

IBM Institute for Business Value

Improving economic competitiveness and vitality

A smarter approach to economic development



IBM Institute for Business Value

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By *Jacob Dencik*

Creating attractive and competitive business environments is key to the success of cities, regions and nations. Whether a mature or emerging economy, locations that manage to create positive business environments stand to gain tremendously from increased economic growth, job creation and prosperity. To accomplish this, governments and agencies must become agile – striking a delicate balance among business, talent and technology – to facilitate sustainable growth.

Introduction

What makes a nation, a region or a city a compelling place to live, work and do business? What makes a business want to relocate, stay, expand or grow in an area? What is the right balance of initiatives to achieve citizen satisfaction and sustained competitive advantage in the marketplace?

Given the everyday environment of change, risk assessment and rapid decision making, today's government leaders recognize these questions as familiar and challenging for good reason: our society is not getting simpler. It is getting more complex: more people, more communication, more competition.

Amid what, in recent years, has been a bleak economic landscape, there is good news: opportunities abound. Urbanization and revitalization continue at a rapid pace, transforming the way business is conducted, residents live, government administrations are run and services are delivered.

Leading cities, regions and countries around the world today are planning for comprehensive, sustainable long-term growth to build their economic competitive advantage. And they are doing so by collaborating across levels of government, convening stakeholders inside and outside of government, and working across political, social and technological divides to achieve bigger, better and more sustainable outcomes in jobs, business environments and citizen quality of life. In business, successful companies are those that can maintain long-term, sustained competitive advantage. Shouldn't communities, regions and economies be thinking the same way? Let's explore how.

Drivers of economic development

Long-term sustainable economic development is shaped by the value created by both people and businesses, leveraging technology as an accelerator for growth. It is people putting their talents to use within efficient and innovative business organizations that create value and economic growth. Nor can cities, regions or countries without the right talent successfully develop and adopt improved technologies.¹

Without the right talent, businesses can't flourish and will either decline or relocate. Talented people without businesses that invest and allow them to put their talent to use, or opportunities to make use of the most recent technologies, will seek opportunities elsewhere or see their talent erode through lack of use.

The aim of economic development is to facilitate the balanced growth of business, talent and technology that enables value creation and innovation, as illustrated in Figure 1. In achieving this growth, cities, regions and countries are also seeking to achieve positive environmental outcomes and grow in a sustainable manner that ensures the long-term well-being of citizens and organizations.

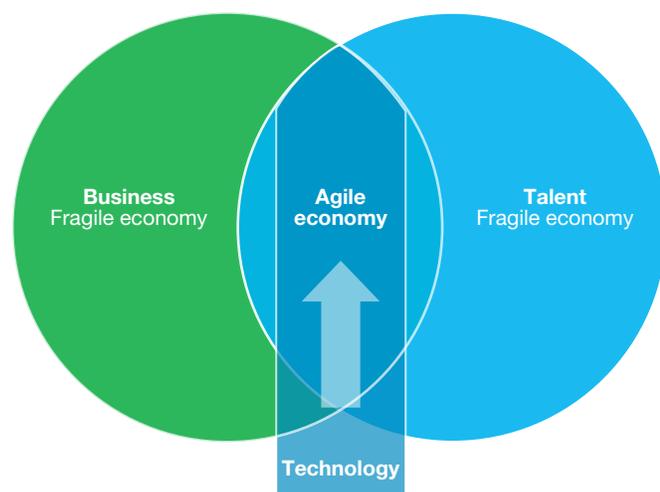


Figure 1: The three tenets of agile economies.

Figure 1 shows that cities, regions and countries with agile economies achieve a successful balance between business and talent that leverages the development and adoption of technology and innovation to achieve sustainable economic growth. They are able to attract, develop and retain indigenous talent while leveraging the potential of technology. The presence of these dynamic businesses generates job opportunities, which, in turn, attracts more talent and improves the attraction, retention and development of innovative businesses. Moreover, these locations are sufficiently agile to better respond to external threats and opportunities, be they increased global competition, disruptive technological changes or natural disasters.

