

CHARTING SPATIAL BUSINESS TRANSFORMATION

An in-depth look at the business patterns of GIS and location intelligence adoption in the private sector

EXECUTIVE SUMMARY

The global use of geographic information systems (GIS) and location analytics is expected to double by 2023, becoming a \$10 billion industry. A key driver in this growth is the use of location intelligence by the private sector. With 80% of business data containing geographic information, GIS promises insights into business strategies and decisions that can enhance business success.

The purpose of this industry survey is to develop an in-depth understanding of business patterns of GIS/location analytics use. The focus of the study is on location value chain, which is the value of location intelligence across a spectrum of business functions. In a related manner, the study also analyzes the level of spatial business maturity, which is the depth of GIS enterprise integration that enables sustained business use of locational intelligence.

The survey found that business value of GIS in these companies spans across several business functions, with 86% reporting substantial use in more than one department. Further, location analytics use is poised for considerable growth in delivering business value over the next three years, with 38-51% expected high GIS use in three years for top business functions such as business research and development, sales, marketing, and operations.

The survey also found that 22% of surveyed companies have achieved a high level of spatial business maturity in using locational intelligence for competitive advantage and key to achieving this level of maturity is having high perceived value of location-based customer and business insights, a coherent GIS strategy, best-in-class technology, executive support and sponsorship, and clear articulation of the return on investment from GIS.

The study also provides insights on how companies can progress to achieve "spatial transformation," namely achieving integrated value from location intelligence for business success. Five specific actions are recommended including: pursue multi-function business growth, focus on customer and operational opportunities, develop a means to assess the value and ROI of location analytics, develop a clear and cohesive location intelligence strategy.

HIGHLIGHTS

86%
Businesses use location analytics in more than one organizational function.

59%
Businesses perceive value in location-based business and consumer insights.

22%
Businesses are currently best-in-class, spatially mature enterprises.

38-51%
Expected high GIS use in three years for top business functions.

CURRENT GIS VALUE CHAIN

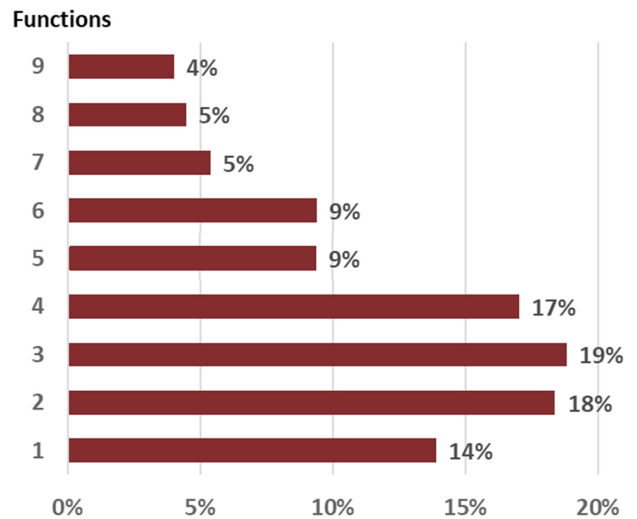
The survey found that an overwhelming majority (86%) of surveyed businesses report moderate-high use in more than one function. Overall, 51% of businesses use GIS in 1-3 functions, 35% use GIS in 4-6 functions and the remaining 14% use GIS in 7-9 functions (Figure 1). The average moderate-high use of GIS is 3.4 business functions.

The survey further reveals that among nine major business functions, GIS usage is highest for research and development (58% indicate moderate-high use of GIS), followed by operations (50%), services (48%), IT (48%), sales and business development (47%), and marketing (43%) (Figure 2).

The lagging use of GIS for C-Suite decision-making (25%), procurement (18%), and supply chain management (14%) indicates the need for additional linkages between GIS and these business functions.

