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Attracting and retaining knowledge workers in knowledge cities

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Abstract

Purpose – *The paper seeks to investigate ways to attract and retain knowledge workers in a globally successful knowledge city or a city aspiring to become one.*

Design/methodology/approach – *The paper reviews the literature on knowledge work and workers and provides useful recommendations on the fundamentals of how to attract and retain knowledge workers.*

Findings – *The paper sheds light on attracting and retaining knowledge workers that knowledge industries, knowledge based development and knowledge cities relay on.*

Originality/value – *The paper provides an in depth discussion on the concepts of knowledge work, knowledge workers and what these workers want when they are not at work.*

Keywords *Knowledge worker, Creative class, Knowledge based development, Knowledge based urban development, Knowledge city,*

Paper type *Conceptual paper*

Introduction

In a growing knowledge economy talent and creativity are becoming increasingly decisive in shaping economic opportunity and knowledge based urban development. Prosperity now depends less on access to physical resources and more and more on the ability to create economically useful new ideas. In knowledge economy and knowledge based urban development the contribution of knowledge workers or creative class is often mentioned as strategic and valuable (Florida, 2005; Baum et al., 2006). For example the scientific literature on the knowledge economy confirms the new importance of knowledge work and knowledge workers as the engines of growth (Glaeser, 2000; Raspe and van Oort, 2006). The claim that the growth of cities is related to human capital can be dated back to Jacob's (1969) work on the economy of cities. Since then extensive empirical work has confirmed a link between human capital, economic growth and urban development (e.g. Knight, 1995; Eaton and Eckstein, 1997; Black and Henderson, 1999).

The basic idea behind human capital theory is that people, rather than money, are the motor force of economic and social growth and urban development. Human capital is, thus, the major variable in endogenous growth models (Reich, 1992; Saxenian, 1994). The conclusion of such models is that the key to regional growth lies in concentrating a critical core of highly educated and productive people, knowledge workers.

This paper investigates ways to attract and retain knowledge workers in a globally successful knowledge city region or a city that aspires to become a

knowledge city. The paper is organised in five sections. Following the introduction the second section focuses on knowledge workers in the urban context before outlining a portrait of knowledge workers as urban residents when they are not at work. Following this the paper considers the essentials for attracting and retaining knowledge workers in cities. The paper concludes by providing generalised useful suggestions to attract and retain knowledge workers in knowledge cities.

Knowledge workers in urban context

The production of contemporary knowledge requires a certain scale and intensity of knowledge infrastructure. It also requires a certain scale of labour power and consumption. The optimal landscape for the production of contemporary knowledge is a big city embedded in a functional urban region with significant global dimensions. In such a landscape the core city concentrates extensive global networks into an intense medium of exchange in which knowledge production and knowledge workers can thrive. For as much as specialised knowledge must be networked from sources around the globe so knowledge workers prefer inspiring cities with a thriving cultural life, an international orientation and high levels of social and cultural diversity (Van den Berg et al., 2004; Carvalho, 2006).

Knowledge workers are not only highly mobile in theory, they are also highly mobile in practice. That is to say knowledge workers expect to change jobs, if not occupation, relatively frequently. They thus favour knowledge cities and

regions with a 'thick labour market' offering ready opportunity to advance their careers by moving between employers. The benefits of agglomeration have, in short, spread, beyond immediate production, to the employee. According to Florida (2002: 223), "the gathering of people, companies and resources into particular places with particular specialties and capabilities generates efficiencies that power economic growth". In this perspective, social space is becoming the central organising unit of the knowledge economy, taking the place of large corporations.

The city has always been a place of social discrimination. Fundamental to the earliest urban settlements was the division between the palaces of the ruling kings and priests and the places of the common people. Within these socially differentiated places, however, integration was the rule. Thus, mixed together, cheek by jowl, in the popular precincts were domestic spaces, places of work, places of pleasure, places of punishment and places to buy and sell. Over time these different land-uses began to consolidate and segregate. Nevertheless even in European city of the 18th Century integration still held sway. With the industrial development of the 19th Century, however, and the need to organise mass labour in factories, a new and decisive dynamic arose in the spatial organisation of the city. Work spaces separated out from living place and in short, in historic terms, order the negative externalities of mass industry, often pictured in a smoke stack factory, coupled with the development of mass transport, the building of extensive road networks and the long term rise in workers' wages all contributed to the disaggregation of the modern city. By the turn of the 21st Century the contemporary urban

region comprised a disaggregation of dispersed land-uses connected, if at all, by the thin ribbon of linear transport routes. The separation of work, retail and residential activity has had a number of negative consequences ranging from extended home-work and return commutes, unsustainable transport options and the isolation of child-carers in uni-dimensional suburban environments (see Hayden, 1984).