Conversely, locations that lack skilled and creative workers may find themselves in a vicious cycle that discourages business creation, attraction and retention and limits the development and adoption of technology. These locations may be developing skills through education and training systems, but a lack of business activity results in sub-optimal value creation and innovation. They are facing the risk of talent relocating to pursue opportunities in other cities. This is a problem facing many university cities and towns, which see their graduates move to larger (often capital) cities because of a lack of job opportunities.

In contrast, some communities and cities are “hot-spots” for corporate investment and are highly successful in attracting companies. These locations are experiencing dynamic business activity, but have failed to develop or attract sufficient talent to meet the growing demand for skills. They are facing problems with skill gaps and over-heated labor markets. The lack of skills results in sub-optimal development and adoption of technology. Such communities and cities are at risk of losing their attractiveness as a business location, unless the talent shortage is addressed.

The primary pillars of economic development – talent and business – are developed through attraction, creation, use, growth and retention. Such efforts are accelerated by the innovation and adoption of technology.

There is thus the need to attract, create, use, grow and retain business and talent for a community or city to be successful. Technology needs to be developed through continuous innovation and adoption. The creation of environments attractive and conducive for businesses, talent and technology is critical to the economic development objectives of cities, regions and countries around the world.

Such environments are shaped by a number of factors that make up the overall business and living environment. Improving these factors has been the central task of economic development efforts to date. Areas include education, research, healthcare, physical infrastructure, digital infrastructure, energy, water, public safety, real estate and more – all factors that contribute to favorable business conditions and quality of life. Figure 3 outlines important factors for sustainable economic development.

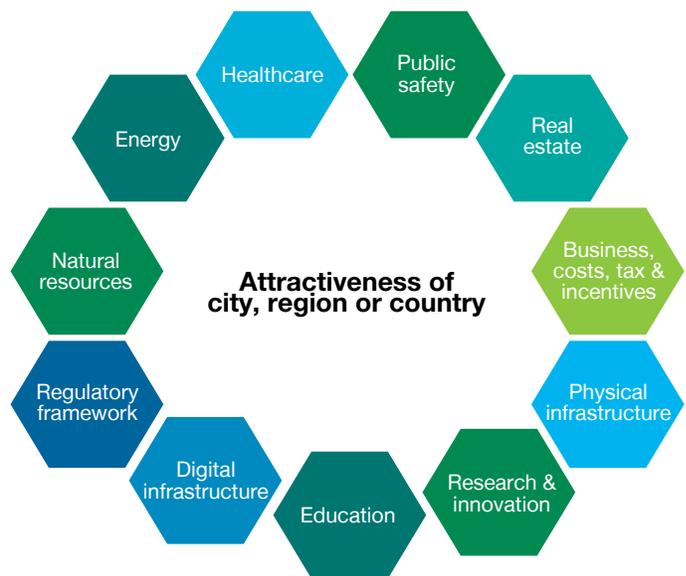
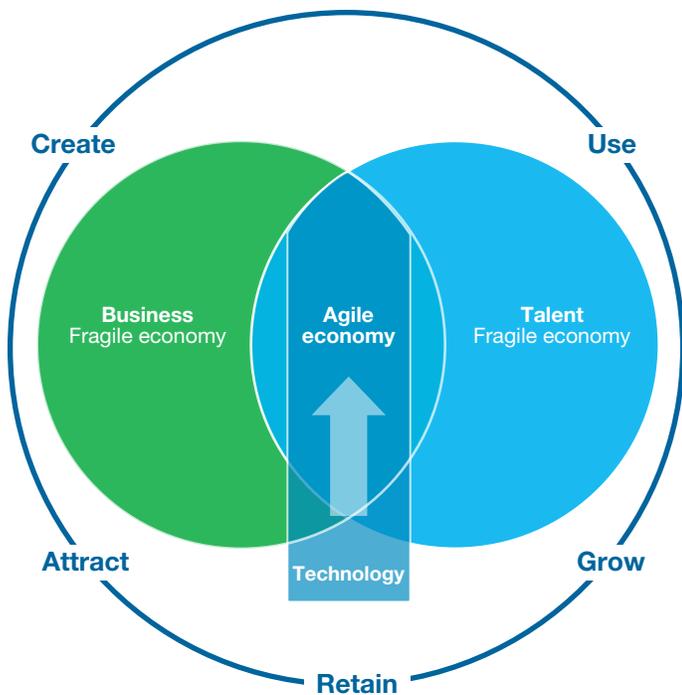