MODERATE-HIGH USE OF GIS SPANNING ORGANIZATIONAL VALUE CHAIN

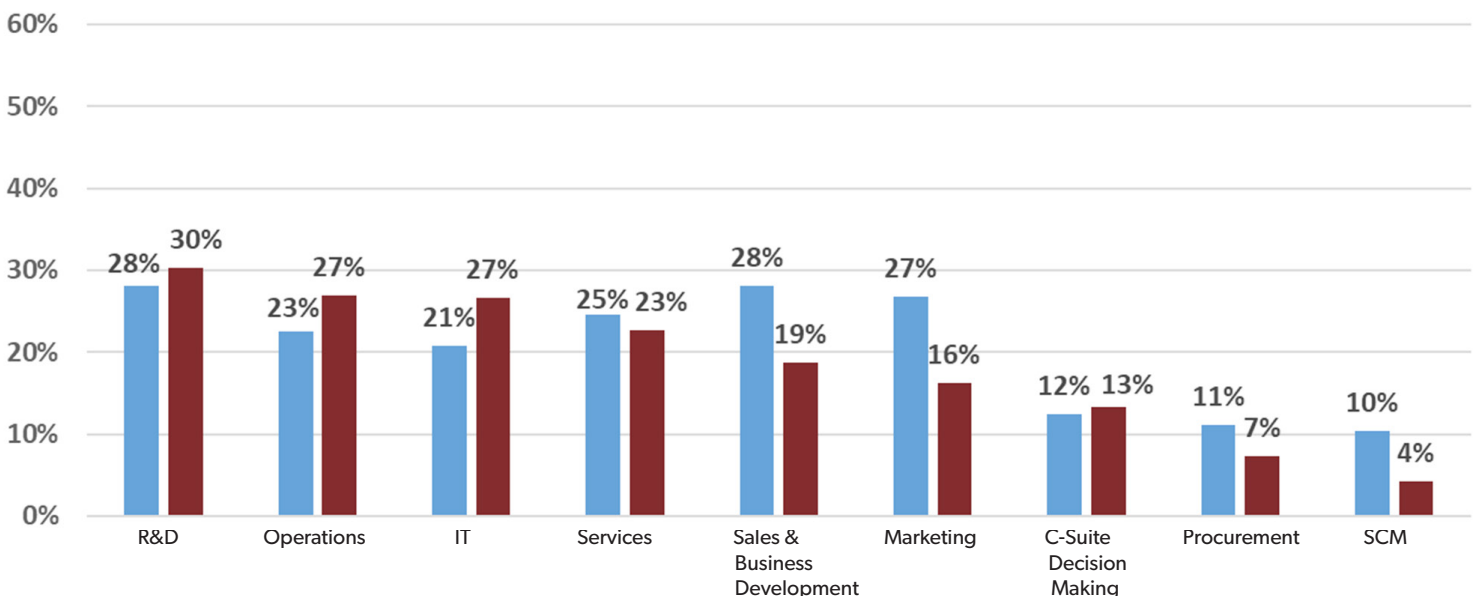
Figure 1



GIS USE ACROSS ORGANIZATIONAL VALUE CHAIN (PRESENT)

Figure 2

■ High Use ■ Mod Use



CUSTOMER CENTRIC ACTIVITIES

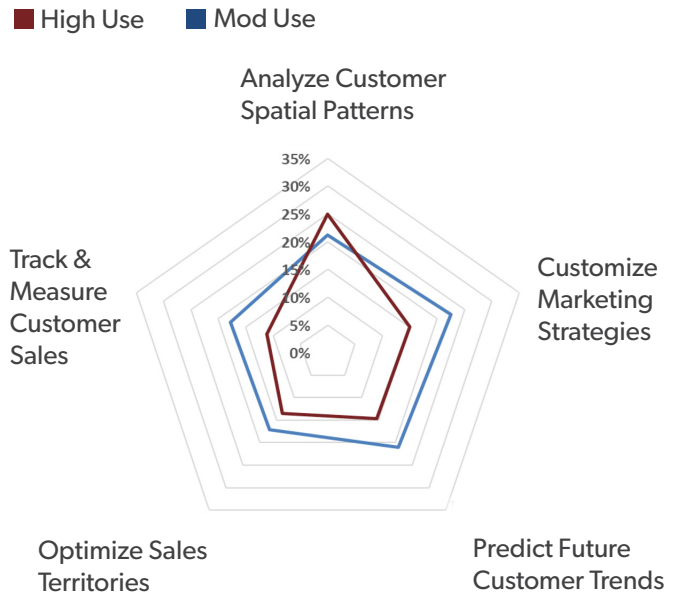
Looking more closely at customer centric activities, GIS use is highest for analysis of spatial patterns of customers (46% indicate moderate-high use), yet lowest for tracking and measuring sales activities (29%), pointing to a gap in GIS use for these latter analytics purposes. In the middle are GIS use for customizing marketing strategies (38%), predicting future customer trends (36%), and optimizing sales territories (31%). With the exception of tracking and measuring sales, GIS use for customer and sales activities seems to decline as the purpose of deriving location intelligence shifts from descriptive, to predictive, to more prescriptive in nature. Overall, the survey reveals that moderate use of GIS largely surpasses high use for analysis of customer and sales activities.

OPERATIONAL ACTIVITIES

Looking more closely at operational activities, GIS use is highest among the following activities: space and location decisions (58% indicate moderate-high use), spatial field data collection (56%), tracking and managing asset allocations (43%), predicting future operational needs (36%), and managing logistics and supply chains (20%). Similar to customer and sales activities, moderate GIS use surpasses high use for operational activities. Overall, use of GIS for operations appears currently ahead of use for consumer centric activities. Again, GIS use for predictive operational use is less than descriptive operational use.

