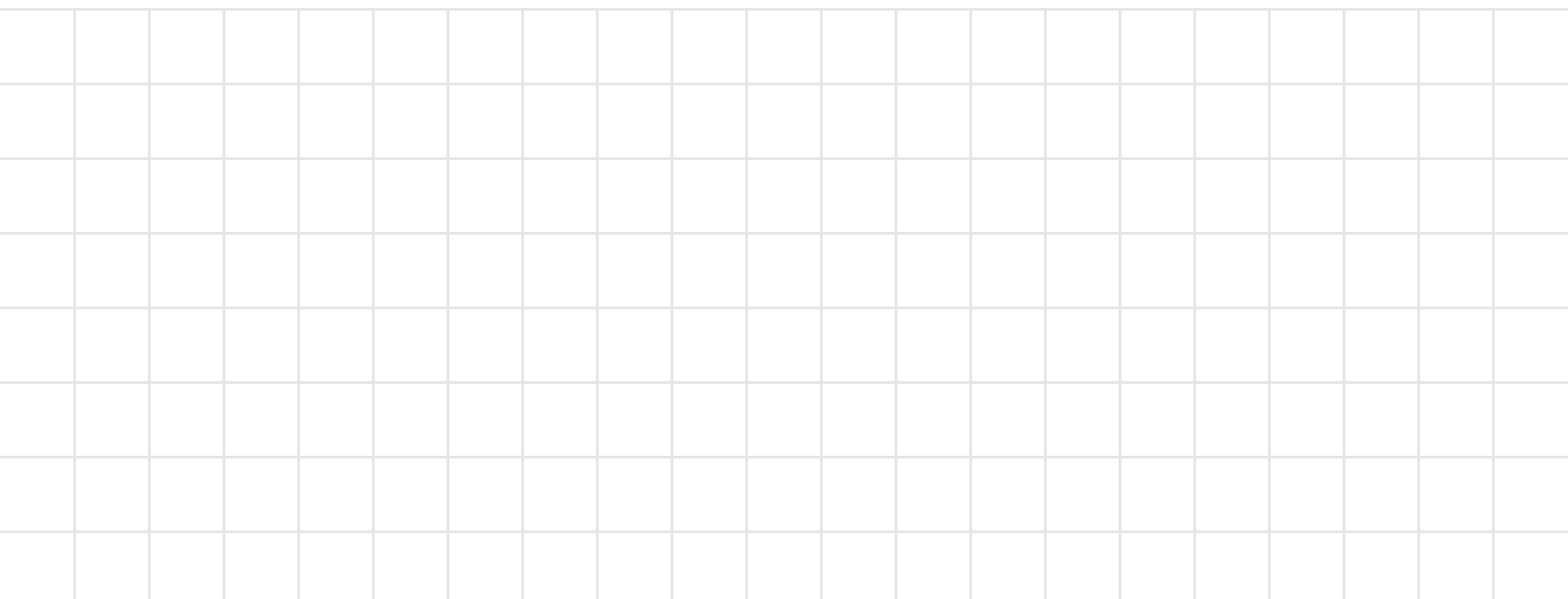


# Geographic Business Intelligence





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## Executive Summary

Business-enhancing technology is ubiquitous today. CRM, ERP, BI systems and more can be found in every major enterprise around the world as a matter of course. In this levelled playing field – where every business has access to the same tools as the next – organisations need to make their technology work harder if they are to gain competitive advantage.

### **Geography has the power to make your business more competitive.**

Traditional IT systems work in rows and columns. They analyse figures: dates, times, quantities and rates. This is valuable data, but it's only a 2D view – and only half of the story.

Add geography to the mix, and you can unlock a hidden reservoir of intelligence that lies within this data. This is because customers, workforces, assets, resources, vehicles, depots, branches, suppliers... all of these have a geographic location. Harness and analyse this, and you can efficiently optimise marketing plans, sales strategies, service delivery, distribution routes, asset management, workforce locations and much more besides.

This is the power of **Geographic Business Intelligence.**

### **The geographic opportunity**

You may not be aware that geography can do this. But it is already widely used – from petroleum to publishing, utilities to retail, and government to financial services.

This paper will show how household names such as RSA, The Co-operative, Manchester Airport and Levi Strauss are using location-based data to boost competitive edge and lower costs across the board. It will explain how the power of geography is enabling them to reduce their environmental impact and mitigate their operational risk.

And it will show you where and how you too can apply Geographic Business Intelligence to your organisation.

## How it works

Effective processes must be in place to manage a large business. That's why companies of a certain size typically turn to Business Intelligence (BI) systems, in order to harvest and interrogate their data for more effective company management.