Knowledge work, too, needs mass organisation. Indeed, insofar as knowledge work is produced in global networks the massing of labour in the 21st Century is at a level not seen before in human history. The organisation of knowledge work however occurs in virtual space – in electronic media – thus eroding the need for the spatial consolidation of work. In such a context, a real possibility exists for the re-integration of work place and domestic space. Similarly, insofar as retailing too assumes virtual form (e.g. on-line shopping) a further possibility for the reintegration of modern existence presents itself. In short, the virtual realm that underpins knowledge work appears to present – for knowledge workers if not other social groupings – an opportunity to reverse what has been a fundamental historic urban trend of spatial segregation.

Portrait of knowledge worker as urban resident

What do knowledge workers want – when not at work? The authors attempt to answer this question with an analytical portrait of the ideal knowledge worker. There are, already, a number of snapshots of the subject: as computer adept, scientist, symbolic analyst, financial wizard, writer, artist, and latter-day

Bohemian. These characterisations first place the subject in the context of work; while the final three images start to suggest a life away from employment. The portrait will do both.

The authors start, as required by convention, with a background. In this case human work through the ages suggests itself as a possibility. The social organisation of work, and work is always social before it is individual, has taken many historical forms. Examples include kinship obligation, ancient slavery, servitude, craft production, modern slavery, and industrial wage labour. The last of these is remembered for neither knowledge nor creativity. Rather, the paradigmatic image of what has come to be called industrial modernity is the factory 'hand' functionally chained to an assembly line. In only slight caricature the ideal modern labourer is, therefore, the disembodied hand attending to a machine. As background such a mechanised work environment appears as a uniform surface strangely agitated, as if by the relentless tick of time.

It has been commonly suggested that the knowledge worker is a radically new type of worker, precisely one who is free from machine domination. The organisation of knowledge work, the form of its practice and, most decisively, the role of the human body in the production of contemporary knowledge indicate otherwise. As it has been seen, the subject does not ponder alone under an apple tree or dreaming spire. S/he is part of a team: a rationalised organisation, a network for assembling thought. Such contemporary knowledge production is quite distinct from classic western thought that, the

philosophy of science shows, was built not by aggregation but produced in discontinuous, paradigmatic forms. In addition, contemporary knowledge has a dimension of quantity that marks it off from the classic intellectual concern for quality through brevity (e.g. Occam's razor). Contemporary knowledge, in short, bears the distinct marks of the machine. It is, ideally, a massive articulation (e.g. the genome project). The increasingly digital form of the inputs and outputs of modern knowledge production, dependent on the 0/1 logic of the computer, is also telling. As are the video or machine installations of the artistic avant-garde, the decisive consideration, however, is the role of the human body in knowledge production. If in industrial production the body, as a consequence of the machine, is reduced to a hand, then knowledge work takes the process one step further. It, in essence, requires no bodily act. Body appears as a mere bearer of the Knowing Mind. In this context the figure of Stephen Hawking is iconic – which may explain some of the world's fascination with him. The immediate appearance of knowledge work, like the sun revolving around earth, is, therefore, deceptive. The object of its labour – the idea – is a phantom, an abstraction beyond the material sense of human organs. As such it stands in categorical opposition to the object of industrial labour in all its intractable, too solid mass. Nevertheless, the knowledge worker, as the authors have seen, is not unrelated to the industrial worker, the organisation of modern labour and its consequences for the human body. In knowledge work the marginalisation of the working body approaches completion. This suggests that, although hidden from immediate perception by the virtual dimension of the contemporary work place, the knowledge worker labours in a context of machine hyperactivity. It is against this

rationalised background, empty of human form, and tending toward ideal homogeneity, but of increasing temporal agitation, that the life of the knowledge worker takes place.