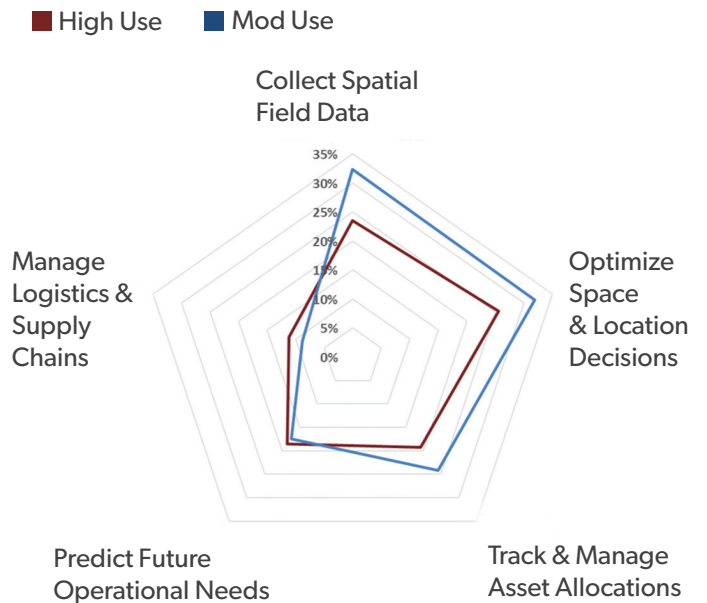
GIS USE FOR CUSTOMER / SALES ACTIVITIES

Figure 3



GIS USE FOR OPERATIONAL ACTIVITIES

Figure 4

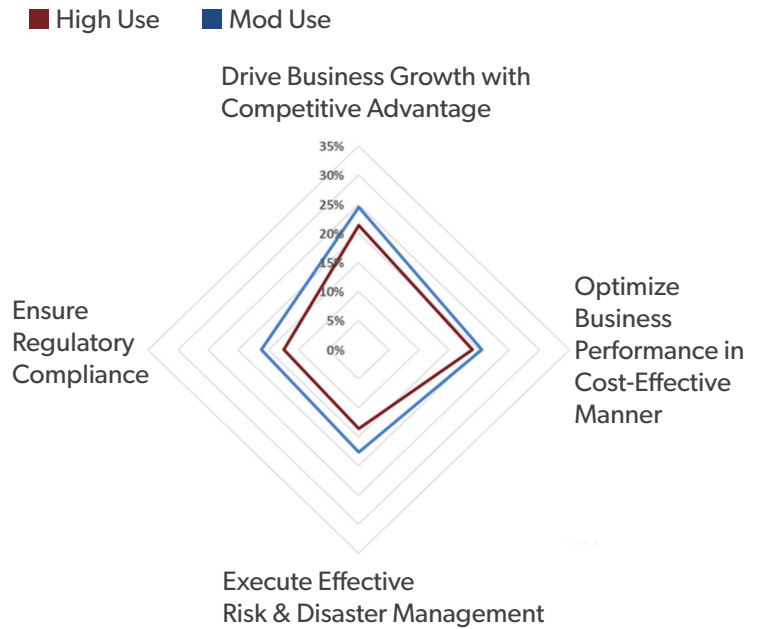


STRATEGIC OBJECTIVES

The survey found a solid focus on the strategic business objective of location intelligence. Moderate and high use of GIS to derive business growth and attain competitive advantage is highest (46%), followed by GIS use to optimize business performance (39%), for effective risk and disaster management (31%), and finally for regulatory compliance (28%). It is thus evident that business use of GIS is centered on developing strategies to ensure growth and maintaining competitive advantage. Overall, use of GIS for strategic purposes lags corresponding use for operational activities but is largely comparable with use for customer and customer centric activities.

GIS USE FOR STRATEGIC OBJECTIVES

Figure 5



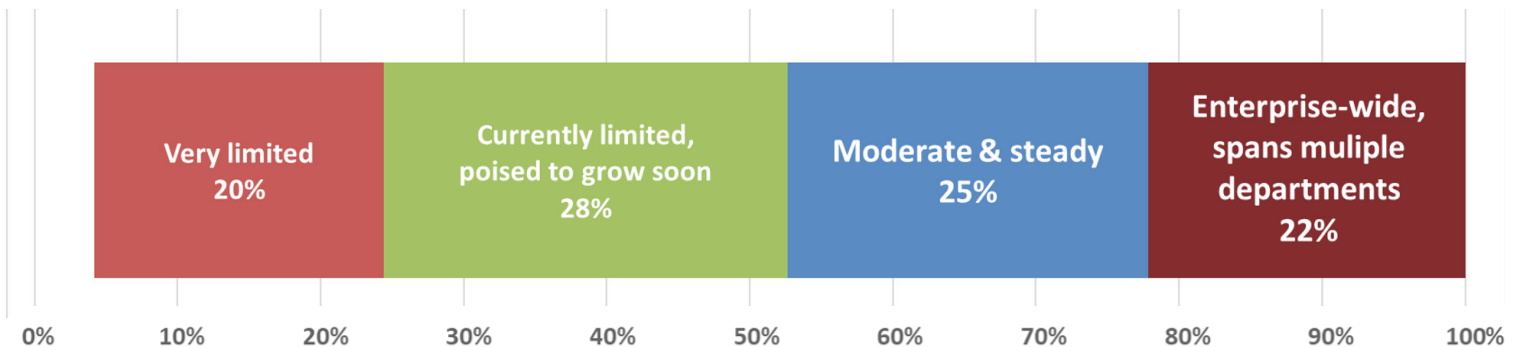
SPAN OF GIS USE

The survey reveals that roughly 1 out of 5 businesses (22%) use GIS enterprise-wide, spanning multiple departments. At the other end of the spectrum, roughly 1 out of 5 businesses (20%) report GIS usage to be very limited. In the middle, 28% of businesses report their GIS usage to be currently limited but poised to grow soon, while another 25%

indicate GIS usage to be moderate and steady. Overall, it is clear that business use of GIS has the potential to grow in the near term. However, charting a pathway for spatial business transformation is essential and that provides an impetus for analyzing dynamics of spatial maturity.