Yet traditional BI systems fail to recognise the importance of location.

Almost every data item will contain location information that can be better leveraged using spatial GIS technologies. The recent growth in the use of GPS technology in cars, phones and satellite navigation systems, means the amount of location information is growing. Just as a customer name, a product code or an invoice number can be used as a unique identifier to drive business processes or analysed to provide business insights, so too can location data such as an address, a geographic coordinate or a vehicle location be visualised to show connections or patterns in information. This helps organisations increase the effectiveness of their operational processes and make better informed decisions.

By harnessing and analysing location data with GIS, businesses find they can optimise marketing plans, sharpen sales strategies, streamline service delivery, shorten distribution routes, improve asset management, and enhance resource utilisation.

### Linking information together

Where are your customers and potential customers? How do they behave? What are they buying? Could your marketing team segment, target and position them for maximum revenue and profit – and understand all the variables that determine complex behaviour? Could your operations and

### Geographic Information Systems: the enabling technology for enhanced Business Intelligence

The key to unlocking the power of Geographic Business Intelligence is to integrate Geographic Information Systems (GIS) technology into your business.

A GIS is a system for the management, analysis and visualisation of geographic knowledge. The real world is modelled as a series of layers within a spatially enabled database or geodatabase. The GIS also enables other related attributes to be associated and modelled. These attributes may be as diverse as revenue, territories or property boundaries. The relationships which are established can be visualised as maps or more conventionally as charts or tables. Today, it is even possible to model dynamic complex business work flows.

Simply put a GIS combines and visualises layers of information related to location to provide a better understanding of causality and interrelationships. What layers of information you combine depends on your purpose.

A GIS can produce information that answers specific questions and allows you to share that information with others. By visualising relationships, connections, and patterns in data, you can make informed decisions and increase efficiency throughout your organisation.

distribution teams deliver your products or services using more efficient routes?

And when it comes to planning, which location is best for that new office, branch or warehouse? Conversely, if you could manage your workforce and assets smarter and more cost effectively would it be possible to reduce your overheads?

By adding geography to Business Intelligence, new strategic insight

can be gained. Not only that, but previously unthinkable questions can be posed. With location as the context, businesses can 'step back and see the big picture', identifying patterns and trends, modelling 'what if' scenarios, and gaining greater intelligence from their business data in both the short and long term.

Geography is, quite simply, the missing link in Business Intelligence.

## The Geographic Value Chain

In his 1985 best-seller, *Competitive Advantage: Creating and Sustaining Superior Performance*, Michael Porter first introduced the now well-established idea of a value chain.

Below is an adaptation of Porter's classic value chain. By putting geography at the heart of business intelligence, it enables truly joined-up analysis of business performance, risk and environmental issues and ultimately driving forward business strategy.

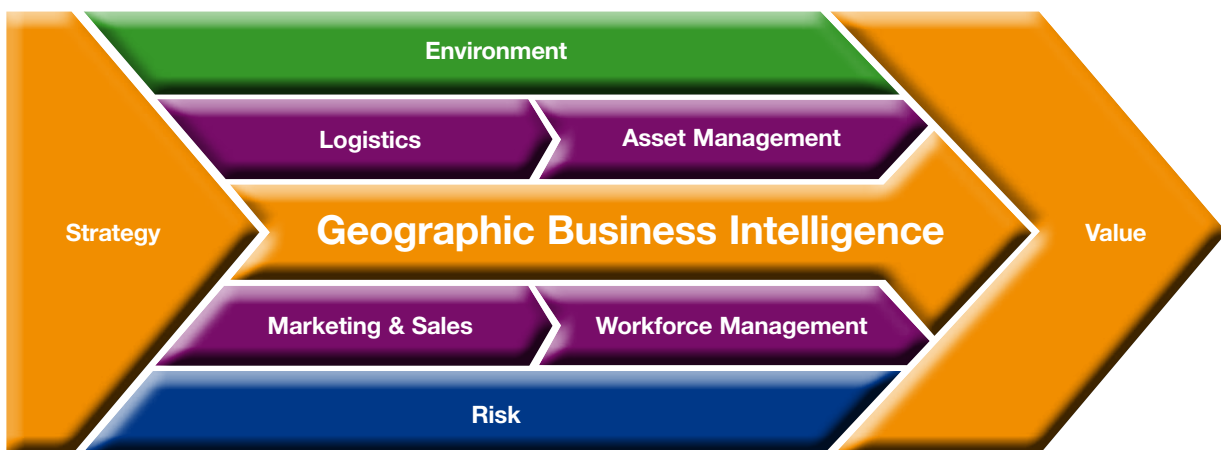


Figure 1: The Geographic Value Chain. Putting geography at the heart of the value chain adds value across the organisation and gives fresh business insight.