Figure 2: Economic agility supports sustainable growth.

Achieving business dynamism in a location is a combination of attracting companies, as well as the indigenous creation and growth of companies. Once there, companies also need to be given the right conditions for growth and retention. Similarly, talent can either be organically developed and grown – through education and training – or attracted from outside the location. Again, to sustain the talent base, it is important that it be put to use and retained. Both business and talent require technology to accelerate economic development through innovation.²

Figure 3: Factors influencing the attractiveness of a location.

It is important to note that the factors shown in Figure 3 and their relative importance vary by constituency, with large businesses having substantially different requirements from start-ups and small- and medium-sized enterprises. More fundamentally, the attractiveness of a location to talented people will have different determinants than that for businesses. The requirements of different talent profiles will also vary, with young enterprising people in the creative industries having different requirements than the expatriate executive of a large multinational corporation. Ensuring that a community or city is conducive to business creation, foreign investors, talented young innovative entrepreneurs, as well as expatriate executives, is a complex task that requires improvements across a number of areas and a clear focus on key priorities.

For example, a community or city cannot assume it will be competitive for everything, but must ascertain which type of business activity and talent base it is most likely to succeed in developing, attracting and retaining. This means setting priorities and thinking strategically about economic development objectives, rather than reactively trying to meet the demands of every type of business or talent group. In other words, locations – whether cities, regions or countries – need to understand their particular role in the global economy and focus on building their unique competitive strengths. This process begins by a location asking itself, “What is our ‘product’ and to whom is this product compelling?”

To further complicate matters, policy makers are now confronted with this task in an environment shaped by fiscal constraint and concerns about environmental impact. Accordingly, the difficulty of achieving sustainable growth and competitiveness, by targeted improvements to the overall attractiveness of locations, must be achieved by doing *more with less*.

The traditional approach to economic development – focused on expanding the supply of factors required by business and people (e.g., more education, more transport infrastructure, more energy, more healthcare, more emergency services) – is no longer possible. Indeed, this constant focus on more is not only financially and environmentally unsustainable, it has also, in many cases, proved counter productive. For example, simply building more transport infrastructure may merely increase transport usage and generate further pressures on the transport system. As such, there is an urgent need to adopt an approach that enhances the important economic development factors by managing them better as systems and optimizing outcomes, rather than seek their constant expansion.

New opportunities – economic development for a smarter planet

As cities, regions and countries are confronted with these significant challenges, they are also faced with new opportunities for technology-enabled improvement that constitute a paradigmatic shift in economic development. From how we manage infrastructure and utilities, to how education, health and social services are delivered to better meet the needs of citizens and business, we are witnessing a dramatic shift in how economic development can be achieved. Ushered in by a convergence of technologies that use the power of data, we are now able to improve locations in a smarter way. As noted in a recent speech by IBM Chairman and CEO, Ginni Rometty, “Data promises to be for the twenty-first century what steam power was for the eighteenth, electricity for the nineteenth and fossil fuels for twentieth – that is, the creator of enormous wealth and progress.”³

To harness the power of data for transformative economic development, it is necessary to capture data, integrate and connect it to existing and new systems, and transform it into actionable insight through analytics. In other words, data must be leveraged for *smarter action*. These developments are transforming the world, making it more instrumented, interconnected and intelligent:

- **Instrumentation** enables locations to gather more, better quality and more timely data than ever before
- **Interconnection** enables locations to link data, people and systems
- **Intelligence** enables locations to use predictive insight for informed decision making and action.