The life of the knowledge worker, away from work, constitutes the foreground of the portrait. Here the subject is obligated by the necessities of existence and motivated by the lures of desire. Again, the authors consider them in turn. The most obvious necessities of life are the basic needs of animal existence (e.g. sustenance and shelter). However, insofar as the knowledge worker is not a lone animal but a social being, s/he is also part of a network of social necessities (e.g. family, education, citizenship). Before looking at the detail of some of these 21st Century necessities, the authors pause to consider the processes by which they are provided. In modern society, the necessities of 'social reproduction' are provided, mainly through the market and by public organisations. That said, in the last decades the difference between the two media has narrowed as government has inexorably moved to more market-like mechanisms of allocation. Away from work the knowledge worker, before anything else, lives in the market. Here, surrounded by things for sale, s/he buys the necessities of existence.

Beyond necessity the knowledge worker, like all humans, is driven by desire. Social anthropology and Freudian psychology has found desire (at a societal level often called culture) to be, in essence, compensatory. A successful culture, such as would attract and retain adherents, that is reproduce itself over time, makes good, or more exactly good enough, those things society

requires the individual forgo. There is, then, a contradiction between society that imposes certain disciplines on the individual, and culture which makes good enough these sacrifices. The complexity of humanity, and its ingenuity, has, however, long found ways for the two imperatives to lie down together. Insofar as culture opposes the imperatives of social organisation and the first necessity of society is to organise material production its compensations are, at best, partial or, more often, just ideal/symbolic/virtual (see Levi-Strauss, 1966).

The authors suspect compensation for the sacrifice of the body will be a central desire of knowledge worker culture. Again, however, the authors postpone details of content to first consider the more general question of medium or form. From its beginnings modern culture has been marked by pictorial representation. It is no accident, to mention only the most obvious symptoms, that early modernity discovered linear perspective, that the 19th Century 'invented' photography, and the 20th Century the feature film and television. That is not to say image making does not predate modernity or that it is not more widespread than Europe. However, in contrast to the images of other times and places often sacred images hidden from vulgar eyes modern images are, overwhelming, made for a public – for sale, even. Modernity makes images to be seen by the masses. Only Imperial 'bread and circuses' Rome, itself a market economy, albeit one based on slave labour, readily suggests itself as perhaps comparable in its weakness before the spectacular. Be that as it may, people feel safe in light of the building scale and tempo of

contemporary image making to claim, with no further justification, the imaginary as the cultural medium of the age (see Debord, 1994).

The knowledge worker is in no way immune to the cultural imagery of modernity. Indeed, quite the opposite. Knowledge, an abstraction lacking material form, most readily presents itself to the human mind in ideal spatialisation – that is, as image. From Newton, like Adam, sitting under his apple tree, to Einstein's theory of relativity, constructed precisely around different points of view, to the double helix of life, the age of reason has been wedded to imagery. The authors therefore see the knowledge worker as very much at home in a culture of images.

The structural features of the portrait are now complete. Against a uniform background, agitated by the tick of time and empty of human form, the ideal knowledge worker faces the market as a consumer and looks for images of consolation.

The authors are now ready for the foreground. It is coloured in urban shades for the knowledge worker's home ground, before anything else, is the most modern of environments. Thus, in representing the social necessities of knowledge worker life the authors do so in the context of an intense 21st Century urban environment.

The realm of necessity

The knowledge worker is a particular type of consumer of the market allocated necessities of life. S/he is a consumer with considerable disposal income. The empirical dimension of the spending power of the knowledge worker - a multiple determination of income, capacity for debt etc. – is difficult to isolate from general social data. Nevertheless, the authors confidently suggest the knowledge worker wants a retail rich environment. Policy need only define a hierarchy of retail environments – using, perhaps, retail space, intensity, diversity, proximity – to make this qualitative observation quantitatively useful.

The commodities and services demanded by the knowledge worker consumer are legion. The portrait suggests only the most fundamental. The sort of shelter the knowledge worker wants is the result of a complex economic, social, cultural and personal calculation. Within this complex household structure is a pervasive determinant. The fact that basic data on the knowledge worker households, such as size and form (age, gender, dependent ratio etc.), are not readily reflects a policy and research focus on the mainly economic dimensions of the knowledge work. It is the authors' understanding the knowledge worker household, in caricature, tends toward the ideal of two working adults and a child. Such a structure is unsustainable, there being insufficient children to reproduce the population, raising the already spectral possibility of the machine production of humans (i.e. fertilisation and cloning technology). Be that as it may, the authors' interest here is to represent the knowledge worker household, and its needs, including

the need for accommodation, as more adult than has been the case in the recent suburban past.