GBI in action

## Asset Management

**Locate your assets. Better plan their maintenance. Save costs. Manage your environmental impact.** For many organisations effective asset management impacts both business performance and cost. Every business has physical, property or network assets that must be defined in terms of their location and relationship with other assets and its business environment. Integrating GIS into traditional ERP and asset management applications can bring brand new insights and efficiencies.

When it comes to asset management, there is one group of companies that understands the advantage of using geography more than most.

Utility companies have put geography at the heart of their operations for many years. Virtually every activity of their business demands an understanding of where pipes, cables and lines are located for maintenance purposes, and how the local soil, water or air affects their day-to-day performance.

**British Waterways**, for example, has around 2,000 miles of waterway to maintain. Managing and understanding these assets is arguably its core mission, and to this end the business has been running SAP as its Enterprise Resource Planning system.

But it's also using GIS. By integrating ESRI GIS and asset management into SAP, the company has been able to adopt a 'capture once, use many' approach to data, ensuring accurate, up-to-date information is efficiently recorded from the outset and shared across the business. What's more, users can access asset information using the GIS or the SAP interface depending on their knowledge of the systems. For many people, however, a map is a more natural interface. And the GIS is integrated with the customer interface, so if a customer calls to report an incident, it is marked onto a map and a work order is automatically created.

The result? Significant time and cost savings coupled with more efficient and improved customer service.

### Beyond utilities

The asset management benefits of GIS that were pioneered by asset oriented companies are now available to organisations of all sizes. Today, many organisations are embracing the power of geography into the very heart of their projects – to quite remarkable effect.

In the Middle East, for example, the groundbreaking **Masdar City** construction is creating a brand new city from the ground up. It aims to be the world's first environmentally neutral city – and that includes the construction activities. In this project, every single asset is being built and closely monitored using ESRI GIS. Managed by international engineering and construction firm CH2MHILL, this pioneering project requires all assets to be logged, examined and modelled to a level of detail never seen before – from the construction and operation of the multi-layered transport network, right down to the energy consumption of every person in every room of every building. Once the city is completed, GIS will underpin management of all buildings, utilities, transport and beyond, making maintenance simple and rapid, to effectively prolong the life of this new landmark.

The fact is, wherever there are assets, there are overheads. To prevent excess cost, they must be managed and maintained. To manage them effectively, you must have detailed information on their location.

To get that insight, you need Geographic Business Intelligence.



*Tracking and communicating key performance indicators is an important element of the project. The Masdar GIS team built a unique, 6D GIS model – designed to depict the construction costs, carbon emissions and schedule of the planned build in 3D.*

*3D GIS is an easy way to convey complex information which everyone can digest quickly.*

GBI in action

## Marketing & Sales

**Map your customers. Understand their buying behaviour. Reach out to them more innovatively. Beat the competition.** Geography is causing a sea-change in sales and marketing operations. GBI can provide targeted insight into consumer behaviour down to the micro level, to dramatically enhance sales and marketing activity in businesses across many sectors.

Marketing funds must be used to maximum effect. Because of this, businesses must carefully target and measure their marketing activity to ensure they get real results from their limited budgets.

Location based analysis can give organisations a unique level of insight into buying behaviour on a local, national and international scale. This, in turn, enables them not only to segment geographically, but to monitor dynamics and develop more accurate targeting and propositions, as well as to review channel and location strategies.

GIS enables all of this information to be layered and visualised onto a map for a complete, end-to-end view. This helps organisations to perform in-depth analysis and make focused decisions – about what they should sell, who they should sell it to, and how it should be communicated.

### The Co-operative

With 2,200 local grocery stores throughout the UK, The Co-operative sells to a multitude of communities – often made up of just a handful of streets. Because of this, The Co-operative must understand customer buying behaviour at a micro level, to create focused, effective campaigns.

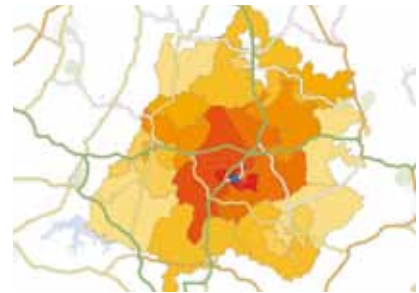
Using a marketing package from Experian called MicromarketerG3 –

featuring built-in GIS technology from ESRI (UK) – The Co-operative can split data into thematic layers, analysing more than 70 variables, from daytime population figures to household wealth. With this information, it can design tailored offers for different customer groups; it can target customers that live in ‘crossover’ patches near competitor stores; it can perform live ‘hot spot’ analysis during campaigns, before all budget has been spent; and it can accurately model sales figures for each demographic.