This new approach is underpinned by a growing digital infrastructure – e.g., the presence of broadband and Wi-Fi – that connects people, organizations and objects in a web of information flows that was previously impossible. The ability to capture, connect and leverage data and information through a web of people, organizations and an “Internet of Things” is ushering in completely *new business models and approaches to service delivery and government*, focused on partnerships, citizen engagement, new revenue streams and funding models.

Supported by technology that provides actors with new improved insight and analytics for effective collaboration and action, government is empowering citizens, communities and businesses to play an active role in shaping and improving service delivery – rather than treating them as passive recipients. By placing the end users (i.e., citizens, businesses and other stakeholders) at the center of how we shape our cities, regions and countries, smart solutions radically alter the ability of governments to realize their economic, social and environmental objectives.

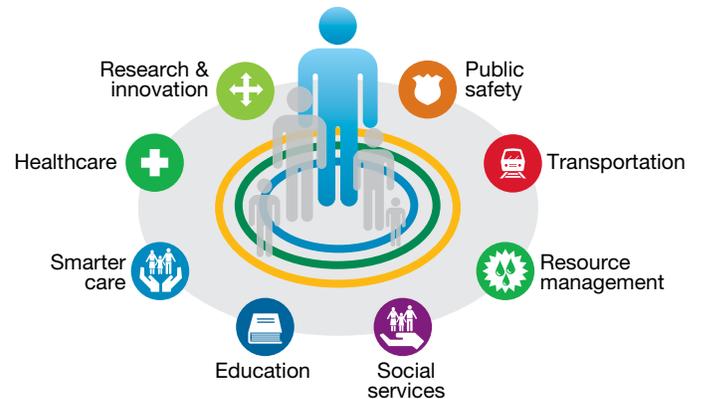


Figure 4: Citizen-defined value model.

Indeed, the transformation enabled by instrumentation, interconnection and intelligence is taking place across the different areas that have underpinned traditional business and talent development, thus holding the potential for *transforming the entire economic development framework*. Cities, regions and countries are already embracing these opportunities and improving their different systems through smart solutions.

For example, a public healthcare organization, Servicio Extremeño de Salud in Spain, has built a regionally integrated system that lets patients go to many health centers within the region, knowing a doctor there can have the patients’ complete, up-to-date records for faster and more accurate treatment.⁴

A large school district in Texas, USA, is analyzing a vast array of data from hundreds of schools to prove which programs are working, which are worth investing in tomorrow, and when to take action to help individual students, thus improving graduation rates and the talent base in the area.⁵

To encourage citizens to use multiple modes of transportation and make it easier to align the cost of transit with its impact on the environment, the Singapore Land Transport Authority implemented fare management with smart cards that can be used to pay for buses, trains, taxis, road-use charging and parking.⁶

In the Netherlands, the Dutch Ministry of Water (Rijkswaterstaat) is building a system that analyzes precipitation patterns and data from levee sensors, radar and other devices to predict flooding in low-lying areas where 70 percent of the nation's gross domestic product originates.⁷

Stockholm, Sweden, implemented an intelligent toll system in the city center, which resulted in 20 percent less traffic, 40 percent lower emissions and 40,000 additional users of the public transportation system.⁸

In Kenya, the Smart Water System project installs smart meters in hand pumps that monitor the amount of water being withdrawn and then transmits this information to the Smart Hand Pump base in Nairobi. This data is then analyzed and collated into maps that show which hand pumps are being used regularly. Lack of use indicates that the pump is out of action and engineers can be sent to fix the problem.⁹

Moreover, smarter solutions contribute to more cost efficient services, making it possible for governments to release funds for direct savings, additional investment in services or other growth opportunities.