The authors also lack basic data on the accommodation preferences of the knowledge worker household. Emerging commentary suggests a significant rental property market – on the understanding of the knowledge worker as mobile not only between jobs but between countries, regions and within cities. Similarly, temporary accommodation for visiting knowledge workers has also been suggested. The authors add two broad suggestions. First, knowledge worker accommodation is likely to require smaller structures, in line with smaller households, than has been the 20th Century norm. On the other hand, such accommodation should make provision for the car – a member, the authors speculate, of the 21st Century knowledge worker household in all but the most unusual circumstance (e.g. Manhattan – but certainly not Los Angeles or Brisbane).

The authors have argued for a knowledge worker household with a decreasing proportion of children. Relative to recent past generations, therefore, the gross burden of child care in the ideal knowledge worker household is diminished. It is also being removed one step away. The knowledge worker household buys much of its childcare in the market. Again, the authors regret the lack of empirical dimension for these speculations. Nevertheless, it is perhaps safe to see, in caricature, the adults of the knowledge worker household leaving their child in another's care as they take their minds off to work. Knowledge workers, in short want access to childcare

services. This want is slowly evolving into a demand for quality child care services. Here public regulation, the Government, enters the picture.

The Government is the major supplier of education – a clear necessity if the household is to be socially reproduced. The demand for education from the child-modest household is for diminished quantity but increased quality. Knowledge workers need access to fewer schools than has been norm, but they want higher quality education for their children. In reverse of the childcare situation, higher income consumers are turning away from the State, and universal provision, and toward selective by income provision by the private sector. This, it should be noted, increases the probability of the generational reproduction of privilege (i.e. social class formation).

A similar dynamic is to be seen at work in health care. The knowledge worker wants care of a higher quality than that provided to the general public, and is prepared to pay for it. In terms of the urban environment, then, the authors speculate the knowledge worker would like ready access to private health care facilities.

The final necessity facing the knowledge worker is age, retirement and death. Significant numbers of knowledge workers born in the baby boom have reached the beginnings of this process. Evidence suggests their material expectations are both greater than their antecedents, and growing. The knowledge worker wants an affluent retirement. In late modern societies the Government has been the traditional provider for life after paid labour – mainly

by way of universal superannuation, and free and/or price discounted services. However, as demand for more affluent retirement has emerged, contemporary Governments have begun to shift from single universal provision to helping individuals accumulate for their own retirement. Again empirical research, this time on the structure and pattern of saving, would be useful. Absent of this speculation, again in slight caricature, is of an ageing knowledge worker who wants Government to provide for the private accumulation of retirement savings. Such provision would include incentives (e.g. tax relief) and protection (e.g. flexibility when worker changes jobs, regions and, even, countries).

The knowledge worker has many other wants. Some of these are so general, for example the desire for national security, they are neglected. Others like transport and personal security, although they could be included here as necessities of social reproduction, are better seen in a cultural context. This ambiguity shows the distinction between social reproduction and cultural desire to be an analytical convenience. In practice the two are mutually implicated in each other – with culture often taking advantage of necessity to give it a particular form; and necessity taking advantage of culture to give it a particular content. They lie down together.

The realm of culture

Contemporary culture is spectacular. Support for this contention is to be seen every night on television, and emphasised at regular intervals by such events as publicly funded fireworks and major athletic games. Within this framework

the knowledge worker desires consolation for the bodily sacrifices of abstract work. If modern knowledge production sacrifices the body of the worker on the altar of the virtual machine, culture pictures that body rewarded, to coin a metaphor, in paradise. From the Renaissance resurrection of classic imagery, through the 19th Century rediscovery of the Olympic Games, to supermodels and gay male display, the cult of the human body has long been an increasingly popular concern of modern culture. Knowledge worker culture is the advanced guard of its contemporary expression. The authors thus suggest, as a prime cultural imperative, the knowledge worker wants to see the perfected human body. The policy implication of this hypothesis is that an environment that can provide such images will attract and retain those who work in abstractions.