More than that, the Co-operative utilise GIS to maximise revenue in stores and to model store sales so that they have a high level strategic understanding of how the network could be performing.

### The Washington Times

When The Washington Times wanted to increase its circulation, staff realised they needed to learn more about readership types, their location, and the best method to reach them. Using ESRI GIS software, analysts discovered that a large segment of residents had a love of Starbucks® coffees, as well as owning their own espresso/cappuccino machines. The software enabled them to map coffee shops and coffee device repair shops, in order to place more newspaper box locations near these locations. As a result, The Washington Times significantly raised the number of copies sold.



*Analysing grocery expenditure weighted by demographics.*



*Analysing nearby points of interest to establish their relationship to demand.*

GBI in action

## Logistics & Transportation

**Plot schedules and routes. Identify inefficiencies. Improve service. Reduce carbon footprint. Optimise distribution. Achieve more with less.** Fact: by applying Geographic Business Intelligence to their transport and logistics activities, organisations can realise cost savings of up to 30%.

Putting GIS at the heart of logistics activities enables organisations to plan optimal delivery routes, save costs and improve customer service.

For example, businesses may be able to squeeze in more deliveries on the same shift. Customer services teams can give smaller, more accurate delivery windows to customers. Drivers can take shorter routes to save fuel. Work can be better balanced and smarter scheduling achieved. ArcLogistics from ESRI enables all of the above and combines this with end-to-end integration from desktop planning to the in-cab navigation system.

### Achieving more with the same – or less

**Sears** in the USA, for instance, manages one of the largest home appliance repair businesses in the world. It has recently improved productivity of engineers by more than 10 percent, using ESRI GIS software to optimise routing of engineers for all individuals.

In Sweden, **DHL** has 32 terminals spanning the country, operating over 1,500 vehicles. Standard practice was for the driver to sort parcels into the delivery order using his own knowledge of the area – yet this was highly inefficient, especially when the regular driver was not available. Using ArcGIS server, DHL created a system that geocoded addresses from bar

codes, automatically pre-sorting the delivery order into the least cost route. This system saves between 30 and 60 minutes per vehicle per day.

Meanwhile in Minneapolis, USA, **The Star Tribune** newspaper has been working to reduce costs by improving the way it plots delivery routes. Using GIS software from ESRI, the system creates fully optimised route maps including the number of trucks needed, the miles they should drive, and the time needed for delivery.

Analysis such as this can even be used to carry out 'what-if' scenarios in order to identify further options for routing efficiency. Indeed, in Minneapolis this has led directly to a reduction in the number of delivery trucks needed.

The financial consequences of GBI can be profound. At the Star Tribune, for example, the new system is projected to save the newspaper more than a half a million dollars over the next five years. And for those with shorter term financial aspirations to consider, it delivered a positive return on investment in just 2.5 months.

“Geography creates that link between the analytic and the conceptual, enabling us to make the best decisions in a very complex world.”

Stephanie Durbin-Wood, National Location Analysis Manager at The Co-operative Group

GBI in action

## Workforce Management

**Manage your employees. Allocate resources most efficiently. Optimise both routes and scheduling. Achieve (even more) with less.** They say that work is an activity, not a location. The truth is that it's both.

Today, Geographic Business Intelligence is being used to revolutionise the management of workforces in both private and public sectors. It makes it possible, for example, to strategically balance the supply of skills relative to the geographic demand for them. More tactically, GIS is used to optimise the day to day allocation of resources.

Workforce Management augments routes with schedules. The result is that every day of every week, costs are contained whilst internal and external customers are guaranteed the very highest levels of service.

During its recent business transformation programme, the UK's **Meat Hygiene Service** turned to ESRI (UK) to make its service as smart as possible. The geographic intelligence it discovered was used to help define thirty seven new business areas and allocate its mobile workforce effectively across the whole of Great Britain. This has enhanced operational effectiveness by providing uniformity of service levels across the United Kingdom.



Management boundaries can be defined logically.



The can now view the staff required to service a facility, helping the manager to plan resources.

GBI in action

## The Bigger Picture

**See the bigger picture. Lower risk. Cut costs. Drive efficiency. Boost profits. Focus marketing. Minimise environmental impact. Enhance customer service...** Geographic Business Intelligence can unlock new commercial and competitive potential in sales and marketing, asset management as well as logistics and transportation. But once a business has this insight, GBI can offer value far beyond their original expectations.