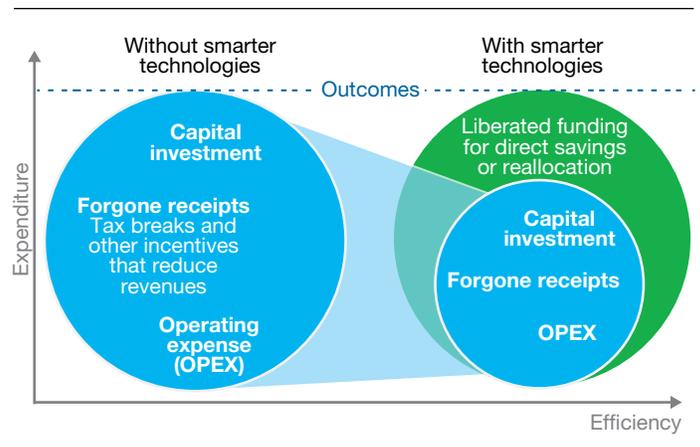


Figure 5: Efficiency gains from smarter technologies.

For example, South Bend, Indiana, USA, is using smarter water management solutions to gather and analyze sewer system data more efficiently. By doing this, the city is able to avoid additional infrastructure investment and reduce maintenance costs. The annual return on investment of the smarter solution was more than 120 percent.¹⁰

Dubuque, Iowa, USA, has used smart meters and analytics to provide citizens with the insight they need to manage and adjust their energy and water consumption, with clear results – up to 11-percent reduction in electricity usage, a 7-percent reduction in water usage and a significant increase in the rate of water leak detection. The city is also using data and analytics on real-time travel patterns to optimize transportation resources, schedules and policies, enabling better and more predictable service for citizens, more efficient use of Dubuque's municipal bus fleet and maximization of ridership. These efforts have also helped attract and retain talented people by improving the quality of life, lowering utility costs and raising the city's global profile as a smart city.¹¹

The Memphis, Tennessee, USA, police department has used predictive analytics to reduce crime by 19 percent over four years without a proportional increase in staff, while expanding coverage area.¹²

These examples show how local communities, cities, regions and countries can achieve significant improvements in discrete areas of importance for economic development by targeted actions that embrace the potential of smart solutions and technologies. Moreover, many cities, regions and countries are now also using smart approaches to *integrate* insight and efforts across systems and agencies.

In addition, public administrations are leveraging smart technology solutions to improve their approach to shaping and implementing policy and engaging with citizens and businesses. They are using data and analytics to inform discussions on policy and planning. For example, Portland, Oregon, USA has created a *system-thinking* tool to support high-level planning. Using data and analytics, the tool enables policy makers and stakeholders to learn how their city works as an interconnected system of systems as they explore interactive visual maps and simulate macro-level policy options. The tool is used in discovery, testing, communication and constituency building.¹³

It is important to stress that the ability to use smart solutions for improved service delivery and accelerated economic growth is not merely a “next” phase of economic development once traditional approaches have been exhausted. Rather, smart solutions can allow communities and cities to make leap-frog advances by embedding smart technologies and solutions as they build infrastructures, services and policies, irrespective of their current state of development.

Case study: Rio de Janeiro – Integrated knowledge for the benefit of all¹⁴

Rio de Janeiro is as a city vulnerable to heavy rain, which in the past has caused floods and landslides. In 2010, torrential rain brought the city to a standstill and killed more than 70 residents. The catastrophic event prompted the mayor to take action to prevent similar situations in the future. This led to the creation of an advanced operations center, which has access to data feeds on weather, traffic, water, energy, police and medical services. With the level of information displayed on the center’s 300 screens, the city is not only able to predict heavy rain up to 48 hours in advance, but also can tackle a whole range of potential social, economic and environmental problems before they develop.

The center is considered ground-breaking because of its ability to integrate data from more than 30 of the city’s public agencies. With the real-time data and visualizations available, the operation center is able to make accurate analyses, helping with anything from fans exiting soccer matches to traffic accidents. All this information is shared with the inhabitants of Rio through Twitter and other applications, providing them with real-time information on traffic and weather. In case of severe weather, text messages are sent to key people in the affected communities. The center will undergo further development, with more departments and information being integrated in the future. This means that the advanced operation center will eventually be able to do advanced pattern and trend analysis using computer algorithms.