SPAN OF GIS USE IN THE ORGANIZATION

Figure 6



CURRENT SPATIAL MATURITY

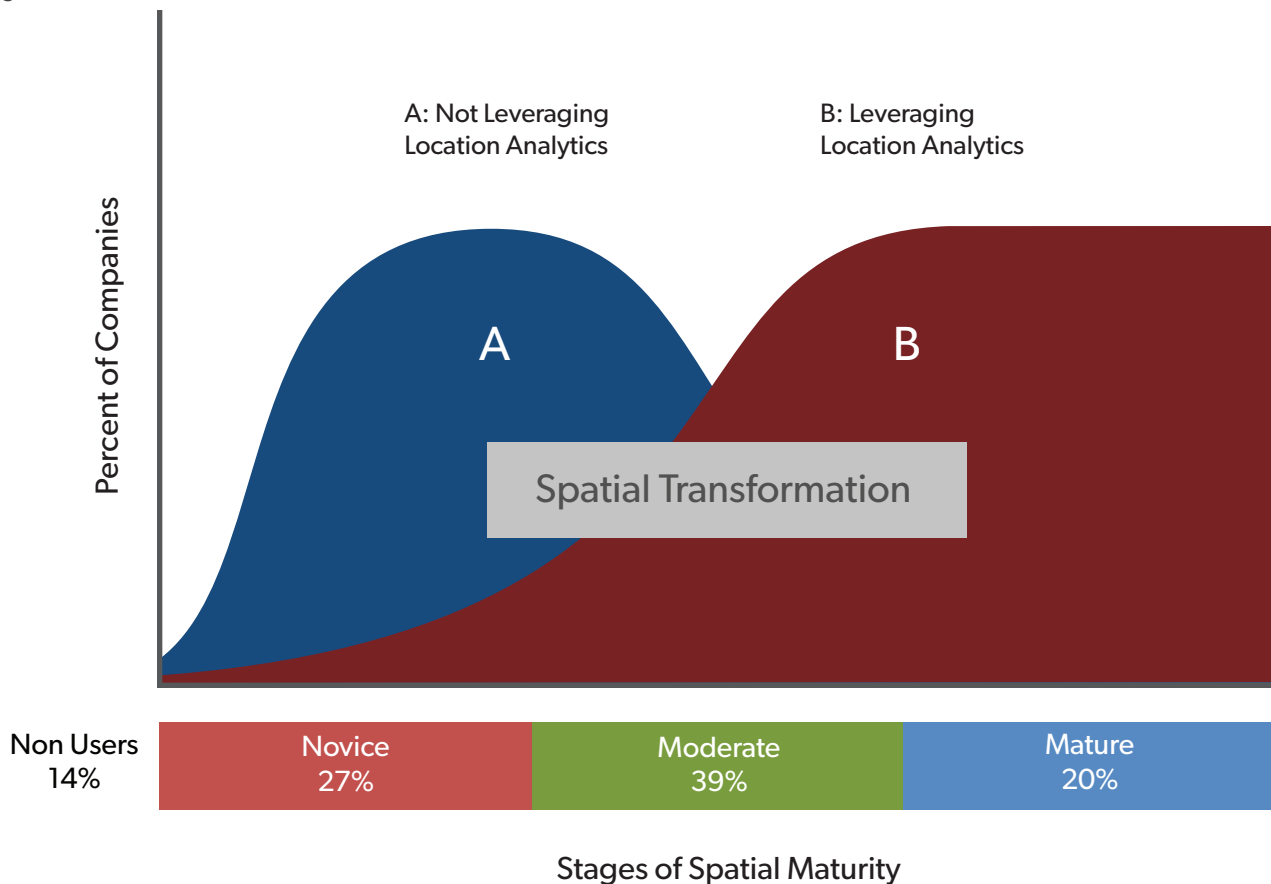
Spatial business maturity refers to the depth of GIS enterprise integration that enables sustained business use of locational intelligence. Figure 7 outlines the general level model of spatial maturity, with two distributions one present (shape A) and one future (shape B). Like other models of maturity, the idea is that overall industry use progresses from a state where most companies have modest use (and a few more extensive use) to where most companies have extensive use and fewer have modest use.

The survey reveals a wide range of spatial maturity from not using (14%), spatial novice (27%), spatial moderate (39%), to spatial mature (20%) (Figure 7).

These findings suggest that spatial transformation is underway among current GIS users, as locational analytics is becoming more deeply ingrained in the enterprise. With essentially 1 in 2 companies having moderate or greater use, and 1 in 2 companies having more limited use. This is further supported by the earlier finding that the top strategic objective for GIS use was to drive business growth through competitive advantage, followed by optimization of business performance in a cost-effective manner.

SPATIAL MATURITY MODEL

Figure 7



VALUE CHAIN IN 3 YEARS

The survey reveals that considerable growth in GIS use is expected. In three years, high use of GIS is expected to grow the most for R&D (21%), followed by sales & business development (19%), marketing (19%), services (17%), and operations (17%). Interestingly, the growth in high use of GIS in the next three years for sales & business development, marketing, and services is expected to slightly outpace similar growth in operations and IT. This points to an increasing focus on the customer centric activities such as the development of marketing promotions and strategies that increase sales.

As a result of this growth, high use of GIS is expected in the 38% to 51% range for the top five business functions (figure 8).

