regeneration process supporting the sustainable development of this particular configuration (see Figure 3).

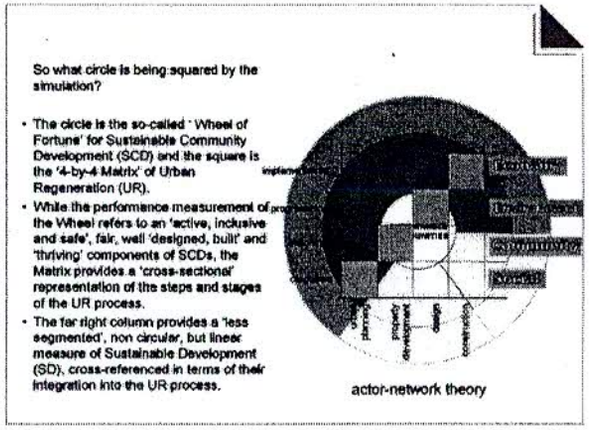

Figure 3: Squaring the Circle

Notes

1. The segments behind the 4 x 4 matrix are those taken from the Bristol Accord statement and reconfigured into a cross-sectional, real-time representation of the 'Wheel'
2. The segments are those of the social, equity, environmental and economy segments, represented here as the 'active, inclusive and safe', 'fair', 'well designed, built' and 'thriving' components of the representation.
3. The circle is squared by means of the step-wise logic and stage managed representation of the urban regeneration process and integration of the social, community, environmental and economic measures of this community-based approach into the urban regeneration process and as part of a SCD.
4. To be clear about what is being squared, all the rings in the circle are being squared. That is to say the outer, inner and core. Under Egan, the CRE and the Bristol Accord, the core ring is presented as the point where the values of all the components converge and provide the qualities to sustain community development. The 'squaring of the circle' taking place in this paper does not continue this line of reasoning and deploys the term: 'a community-based approach to urban regeneration' as the means to replace the core circle with a series of cells. The cells in question are those - reading them diagonally from bottom left, to top right - components defined in this representation as the social, community, environmental and economic and what the diagnosis, visioning, programming and implementation steps of the urban planning, property development, design and construction stages of this regeneration process each contributes to the sustainable development of villages, neighbourhoods and cities. In that sense the step-wise and stage-managed logic of this paper can be said to be founded on a socially-inclusive vision of a community-based and not centred approach. The socially-inclusive visioning of a community-based approach that is inclusive because it offers equal access to life chances and for the reason only this representation makes it possible to be integrative as opposed to and distinct from a more segmented representation of what would otherwise be presented under the name of SCD.
5. This shift from a sustainable community centred to a community-based approach has the advantage of getting underneath questions raised about 'well-designed built environments', making it possible for this representation of sustainable communities to start building consensus over the visioning step of the property development stage and diagnosis step of the collaborative planning stage underlying the 'arch' of this regeneration process. So rather than focussing attention on the architecture of design-led solutions, the representation set out in figure 3 allows for such an examination to study the social equity and ecology of the planning and property development stages of the regeneration process and as those steps supporting the programmes of environmental improvements this in turn makes possible.
6. This redirection from a community-centric design-led approach towards a community approach based on the social equity and ecology of the planning and property development stages of the urban regeneration process and as those diagnostic and visioning steps supporting the programmes of environmental improvements this in turn makes possible, reflects the outcomes of the international debate emerging over what new urbanism contributes to sustainable community development (Grant, 2005, Walters, 2007). This serves to highlight the contributions N. America's HOPE VI Community-Building (Finkel. et.al, 2000), Canada's (Community) Agreement (Smith, 2003), the UK's New Deal for Communities (Lawless, 2004) and Europe's URBAN Community Initiative (Halpern, 2005; Rowe and Taylor, 2005) all make to the debate and growing recognition of the need for the diagnosis and visioning steps of the planning and property development stages to be seen as the pre-requisites of any design-led solutions. Those solutions which underpin such design-led solutions and in turn have the capacity to support the programmes of environmental improvement that cities are responsible for implementing and also learning from as leading examples of what works in sustainable community development. Leading examples of what works when the planning and property development of design-led solutions manage to regenerate urban villages and neighbourhoods as sustainable communities (Deakin and Allwinkle, 2007).

This method of representation is chosen because if we are to match means and ends, only a bottom-up reading of the subject provides the opportunity to do this for it alone offers the type of collaborative framework for building consensus over the substantive content of the as yet somewhat formal definitional components currently available. For as this examination of the Egan, RCE and Bristol Accord representations of SCD has gone a long way to reveal, up till now the tendency has been to move in a direction that empties out the means in the interests of clarifying ends, so any attempt which is made to reverse this trend and match means to ends, itself means a greater amount of substantive content needs to be generated as a requirement of any such realignment of the definitional components. This is the task in hand and quite literally means we have to take one more twist in the configuration of SCs. The twist 'this time around' being not about the repositioning of equity - as it has been in the previously representations - but on what this means in terms of the substantive content any such realignment generates. To be exact: what it means in terms of a distinctively community-based approach to urban regeneration. In that sense the task before us is very much about finding a way of adding back much of the substantive content about the socially-inclusive visioning of a community-based approach to urban regeneration absent from practically all the other representations of SCD offered so far by Kearns and Turok (2003, 2004), Egan (2004), the RCE and Bristol Accord (2005). The cross-sectional representation of SCD outlined in Figure 3, provides the basis for this substantive reworking of the previous representations drawn attention to here and means by which to integrate all of them into what has been referred to as: the socially-inclusive visioning of a community-based approach to urban regeneration.