For example, in Karnataka, India, the Department of Labor is using a “Spoken Web” solution with voice-based services to help millions of people – many of whom do not have access to the Web through computers and/or suffer from illiteracy – to find work. A new cloud-computing platform allows job seekers and job providers to connect, expand searches and cross reference candidates, get training and certifications, understand emerging job trends and share information all by voice, through their mobile phones and in their local languages. In addition, a mobile crowd-sourcing platform enables candidates to rank and refer jobs to one another and drive rapid dissemination of available opportunities. Unique skill-matching techniques are used to match job seekers with available jobs, while employability analytics will allow employers and the government to understand demand and supply trends. According to the Karnataka Vocational Training and Skill Development Corporation, this technology will increase the penetration of its programs and enable a vibrant employment ecosystem across the state.¹⁵

What characterizes all these examples, and is at the heart of smart approaches to economic development, is the harnessing of data and analytics to address problems preemptively rather than reactively. The capture, integration and analysis of data (in all its forms) enables us to anticipate problem areas – whether it is congestion in the traffic system, pupils at risk of dropping out of school, or water shortages occurring as a result of leaks in the water system – before such issues manifest and embed themselves in our societies. Through insight, we are able to coordinate resources and processes to respond effectively, engaging the relevant agencies and stakeholders for integrated actions that contribute to economic development by making our cities, regions and countries more attractive and conducive to business activity and talent development and use.

The move toward greater use of smarter solutions itself creates large new industries and transforms existing sectors. Spanning large complex value chains across numerous industries, “smart” technologies for improving city systems constitute a growing sector of economic activity. Cities that position themselves as pioneer locations for the development and piloting of new solutions can benefit from further investment and business activity in these new areas of growth. According to the ABI Research Institute, the market for technologies that feed into and support smarter solutions is expected to grow on a global basis from €6.4 billion in 2010 to more than €31 billion in 2016, amounting to €92 billion over the period as a whole.¹⁶ Some of the examples cited previously have generated substantial new business opportunities for both local and foreign companies in the different locations, with cities taking a problem and turning it into economic opportunity (e.g., water management in the Netherlands).

Principles for moving forward

Transforming the approach to economic prosperity is a journey that cities and regions of all sizes around the world must undertake to achieve well-being for citizens and businesses over the long term. Whether a mature or an emerging economy, it begins with understanding key drivers for success, establishing vision and objectives, rigorously managing the economic ecosystem, implementing key objectives and continually innovating and staying atop of trends. It requires excellent leadership and the existence of key enablers, such as technologies and availability of financial capital.



Figure 6: Six principles for moving forward.

While the business of comprehensive strategic planning is not a new concept, many cities, regions and countries have only recently begun to perform these wide-ranging exercises. Key elements in getting started include:

Create a unified vision – Develop and present one economic development vision and strategy within your locality, bringing together the different agencies and stakeholders to align and join up efforts. This vision and strategy need to set out the location’s ambitions and roles in the global economy, based on a realistic assessment of strengths, weaknesses and opportunities for improvement.

Co-create and partner – Successful development and implementation of smart solutions and approaches require the engagement of all relevant stakeholders, and it is often necessary to break down barriers between public and private actors to create the best outcomes. Smart economic development is achieved through a process of co-creation, leveraging the capabilities and resources of both public and private actors, as well as other community stakeholders. This sometimes leads to new business models in which co-innovation between public and private actors generates new business opportunities and revenue streams for both parties. Accordingly, while government plays a key role in facilitating the adoption of smart solutions, many actors – be they private companies, non-profit organizations, community groups or end users – are involved in the development, implementation and financing of such projects. To take full advantage of the potential of smart solutions for economic development, government must refrain from thinking of itself as the sole, or even primary, actor that can define, implement and fund initiatives. Instead, it must embrace a new role as facilitator and enabler for other actors to get involved.