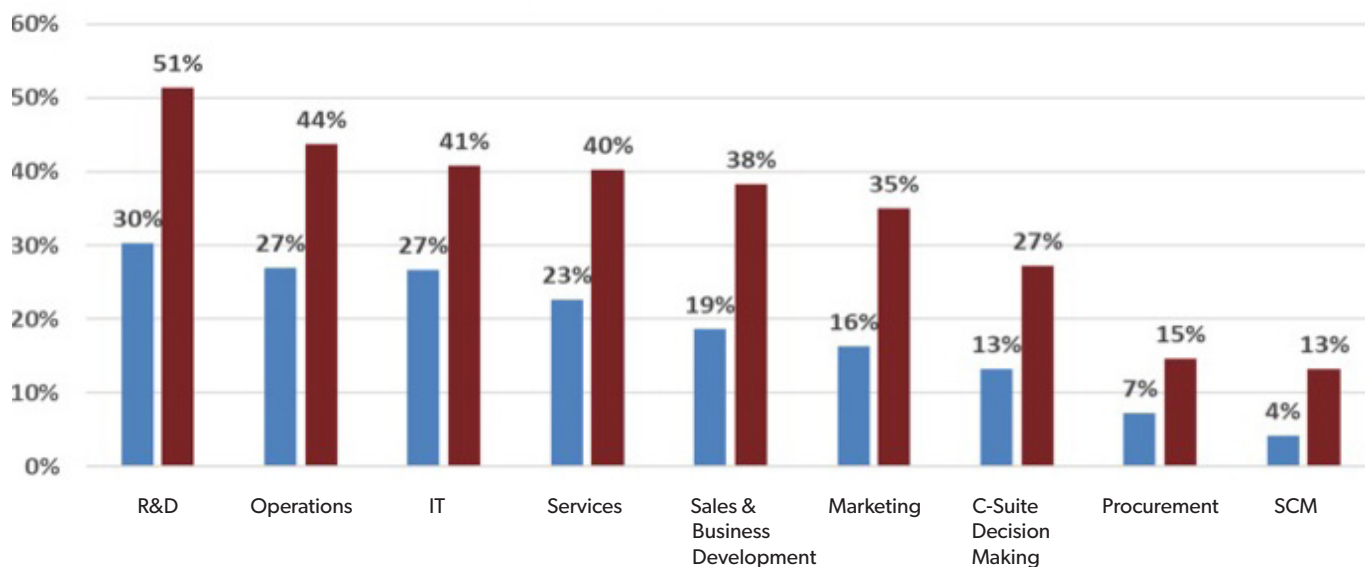
IT (14% growth in high use), C-Suite decision-making (14%), supply chain management (9%), and procurement (7%) are among the bottom four areas of growth in high use of GIS. Nonetheless, in light of the lagging use of GIS for supply chain management and procurement, this finding is very encouraging. In fact, the top three functions in which moderate use of GIS is expected to grow the most are C-Suite decision-making (8%), procurement (8%), and supply chain management (5%).

Growth in high use of GIS is expected to surpass growth in moderate use across the organizational value chain in three years. This points to an expected deepening of spatial business maturity within a relatively short time frame.

GROWTH IN GIS HIGH USE ACROSS ORGANIZATIONAL VALUE CHAIN

Figure 8

■ High Use in 3 Yrs ■ High Use Now



DRIVERS OF SPATIAL MATURITY

The survey identifies several factors that serve as facilitators and barriers to achieving greater spatial maturity. Most companies noted perceived value of location analytics (59%), availability of best-in-class technology (58%), clear and coherent business strategy (49%), C-Suite sponsorship and support (45%), and clear articulation of Return on Investment (ROI) (48%) as facilitators of spatial maturity (Figure 9).