Conclusions

SCs are said to be places where people want to live now and in the future. It is also suggested that SCs possess these qualities because they are inclusive and participatory. Inclusive and participatory in the sense which they are well governed, connected and serviced and because of this environmentally sensitive. Not only environmentally sensitive, but also economically thriving, qualities that in turn mean their planning leads to the development of places which are well designed and built. Well designed in the sense which they are built in a way that is fair for everyone.

The bottom-up perspective of SCD offered by Kearns and Turok (2003, 2004) is context-specific and set within the multi-scalar logic of their underlying urban and regional structure. This perspective represents the context-specific notion of SCs as the social, environmental and economic components of SCs and relation they in turn have to the governance, transport & communication and service provision of their respective neighbourhood, city and regional structure(s). In 2004 the ODPM subsequently commissioned a review of the skills needed and training required to develop SCs along such lines. This examination of SCD culminated in the Egan (2004) report. This report produced the first clear figurative representation of the government's commitment to SCs and has become known as the Egan Wheel.

As the first figurative representation of SCs, the 'Wheel' is significant. For what it does is to take the ODPM (2003) and Kearns and Turok (2003, 2004) statements on sustainable communities as: well-governed, connected, serviced and so forth and situate these definitional components of SCs alongside the social, environmental and economic characterist-

ics which they are understood to share with that of sustainable development. The effect this has is two-fold: first of all it underlines what is currently understood about the social, environmental and economic principles of sustainable development and secondly; it draws upon the consensus surrounding such a multi-disciplinary reading of sustainable development as a basis to gain an equivalent social, environmental and economic knowledge of SCs.

In terms of the substantive changes to Kearns and Turok's (2003, 2004), Egan's (2004) representation of SCs and both the RCE the Bristol Accord's subsequent (re)positioning of the components, the changes resulting from such a rationalisation of the configuration are quite limited. Looked at from the perspective of Kearns and Turok (2003, 2004), the only substantive change is to substitute equity for governance. This is also the case for both Egan and the RCE's representation and if we take out the whole operational question of 'transport, connectivity and services', the other components also fall into line. This leaving the position represented in the Bristol Accord as the basis for the realignment proposed here. The net effect of this realignment is as follows:

- the substitution of equity relative to governance raises the social significance of SCD and adds weight to the need for means to be deployed capable of meeting this end;
- this adds further weight to what is understood about SCD: that the challenge it poses is strategic and about the social (in)equities of the relationship which communities have to the environment and the economic consequences this has upon their development;
- an acceptance that the skills agenda which underlies this realignment needs to be strategic, capable of understanding the social nature of the relationship and provide professional bodies not only with a knowledge of what this means, but of how to use such intelligence as a platform for SCD. Balancing what falls out of the respective representations and value of what this realignment of the definitional components adds, what is added back must be seen as greater than what is taken out, something that overall has a positive net effect and which is worthwhile working through as part of the search for SCD;
- this shift from a SC centred to a community-based approach has the advantage of getting underneath questions raised about 'well-designed built environments', making it possible for this representation of SCs to start building a consensus over the visioning step of the property development stage and diagnosis step of the collaborative planning stages underlying the 'arch(itecture)' of this regeneration process. So rather than focussing attention on the architecture of design-led solutions, the representation set out by this paper allows for such an examination to study the social equity and ecology of the planning and property development stages underlying the regeneration process and as those steps supporting the programmes of environmental improvements it then becomes possible to implement;
- drawn from an emerging international consensus built around the need for a community-based approach to encompass the diagnosis and visioning steps of planning and property development as pre-requisite stages of design-led solutions, this architecture of the regeneration process also has the capacity to support those programmes of environmental improvement which cities are responsible for implementing and learning from as leading examples of what works in SCD;
- the 'architecture of regeneration' referred to here in turn represents for what is for all intents and purposes, the 'learning curve' and 'knowledge geometry' of SCD.

Putting the aforementioned into effect means the wheels, pulleys and levers which are needed to 'bottom-out' the definitional components of the UK's Sustainable Community Plan, reposition them, pull and lever them into place, requires that we subject the configuration to one more twist. The twist 'this time around' not being about the repositioning of equity - as it has been in previous configurations - but a realignment of the means deployed to meet such ends. This time around the twist in the development of SCs is very much about the net effect of the socially-inclusive visioning absent from practically all previous representations. The cross-sectional representation of SCD outlined here, offers the means to carry out such a substantive reworking of the previous representations. This representation of SCD in turn offering the opportunity to integrate them into what has been termed: the socially-inclusive visioning of a community-based approach to urban regeneration. In particular the socially-inclusive visioning of the planning that underlies the development of a community-based approach to urban regeneration and the design which this in turn supports.

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