The spectacle of professional sport is perhaps the clearest expression of a desire to see the human body displayed in full glory. It is significant that even here success beyond display, the reality of winning in short, is increasingly dependent on patterned disciplines that call to mind humanity in the service of the machine. Be that as it may, watching bodies, in sport or not, is a manifest pleasure of a cultural market that importantly includes knowledge workers. For example in Australia the increasing female interest in the Australian football league, rugby league and even rugby union and cricket, not to mention the Olympic and Commonwealth Games, attests that the display of the perfected body transcends any personal identification with the game. Similarly, male interest in female sport (e.g. beach volley, netball) also suggests a wide ranging aesthetic of the human body. The fact that sexual desire, almost

certainly, underpins such an aesthetic does not undermine the premise. It entrenches it. The authors contend, therefore, the knowledge worker wants the spectacle of professional sport.

If the knowledge worker wants to see human bodies, s/he also wants to be seen as a human body. A central imperative for knowledge worker culture is, therefore, an environment that stages the display of the human body. Cafés spilling onto the pavement, brightly lit arcades, harbour side shopping, walkways down the river, thronging malls, public parks: all so many catwalks and stages for the human body. In this context the authors note the warm climate of Australia, which precludes the bundling of bodies in clothes, is a valuable natural stage property and that night-lighting that illuminates public space is similarly very desirable.

The knowledge worker wants a style of built environment that displays the human body before the public gaze. Such a built environment – and there are many design alternatives – completes the virtual circle of bodily consolation. Successful contemporary urban development allows the human body to be both seen by, and to see, other bodies. Desire arising from a workplace without bodies looks, in short, for dramatic fulfilment. The knowledge worker wants a built environment that looks like so many stage sets. The paradigmatic stage-like stylings of Southern Californian urban development and the eclectic, assembled quality of much post-modern architecture come to mind. The authors can also locate here a cultural enthusiasm for ‘ethnic’ neighbourhoods, for multiple and diversely gendered communities, as so

many exotic settings for recreation – or perhaps, more accurately, for play. Creative people, it appears, desire created places. The contention, in short, is the knowledge worker wants picturesque spaces for human display.

The knowledge worker, who at work is confined in a cubicle before a monitor, moves, ideally, scene by scene, through a recreational environment of display. The mode of transport between places should support this cultural quality. Thus, transport for the knowledge worker when not at work should be provided not only in conventional terms of efficiency, or how rapidly it moves between origin and destination, but in terms of picturesque possibility. In a knowledge worker environment, urban pathways, for walking and cycling, and local public transport that allows the human body to see and be seen are at a premium. In contrast to a transport intensive environment constructed around the rapidity of movement the authors summarise this analysis in the formulation: the knowledge worker wants a transport rich environment.

The desire of the knowledge worker for public display also has consequences for domestic space. The suburban dream was constructed around the private domesticity of the detached house and its fenced garden. It was, and is, an enclosed space hidden from public view. The knowledge worker in contrast wants to see and be seen. In such a culture the role of the abode is reduced. It becomes, in caricature, a second order place made bearable by the electronic import of images from other worlds. The knowledge worker may still value domestic space, but s/he much prefers to eat, to play and to live, in public. It is as if the human body compensates for its lack of presence at work,

with an excess of display in the 'public-home'. It can be argued, the international success of the Big Brother television show is a social index of the power of such desire.

The publicity, as it were, that now surrounds the life of the knowledge worker brings with it anxiety. The knowledge worker in search of an audience must, unlike the stars of reality television, leave the security of suburbia, the private home and the dog, and enter an ambiguous public/private realm. In this realm s/he, like the most famous of fellow travellers, the Hollywood star, wants to be protected from the public at the same time as s/he solicits its gaze. In a culture that turns public space into private stage, the consumer brings the demand that s/he be as safe as if s/he were still in the traditional home. The knowledge worker, in short, wants personal protection in public space. This demand has spawned a contemporary security effort that is distinguished from the past and its protection of property. It culminates in the logic of the gated community.

It is in this light people should see the paradoxical contention that the knowledge worker values 'community'. In a market society individuals with sufficient disposable income do not need other people – they need only shop assistants. Somewhere between friends and shop assistants, the culture of bodily display requires an audience and, even, extras. Such culture values a new sort of 'community' – a community of strangers.

