Institution: University College London

Unit of Assessment: 19 – Business and Management Studies

Title of case study: Development and deployment of a Spatial Decision Support System (SDSS) for inward investors to London

1. Summary of the impact (indicative maximum 100 words)

The development of a decision support system in close partnership with London's Inward Investment agency (Think London) enabled the latter to win strategic high-value and competitive inward investment projects to the city. The technologies developed played a key role in building the business case for London as a destination for inward investors and were estimated to have contributed towards 45% of 600+ successful completions, leading to the creation or retention of over 18,000 new jobs and the contribution of £2 billion to London's economy. Among the hundreds of successful outcomes was the establishment of Microsoft's Search Technology Centre in London.

2. Underpinning research (indicative maximum 500 words)

As one of the leading 'world cities', London is particularly reliant on sources of foreign direct investment (FDI). In the face of increasing global competition and a difficult economic climate, London must continue to compete to attract and support such investors. Through collaborative research undertaken between 2004 and 2010 with London's official FDI promotion agency (then called Think London), this project addressed the need for a coherent framework for data, methodologies and tools to inform business location decisions and hence deliver relevant support to inbound organisations.

The underpinning research was developed over a six-year relationship supported by Think London through their sponsorship of a Knowledge Transfer (KT) Partnership (2004–2007) and a part-time EPSRC EngD (2005–2011) at the Department of Management Science & Innovation and its predecessor, the UCL Centre for Enterprise and Management of Innovation. The project was led by Dr David Chapman (researcher at UCL since 1985), working with Patrick Weber (KT Associate and later EngD candidate) and led to the creation of an innovative Spatial Decision Support System (SDSS) to support the complex, multi-criteria, decision-making processes of inbound investors.

This SDSS provided a range of interfaces to enable both investors and Think London staff to interrogate key dimensions of London's complex polycentric business landscape, including established business clusters, commuting catchments and workforce characteristics, property stock availability and costs, 'socio-economic' and 'quality of life' indicators, and accessibility to major transport hubs. Data inputs draw upon more than 50 variables relevant to the FDI location decision-making process that were aggregated to service areas around sub-regional economic areas defined by previous UCL "town centres" research. Data reduction and aggregation through principal component analysis was used to reduce these to a more parsimonious model of the key characteristics to enable meaningful characterisation and comparison of target neighbourhoods [a].

In order to enable these data to be rendered, analysed and ranked in the context of specific location decision-making enquiries, the research provided a range of interfaces to support different queries at a range of different levels of sophistication, ranging from 'where are' to 'what if'. Such provision necessitated the development of novel neighbourhood classifications to divide the capital in meaningful socio-economic units before developing profiles for each region that enable investors to make meaningful comparisons [b].

For more complex analyses, the EngD project based on this research developed a sophisticated decision support suite based upon the Analytical Hierarchical Process (AHP). This enables end users to implement complex multi-criteria analyses and decision ranking through trade-offs between criteria to develop sector and customer specific profiles that captured the relative

importance of key components within the decision space.

3. References to the research (indicative maximum of six references)

[a] Chapman, D. P. and Weber, P. (2011). Location intelligence: An innovative approach to business location decision-making. *Transactions in Geographic Information Systems (GIS), 15*, 309–328. DOI: 10.1111/j.1467-9671.2011.01253.x

[b] Weber, P. and Chapman, D. (2009). Investing in geography: a GIS to support inward investment. *Computers, Environment and Urban Systems, 33*, 1–14. DOI: 10.1016/j.compenvurbsys.2008.11.001

The publications listed above were in rigorously peer-reviewed journals. They emerged from the following KTP and a part-time Engineering Doctorate (2005–2011) sponsored by Think London. The KTP end-of-grant report received a grading of 'A' (Outstanding).

KTP partnership KTP000525.
Partnership Aims: To develop an in-house GIS capability to complement existing data analysis strategies and provide more effective marketing and support to inward investors in London.
Grant Holder: David Chapman, Management Science and Innovation, UCL
Total value: £110,528
Duration: 2004–2007
Industrial partner: Think London
Partner contribution: 40% (£35,600)

4. Details of the impact (indicative maximum 750 words)

The interdisciplinary research described in section 2 coupled management- and decision-science expertise with GIS technology to develop tools for London's inward investment agency, Think London. As a result, the agency was able to offer its clients across the world enhanced location analysis to support business needs, to help make a stronger business case and to facilitate relocation to London. For example, a technology company may require a location which is close to major research universities, has good transportation links with North America, and offers a cultural environment which is attractive to the young urban professionals it seeks to hire. The tool developed at UCL sifted through these, and dozens of other factors a company would take into account, to provide profiles of suitable locations.