Case Study: Convening to collaborate in New York¹⁷

One prodigious example of government facilitation is the agenda that the Governor of New York has set to build on the work of regional economic development councils. Activities range from technology transfer from academia, to commercialization by establishing Innovation Hot Spots, in which ten higher education/private sector high-tech incubators will be selected as “Hot Spots” through a competitive process that fosters innovation. The Innovation NY Network was established to build collaboration among academics, venture capitalists, business leaders, patent lawyers and other professionals and entrepreneurs to facilitate and grow the commercialization process.

Engage citizens, businesses and stakeholders in new ways –

Government authorities are finding new ways of engaging citizens, businesses and other stakeholders in shaping and improving their locations. As the importance of social business grows, and governments, agencies, governors and mayors are all talking on the social platform to bring out the priorities of their location, they are including citizen and businesses opinions in their decisions by understanding insights derived from the social media. The rise of social media and mobile devices is creating a shift where organizations are now moving from “liking” – simply using social technology for basic communication – to leading, where they are applying social tools and culture to fundamentally change their core business processes. This leads to positive disruption within their organizations and their industries. Today, organizations are recognizing that there are numerous opportunities for them to rethink their core operational processes through the engagement of citizens and application of social media.

Case Study: EcoCite, Montpellier, France¹⁸

Montpellier has embarked on a project in which it will collect data in real time from various sectors. The aim is to turn the metropolitan area into an urban living laboratory, enabling it to revisit and revamp all aspects of urban management through innovation. In so doing, the city authorities want to establish a new relationship with citizens by enabling them to use digital technology to create and submit near-real-time data that will help them improve urban services. The hope is not only that those services will become more efficient, but also that the city authorities will become more accountable and open to citizens. For example, a “Citizen Collaboration” app will be developed to allow citizens to send messages and images with special requests directly to the city and county governments. Local officials will process the request and send the confirmation back to the citizen. Moreover, social media analysis will be used. The solution will enable a constant and near-real-time information flow from citizens and businesses to the municipality and back.

Turn your location into a living lab for innovation and

experimentation – A unique opportunity exists for locations to turn themselves into “living labs” and test-beds for smart solutions. They can attract innovative companies and create the basis for indigenous entrepreneurs and companies. In a living lab, researchers, companies, users, public sector organizations and other stakeholders in emerging technologies collaborate on innovation processes in a real-life setting, such as a city. Living labs are unique tools in the innovation process to develop smart solutions as they are based on a user-centric approach that involves the citizens of the location. This enables user influence on the innovation process.

“But today’s competitive economy requires cities to remain vigilant and proactively manage their brand and community engagement. When corporations, entrepreneurs and startups consider where to locate, they scrutinize a city’s economic health, quality of life, workforce potential and overall reputation. Research about cities and communities frequently begins online and through social media.”¹⁹

– *Gail Roper, Chief Information and Community Relations Officer of Raleigh, North Carolina, in her blog on Citizen IBM, May 30, 2013*

Market your strengths – Marketing your location’s economic strengths is key to attracting future businesses and residents. When a location has identified its unique strengths and value proposition to business and talent, it needs to proactively promote itself. In so doing, locations now have the opportunity to adopt *smarter marketing* approaches, where data and insight can be used to segment the constituent base and utilize technology to deliver a more customized, interactive experience to key constituent segments. For example, many economic development organizations are already beginning to make more use of data and analytics to better target and prioritize their investment promotion efforts, identify appropriate target audiences and tailor their messaging. With the emergence of new sources of data and channels of communication, such as social media, these organizations are able to connect more effectively with their target constituencies and support their location’s economic development efforts.