The new spaces between private place and public realm – the space of the community of strangers – appear in the literature as ‘third space’. Such a descriptive understanding leaves the understanding of ‘the home’ unchanged. The authors, on the other hand, see ‘the home’, as it has been used and valued, as of diminished importance for the knowledge worker household. One physical consequence of such diminution is apparent in recent newspaper reports of the impending demise of the ‘Great Australian Backyard’. New developments of detached housing with very limited surround are increasingly common even on the suburban fringe. Certainly, people can anticipate a more intensive domestic form in redeveloped inner city areas, where good design will give some priority to the compensatory provision of a range of ‘third spaces’. Such spaces will privilege adult activity. As such they are not as inherently safe as the antecedent suburban backyard designed for children. Ideally, such space is monitored by the knowledge worker ‘community’ – the members of which need only see one another. Thus, knowledge workers jogging or walking through the neighbourhood, early in the morning or as evening falls, are comforted by the sight of fellow travellers who, while they might be recognised from their routine, need never be spoken to – a community of strangers.

In addition to what can be termed as ‘corporeal consolation’ the knowledge worker seeks one other major cultural recompense. S/he desires that culture make good industry’s ravage of time. It is commonplace that despite industrial modernity’s century old promise of time saving technology, the contemporary

human being is increasingly short of time. The knowledge worker, who coined the language of 24/7, desires real and imaginary compensation for this loss.

As the authors have seen the knowledge worker is not a homebody. Even once settled in a particular city precinct, the knowledge worker travels both widely and often. The friction of travel, however, causes time to tick particularly loudly. The knowledge worker, consequently, is drawn to urban regions that mitigate this effect with a dense network of internal and external transport links. While public transport is desirable, especially if it offers an attractive setting for display (e.g. urban and suburban trains, trams), good road linkage that allows the uninterrupted flow of vehicular traffic through the wider urban region and beyond is essential. Intensive external linkages, especially international air services, are of similar import. In sum, the authors contend the knowledge worker wants a transport intensive environment. There is, of course, a potential conflict between the desire for a transport rich local environment that displays the human body and a wider transport intensive environment, ordered around the efficient movement of people and goods. Design must meet this challenge.

Beyond the desire for a transport intensive environment that will 'save' actual travel time, the knowledge worker also wants some relief from the anxiety of modern temporality. In short, the cultural capital of a knowledge worker precinct should include places where time slows down – if not really then, at least, symbolically. Thus, art, with its imagined timeless human verities, offers significant consolation to many knowledge workers. Indeed, so pervasive is

the provision of static and performance art spaces in the knowledge worker environments of the world they can be considered essential. Similarly, the culture of 'authenticity' displays for human eyes artefacts that stretch back through time and across space, conjuring if not a timeless zone then certainly one where time endures. Time does not tick away; it attaches itself to the authentic thing, it lives in the authentic place. And finally, the cult of history, that seeks to rediscover and preserve the past, likewise constructs an environment rich in a dream time that stretches back to the earliest of eras. In sum, in contrast to the time intensive space of contemporary production, the knowledge worker wants places rich in time.

Essentials for attracting and retaining knowledge workers

This section discusses the essential aspects for attracting and retaining knowledge workers to a knowledge city. The types of factors considered can be wide ranging and include the city's knowledge base, its economic base, the level of accessibility and quality of life, the level of urban diversity and urban scale and questions regarding social equity. Here the authors discuss these under four broad headings.

Quality of life

The quality of urban life is of vital importance to a knowledge region (Florida, 2002). Van den Berg et al. (2004) have found such quality increasingly reflected in the location decisions of workers and firms. Quality of life, the 'liveability of a region, is commonly expressed in an index that includes such

factors as the standard and variety of amenities, education and community facilities, climate, environmental quality, housing affordability, crime level, and transportation access. Similarly, the leisure and cultural possibilities of a region are also of growing significance for mental workers (Van den Berg et al., 2004; Yigitcanlar, 2005). All of which is not to say more traditional considerations such as the quantity, quality, and price of housing, housing affordability, are not also key in attracting knowledge workers (Berry, 2005; Bontje and Musterd, 2005). Knowledge workers, it would appear, want it all.

Urban diversity

Urban diversity, the most significant dimensions being ethnicity, gender, nationality, sexual orientation, is important to knowledge workers. The range of such diversity spans the person (e.g. gender), the community (e.g. ethnicity) and the place (e.g. the architecture of the urban fabric) (see Van den Berg et al., 2004). Diversity, in the best of all possible worlds, is expressed in a cosmopolitanism atmosphere, accepting of strangers and with open channels for the communication/exchange of knowledge (Florida, 2002). On the other hand, of course, diversity can breed social tension and conflict; usually between the resident culture and an unaccepted and/or unaccepting ethnic minority (Carvalho, 2006).