The business location decision support tools which emerged from the research were used to develop three services, provided to Think London:

- A spatial database that captured the key dimensions of London's business landscape, which enabled Think London analysts to provide customised advice to businesses seeking to relocate to London. This was accompanied by UCL-training for all Think London Business Development staff members in the effective use of this tool.
- Customised business location data generated for key clients. As a special service for major Think London clients, UCL trained members of the marketing team on the spatial analysis techniques required to generate highly customised spatial analyses and reporting.
- Development of a web-based tool for end-users. Following the success of the original KTP, Think London co-sponsored an EngD for the KT Associate to expand the decision-making tool and bring a version of it online for remote users to access business location data without going through Think London.

Economic benefits and job creation

Prior to the merger of all inward investment functions into London & Partners in 2011, the tools and techniques developed in this research formed an essential part of Think London's services to potential businesses considering investment in London. From 2006–2011 they played a significant role in developing the business case to support many of the 600+ inward investors attracted and hence contributing to the creation of more than 18,000 jobs created [1]. Even in the midst of the

economic downturn, London retained its place as Europe's number one business location, facilitated by the services provided by Think London and London & Partners [2].

Representative cases that specifically cite the value of such analyses in support of business relocation and/or inward investment decisions are described below.

In June 2008, Microsoft announced its intention of opening a European centre to invest aggressively in the search and advertising market through its new product, the Bing search engine [3]. In choosing a location for Microsoft's European Search Technology Centre, Jordi Ribas (General Manager) stated: "It is critical for an organisation like ours to be able to tap into the best talent – and Think London worked with us from the very start to help us find it" [4, p.26]. In January 2009, the centre opened in Central London, and became Microsoft's largest research and development centre on search in Europe. This subsequently became a locus for innovation in developing the Bing search engine; for instance, in May 2013, the release of its innovative 'People Autosuggest' tool developed in London, which helps narrow down searches for individuals [5].

Samvo Group, an entertainment and gambling company, was seeking to open its first retail outlets in London following an innovative new 'café' model seeking to attract younger and more affluent customers. Tapping on Think London's 'latest research on location and talent clusters' [6, p.14], Samvo opened two retail outlets in Camden and Hammersmith in 2011, of which the latter was awarded an industry design award [7].

In the midst of an economic downturn, the tools developed at UCL also helped to prevent business flight from London. In 2008-09, for example, KDDI Europe, a telecoms inward investor from Japan with headquarters in London since 1972, was considering moving. As its director stated in a Think London annual report, "We were evaluating our European locations and one potential option was to move out of London. Think London's intelligence and bespoke mapping technology created a convincing case for staying in the City" [4, p.26]. As a result, KDDI opened a new base in east London which was both more affordable and close to its client base, retaining 92 jobs which would otherwise have been lost, and expected to hire 28 new staff members in the following three years [4].

Supporting Think London's investment goals for the London Olympics

Think London was mandated by the Mayor of London and the London Olympics Committee to generate 100,000 additional jobs over a 10-year period. Think London's strategy was to emphasise the business opportunities immediately around the Olympics, and the potential for growth even after 2012, and provide the business intelligence and support to apply for Olympics contracts. Given the dispersed Games sites and the investment opportunities across the city which were available, expert and accessible location analysis was an important part of this strategy.

The web tool developed by UCL was an intrinsic part of the London Business Intelligence Dashboard, launched in 2007, which provided an interface to a wide range of data to support investment decisions [8, p.14]. This in turn was a significant component of Think London's Route to 2012 business road shows. Starting from 2007, Think London used a London cab fitted with the Business Intelligence Dashboard as an iconic symbol of the city and its business offering. This travelled across the US and Europe, and a Mandarin version was launched to coincide with the Beijing Olympics in 2008 [9]. In 2009-10 alone, the road show moved between 13 North American cities [6, p.12]. By 2010, these efforts had already led to the creation of 2,400 jobs in London [6, p.13].

5. Sources to corroborate the impact (indicative maximum of 10 references)

[1] Contribution of decision support system to Think London offering: statement provided by the then Chief Operating Officer, Think London.

[2] Imagine your business in London. Promotional slideshow presented by London & Partners. http://www.londonandpartners.com/business/why-london/imagine.

[3] Microsoft announcement to open search centre, with 'several European cities' considered as hubs. June 2008. http://www.microsoft.com/en-us/news/press/2008/jun08/06-17searchtechcenterpr.aspx.

[4] Think London: A Year in Review 2008–2009. Available on request.

[5] Microsoft press release, 13 May 2013, announcing development of People Autosuggest by its London search technology centre: http://www.bing.com/blogs/site_blogs/b/search/archive/2013/05/13/understand-more-with-people-autosuggest.aspx.

[6] Think London: Working Through Smarter Collaboration: A Year In Review 2009–2010. Available on request.

[7] Samvo betting cafés open in Hammersmith and Camden. http://www.sis.tv/sis-blog/samvo-way-new-look-high-street.

[8] Use of Business Dashboard: Think London: A Year in the Life of Think London 2007–2008. Available on request.

[9] Description, with images, by the Digital Media Consultant used by Think London: http://portfolio.brendanmitchell.com/?portfolio=tl-taxi.