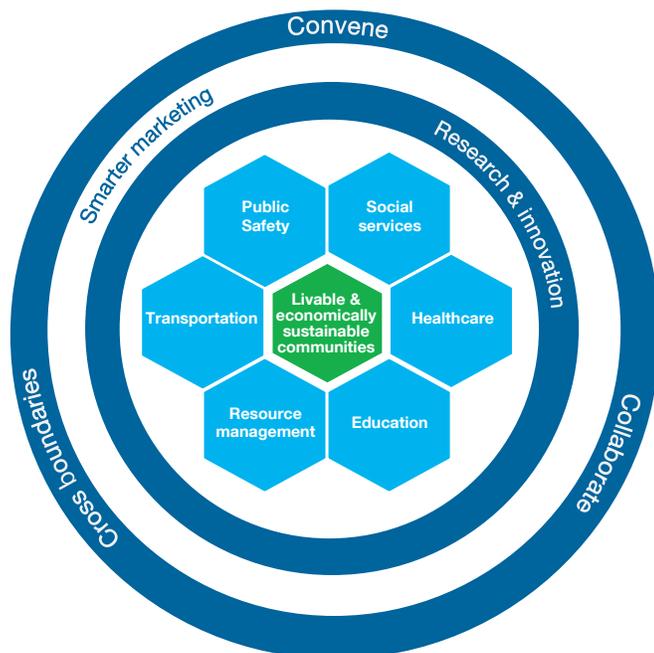


Figure 7: The leadership ecosystem supporting economic development and vitality.

Case Study: SmartSandtander, Spain²⁰

In Santander, Spain, the “SmartSandtander” project has been launched to facilitate a city-scale experimental research facility that supports and tests applications and services for smart cities. The project will stimulate the development of new applications through research into “Internet of Things” technologies in a real-life context. Using data and insight from more than 12,000 sensors that collect relevant information from all parts of the city, including traffic, the city is now able to control and test many aspects of life in the city. This makes it a living lab for innovation in a real-life setting.

Continuous improvements to competitiveness – Economic development is not a one-off initiative but requires continued improvements across the different areas of importance. Locations need to integrate development across a wide range of key stakeholders and continually innovate to bring in new ideas and sustain competitive advantage. Moreover, through improved data and analytics, it is now possible to better monitor and ascertain new trends and emerging improvement needs affecting citizens and businesses, as well as use insight to continually engage stakeholders in shaping improved conditions. For example, some cities, regions and countries are now developing and publishing regular dashboards – sometimes with real-time data – on the economic, social and environmental health of their location, using this to inform policy makers, citizens, businesses and other stakeholders. This improved and open data and analytics not only provide better means for monitoring, but also support discussion and the ability to leverage the “collective intelligence” of the community to identify problems and shape appropriate solutions and actions.

It is evident from Figure 7 that public sector leaders are under intense pressure to do more with less in their efforts to meet the needs of citizens, businesses and other stakeholders. As a result, leaders are looking to innovate across organizational, process and technology boundaries to realize their economic, social and environmental objectives. This calls for new leadership behaviors by government, as well as private-sector actors and other stakeholders, emphasizing the ability to convene multiple actors, enable collaboration and the crossing of boundaries.

Whether a mature or emerging economy, locations that manage to create attractive and competitive business environments stand to gain tremendously from increased economic growth, job creation and prosperity. However, the price to pay for failing to address weaknesses has also increased. The future global economy will therefore have a clearer demarcation between winners and losers, and the time to decide which category your city, region or country belongs in is now.

About the author

Jacob Dencik is a Senior Managing Consultant with IBM-Plant Location International, with extensive experience advising companies around the world on their global operations and location strategies. He has worked on a number of regional, national and international projects for government clients as an expert and economist on competitiveness, foreign direct investment, sector/cluster analysis and innovation. Jacob is a co-author and contributing author of two recent books about innovation. He can be reached at jacob.dencik@be.ibm.com

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IBM Global Business Services, through the IBM Institute for Business Value, develops fact-based strategic insights for senior executives around critical public and private sector issues. This executive report is based on an in-depth study by the Institute's research team. It is part of an ongoing commitment by IBM Global Business Services to provide analysis and viewpoints that help companies realize business value. You may contact the authors or send an e-mail to iibv@us.ibm.com for more information. Additional studies from the IBM Institute for Business Value can be found at ibm.com/iibv

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October 2013
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