Social equity

Social equity, some have argued, is a key dimension of sustainable urban economic growth. The 3Es of Ecology, Economy and Equity have been proposed as the triple hinge of sustainable development (EEA, 1997). For

developed industrialised countries, deindustrialisation has been accompanied by growing unemployment, especially among young men. The young, under-educated, unemployed, alienated male is the negative role model of the 21st Century city (Hall and Pfeiffer, 2000). The tendency of contemporary economic growth to increase the gap between social classes is leading to the emergence of a dual economy of knowledge workers and a growing underclass, often of ethnic minorities (Carvalho, 2006). The resultant social tensions and conflicts, expressed, for example, as social exclusion and unemployment, discourage both knowledge workers and investing firms away from a region of perceived social danger (Van den Berg et al., 2004). From the perspective of sustainable growth, therefore, it is important to reduce poverty and inequality. Policy that supports the 'up-skilling' of local people and businesses is, some have argued, an important issue for city governments of prospective knowledge cities.

Quality of place

Richard Florida (2002) has suggested replacing the concept of 'quality of life' with that of 'quality of place'. He finds the former too vague and prefers the stronger material focus of the concept 'quality of place'. This underlines the importance of place for Florida. His concept of creative capital includes a dimension of place necessary not only to attract knowledge workers but to keep them productive.

Quality of place refers to the unique set of characteristics that define a place, making it attractive and liveable. For Florida the set of desirable amenities

include parks, bike trails, cultural amenities, such as museums and art galleries, a rich variety of cafés and restaurants, a vibrant nightlife, and a diverse and tolerant population. From these amenities he derives three major dimensions of quality of place:

- What's there: the combination of the built environment and the natural environment – a proper setting for the living of creative lives;
- Who's there: diverse kinds of people, interacting and providing cues that anyone will be accepted and can make a life in the communities;
- What's going on: the vibrancy of street life, café culture, arts, music and people engaging in outdoor activities (Florida, 2002: 231 – 232).

Clark (2003), in his paper 'Urban amenities: lakes, operas, and juice bars do they drive development', distinguishes two fundamental types of amenity, namely, 'natural' and 'constructed' amenity.

- Natural amenities: climate, lack of humidity, moderate temperature, water access (i.e. waterfronts), topographic variation,
- Constructed amenities: sidewalk cafes, tattoo/piercing studios, meditation/yoga, coffee houses, bookstores, movie theatres, liberal arts, universities, opera, dance studios, juice bars, bike lanes and trails, gourmet restaurants, research libraries.

Clark uses his distinction to explore differences in desire between the constituent strata of knowledge workers. He argues, for example, that the

demand of young college graduates is weighted in favour of constructed amenity, while older knowledge workers prefer a greater balance between the two amenity types. He also found his typology useful in characterising the preferences of different ethnic communities and new immigrants groups.

Scale of impact has also been used to distinguish between urban amenities. The most commonly suggested metric is a binary distinction between city-wide amenity and community amenity (see Llewelyn, 2006).

Conclusions

The new growth theory establishes that human capital accumulation embodied in knowledge workers is essential for sustained growth and economic development of a city. Policy makers have therefore become increasingly concerned about attracting and retaining knowledge workers in their cities. The literature indicates that one of the most effective ways to attract knowledge workers and promote economic development is the creation of amenities (Mathur and Stein, 2005: 265).

Following on from the above statement, in this paper the authors have attempted to portray the type of urban region and environment most attractive to the knowledge worker. The authors consolidate the findings in two listings. The first records the more detailed of the derivations. The knowledge worker wants:

- a retail rich environment
- the spectacle of professional sport/music
- quality childcare services
- private school education for the household children
- access to private health care facilities
- static and performance art spaces
- 'authentic' and 'historical' places
- affordable housing, particular for PhD students, post-docs
- an affluent retirement.

The second listing consists of more structural conclusions. The knowledge worker wants:

- an intense 21st Century urban environment
- to see the perfected human body
- picturesque spaces for human display
- to be part of a new community of strangers – defined by aggregation in action
- a transport rich environment
- places rich in time.

In summary, knowledge cities and cities aspiring to become knowledge cities that are capable of addressing abovementioned desires of knowledge workers would likely be successful in attracting and retaining them.

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