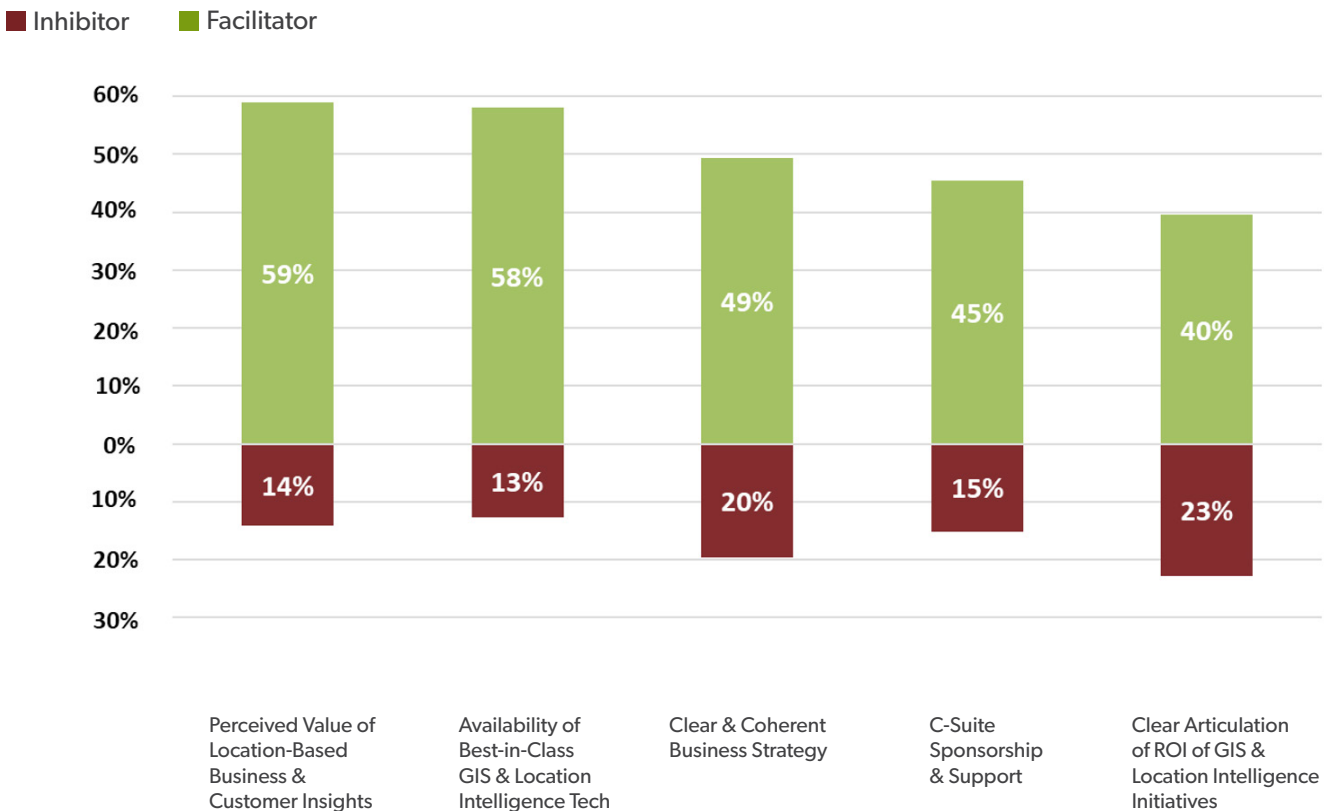
In contrast, the same factors are identified as inhibitors by a significantly smaller proportion of companies: perceived value of location analytics (14%), availability of best-in-class technology (13%), clear and coherent business strategy (20%), C-Suite sponsorship and support (15%), and clear articulation of ROI (28%).

Businesses also identifies cost (37%), budget priorities (31%), proof of value (26%), technology knowledge (24%), and resistance to change (22%) as the top five barriers of GIS adoption and use. At the other end of the spectrum, user acceptance (16%), spatial awareness (15%), lack of leadership (14%), implementation ability (13%), and lack of C-Suite support (9%) are the bottom five barriers.

Viewed in totality, cost and budget priorities along with demonstration of proof of value reaffirm the importance of determination, documentation, and articulation of ROI of spatial investments made by businesses. These findings also imply that business and management strategies and actions are critical for successful growth in spatial business maturity.

FACILITATORS AND INHIBITORS OF GIS USE

Figure 9



ATTRIBUTES OF SPATIAL MATURITY

The survey indicates the extent to which perceived value of location analytics, availability of best-in-class technology, clear and coherent business strategy, C-Suite sponsorship and support, and clear articulation of ROI are viewed as differentiators of spatial maturity. A very high proportion of spatially mature companies (over 70%) perceive these factors as facilitators, while the strength of these facilitators declines as one slides down the scale of spatial maturity with the largest reported gap between spatially mature industry leaders versus spatial novices for ROI of GIS initiatives (Figure 10).