This is because some 80% of business data has a location element. Customer addresses, property assets, operational areas, delivery and access routes... all of these become more distributed the larger a business grows. Using GIS, these distributed locations become the context for organisation-wide analysis, for end-to-end efficiencies – or to help tackle the softer issues of risk management and environmental impact analysis.

### Managing end-to-end business activities

At The Co-operative, for example, geography is used to measure and understand the factors for success, the output of which is applied in the management of the business.

Geographic intelligence is used to locate, manage and promote stores in the chain. Demographics are combined with multiple data sources including loyalty cards to run the business more effectively.

The Co-operative Group has now extended its application to many other areas of the business. These include Group Marketing, Property and Estate Management and compliance activities.

Quite simply, geography provides a single framework for a diverse range of considerations. And because GBI uses sophisticated technology – in the form of Geographic Information Systems (GIS) – the Co-operative can combine and display all this analytical information in readily digestible map based charts.

### Gaining a greater understanding of risk

**RSA, formally Royal & SunAlliance**, is one of the world's largest quoted multinational groups, with over 20 million customers in more than 130 countries. In the UK, it is the largest commercial insurer with UK Property as its largest individual portfolio.

This is a reputation that is hard earned. And it does not warrant exposure to unnecessary risk.

That's why RSA has put geography at the heart of its commercial property business. Using technology from ESRI (UK), RSA has been able to dispense with traditional postcode based risk assessment, and now verifies the precise risks with pinpoint accuracy to ensure better business results. Moreover it can model the aggregate risk the business is exposed to so that it can be prudent with its decisions.

### Minimising environmental impact

To satisfy rising demand in the North of England for accessible international travel, Manchester Airport could be handling 50 million passengers a year by 2030 – nearly 30 million more than it does currently. This should bring sizeable economic investment to the local area.

However, it also brings with it some significant challenges.

Greatest of all is that the airport must achieve most of this ambitious plan within the same 625-hectare plot of land – with 350 hectares of the site set aside for environmental management and mitigation. This requires effective communication with local residents, so they are fully aware of and comfortable with development activity. And the airport must be aware of its environmental impact, to make the final building as ecologically sound as possible.

Manchester Airport has been using ESRI (UK) GIS for many years. Since the first project to monitor environmental noise back in 1996, the airport began to see value of GIS across the business, and is now using it to strategically manage the whole airport space – from safety and security, to marketing and managing customer service.

The airport is exploiting the power of business intelligence powered by geography. Putting geography at the heart of future planning enables the airport team to model the commercial, ecological and operational impact of its growth – not only within the boundaries of its site, but well into the local community.

## Conclusion

Throughout this white paper we have included examples of how GIS is helping address certain specific business challenges. But its full potential is only fully realised when geography is placed at the very heart of an organisation to create enterprise-wide geographic business intelligence.

In Masdar, for example, Geographic Business Intelligence is being used for city design, land use planning, sustainability and carbon monitoring, asset management, transportation, energy use and project management. Moreover it is using a unique 6D model to report these parameters to management.

Meanwhile at The Co-operative, GBI now powers location analysis, marketing, operations and logistics, property & estate management and business planning.

And at Manchester Airport, GBI is at the operational heart of 3 terminals, 2 runways, an integrated transport hub, the cargo handling centre, long and short stay car parks and even 6 hotels.

The point is, irrespective of the way in which GIS enters an organisation – whether it's for asset management, sales and marketing, logistics and transportation, or any other business driver – one, single system can offer value across an entire business.

Now is the time for businesses to step back and see the bigger picture. And the technology they require to do this is available today. The only thing that remains to be seen is who will seize this opportunity, and give themselves much needed advantage in an increasingly competitive climate.

## ESRI (UK): visionary thinking

ESRI (UK) can help you unlock a brand new level of intelligence from your existing business data.

Benefiting from the single, largest pool of GBI experts in the UK, ESRI (UK) is the technical authority on GIS in the British Isles. This expertise enables us to design a breadth of geographic solutions, technology and services – from off-the-shelf applications, to tailored consultancy and training services.

In the private sector, we work with market-leading companies – including Experian, APOS and IBM – to create brand new GBI-enabled systems and link together existing business data, delivering the unifying power of geography to hundreds of businesses worldwide.

Together, we can help you get a fresh perspective on your business.

### Find out more

To find out how you can tap into the hidden reservoir of intelligence within your business, contact ESRI (UK) using the details below.