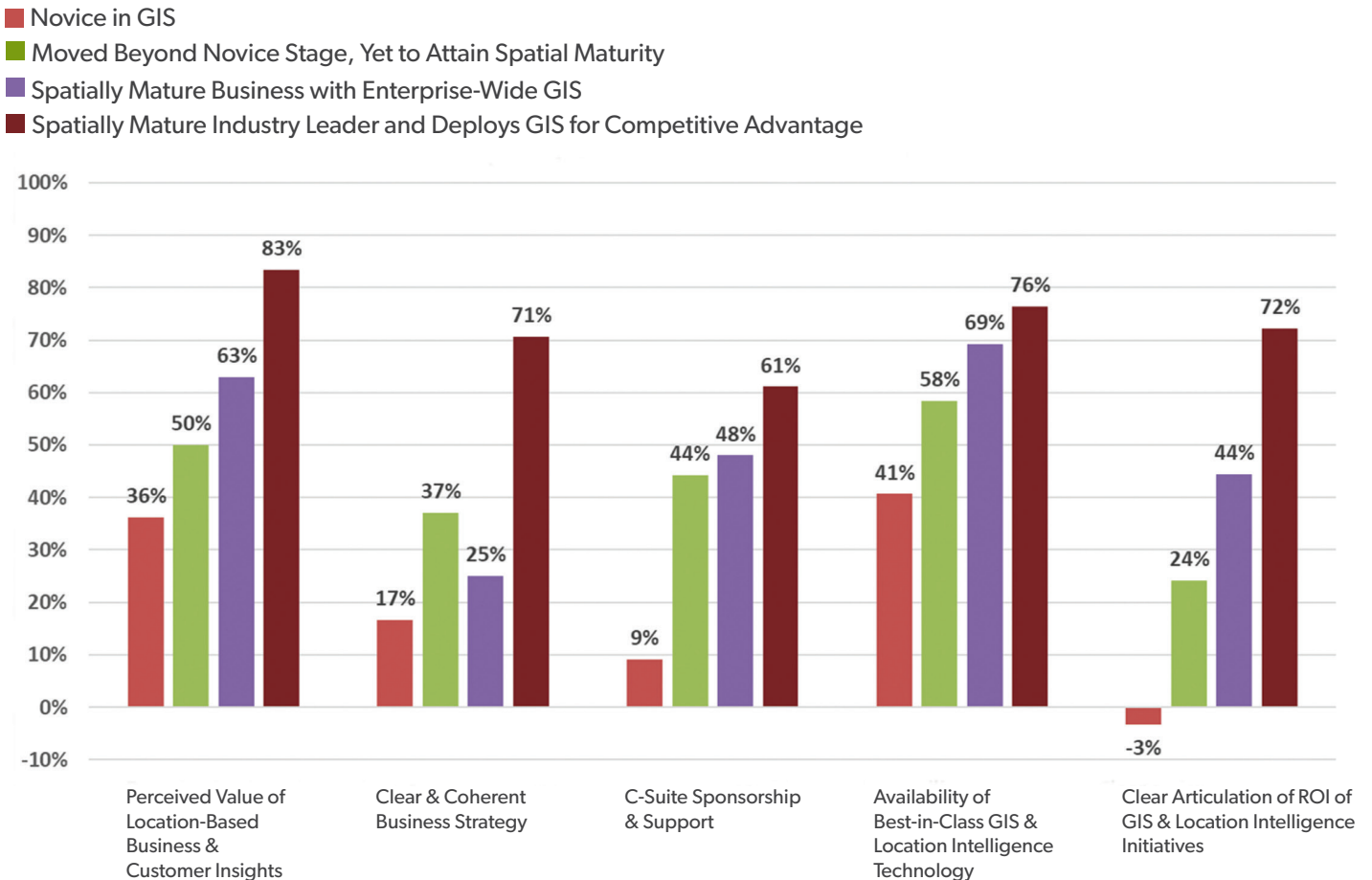
Earlier, this report provided insights into GIS use for customer and operational activities.

From this analysis, it is clear that spatially mature companies are more focused on using GIS to analyze spatial patterns of customers (67%), predict customer trends (61%), customize marketing strategies (44%), and optimize sales territories (33%). Spatially mature companies are also more focused on applying GIS across operations, including optimizing locations (68%), collecting spatial field data (58%), predicting future operational needs (37%), managing logistics and supply chains (32%), and tracking and managing assets (32%).

While spatial maturity entails finding location value across a range of business functions, customer and operational dimensions are critical for realizing locational value tied to business success.

ANATOMY OF A SPATIALLY MATURE BUSINESS

Figure 10



CHARTING TRANSFORMATION

Business use of GIS is in a dynamic period of transformation, perhaps at an inflection point for achieving business success through location intelligence. The key findings from the study as relates to location value and spatial maturity are summarized in Figure 11.

They include the following:

- * Businesses are expanding their use of GIS across a range of business functions, with an average of 3.4 business functions deepening the location value chain contribution to business success.

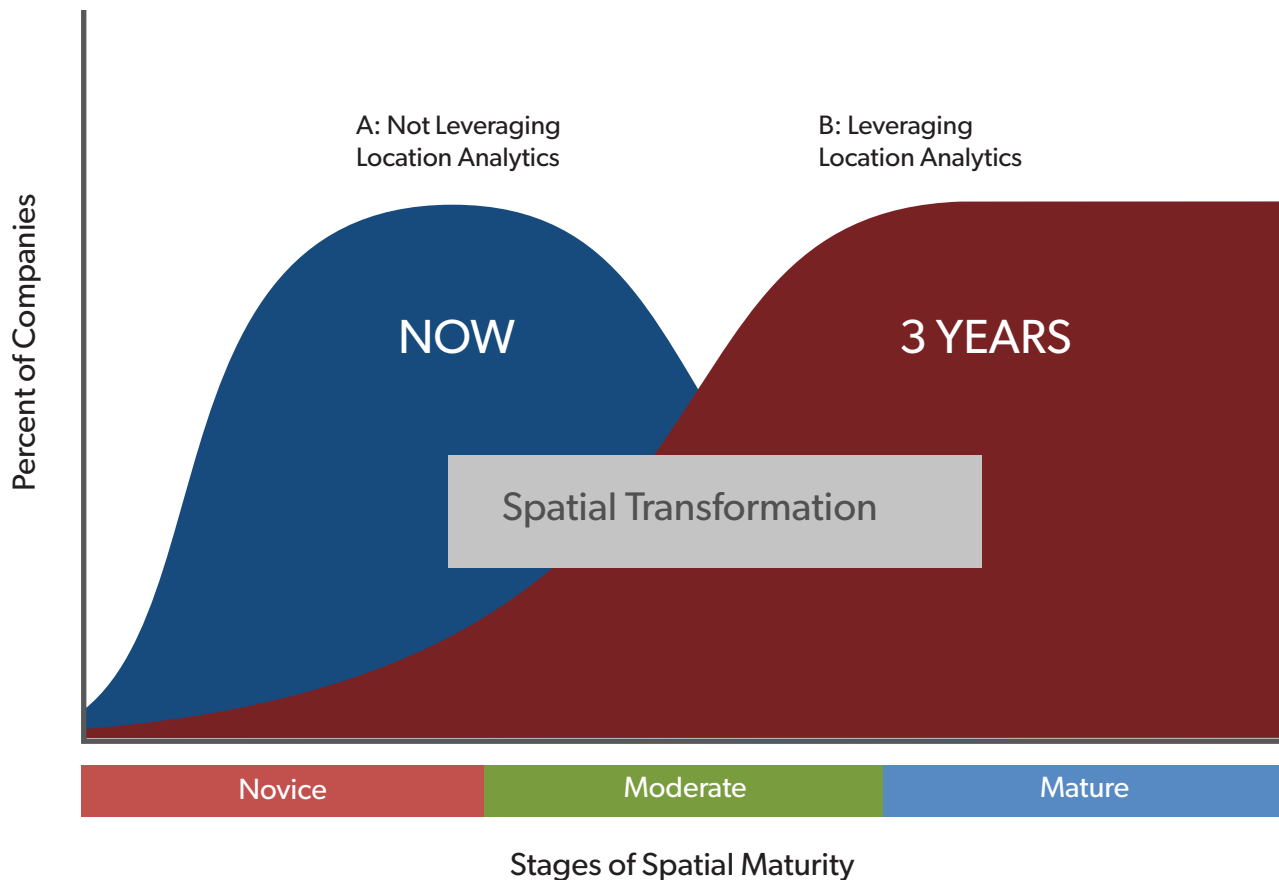
- * Business are poised by additional use of GIS to obtain locational value, as evidence by 38-51% expected high use in top business functions.

- * Barriers to continued growth in achieving location intelligence largely center around the need for developing a sound vision, expectations, and documentation of the GIS return on investment broadly construed.

- * The level of spatial maturity by business is driven by several factors including perceived value of location analytics, availability of best in class technology, clear and coherent business strategy, C-Suite sponsorship and support, and clear articulation of Return on Investment.

SPATIAL MATURITY MODEL

Figure 11



SPATIAL TRANSFORMER ACTIONS

The business growth in location intelligence use is highly dependent on actions taken within the company to advance GIS implementations in a value-added manner. The survey results support the following five actions that can be taken to enhance business success through location intelligence:

1) Multi-Function Growth: Assess opportunities to expand GIS usage across multiple business functions as relates to business needs. Consider the most natural evolution points within the business where location intelligence can make a significant contribution.

2) Customer/Operations: Customer centric and operations represent particular strong opportunities for value creation through location intelligence and should closely be considered and pursued, as appropriate to the nature of the business.

3) Value Focus: Develop a consistent means to consider and assess the value of location analytics to the business, from both qualitative and quantitative perspectives. ROI should be tracked and communicated through the management chain.

4) Business Strategy: Develop a strategic approach to GIS that links the value of location intelligence to key growth, competitiveness, cost-efficiency, and risk management goals of the business.

5) Management Support: Secure C-Suite support for location intelligence strategy by having a clear and compelling articulation of the business need and value of GIS use in the business.

SPATIAL BUSINESS INITIATIVE NEXT STEPS:

*Full report of survey findings with additional analysis.

*Follow-on research on location value and implications for realizing business gain.

*Case studies and lessons learned from best-in-class spatially mature businesses.

ABOUT THE SURVEY

The analysis and findings in this report are based on a comprehensive survey that was developed to obtain an in-depth understanding of business patterns of GIS and location intelligence use. The focus of the study is on locational value chain in businesses, and how such businesses advance in their spatial maturity in use of location intelligence.

The survey was developed by faculty researchers and graduate students at the University of Redlands School of Business and administered electronically to a large database of Esri business partners, clients, and users in June 2018. The findings in this report are based on a sample size of close to 300 responses with sample size varying for questions depending on non-response rates (2–7%). 67% of all respondents were from the United States. For 60% of respondents, GIS and location intelligence were the primary responsibility. 35% of respondents were in organizations with at least 1,000 employees, and close to 20% had an IT workforce of at least 100. Real Estate (14%), Professional, Scientific, and Technical Services (10%), IT (7%), Retail (6.25%), and Utilities (6.25%) were the five leading industry categories among respondents. Responses were aggregated, descriptive statistics were computed, and data visualizations were developed using statistical and analytical software packages.

CONTACT THE UNIVERSITY OF REDLANDS

sbi@redlands.edu
Redlands.edu/SBI



SPATIAL BUSINESS INITIATIVE

The Spatial Business Initiative is a unique partnership between the University of Redlands School of Business and Esri, the global leader in location intelligence and geospatial technologies. The Initiative aims to maximize the understanding and effectiveness of GIS in business through education, publishing, case studies documenting innovative applications of GIS in business, culminating in a Spatial Business book (published by Esri Press) aimed at professional and business school audiences.

ESRI BUSINESS SUMMIT EDITION

This report was prepared for distribution at the Esri Business Summit 2018. An extensive version of the report to be released in fall of 2018.

To cite this report, please use:

Spatial Business Initiative. (July 2018). Charting Spatial Business Transformation. University of Redlands, Redlands, CA: Author.

Research Sponsored by:



