



**strategic**  
**networks group**  
the broadband economists

***Broadband Illinois  
eStrategy Report***

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## Summary and Recommendations

Many communities and regions across Illinois are dealing with economic dislocation and an aging population. Most rural areas face the additional challenge of the steady shift of population from rural to urban areas<sup>1</sup>. In the face of these challenges, how can communities and businesses maximize their competitiveness, while improving their quality of life?

One area with significant potential is broadband (see Section 1.2 for a definition), which can be leveraged into tangible benefits for communities, businesses, and households. This report and its companion document, *Illinois eSolutions Benchmarking*<sup>2</sup>, demonstrate that businesses can become more productive, competitive, and reach into new markets. Households can access services more easily and often more cheaply. Governments can delivery services more cost effectively.

The first step in benefiting from broadband is acquiring connectivity or access to the Internet. Once access is acquired, the second step is adoption, whereby households, businesses, and other organizations begin to use their high-speed Internet access on a regular basis.

The third stage in broadband development is utilization of the Internet in increasingly productive ways that bring concrete benefits, such as jobs, new savings and revenues, and improved quality of life. This report focuses on utilization as the third stage of broadband development.

The benchmarking of Internet utilization in Illinois is based on data collected in 2012. This report represents an analysis of this data from a regional perspective and is intended to support regional broadband planning.

### Utilizing Broadband

This report shows that the ability to utilize or leverage broadband varies significantly across businesses, organizations, and households. Not all businesses or households have been able to turn the potential of broadband into measurable success in terms of jobs, company attraction and retention, increased tax base and revenues, and more efficient and effective citizen services. Turning potential into reality requires skills, training, and both formal and informal support.

In those industry sectors and communities that already have a large, diverse, and modern economy and work force, building broadband infrastructure may be sufficient to realize the potential of broadband. However, many industry sectors, communities, businesses, and households have limited Internet related

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<sup>1</sup> See various publications of David McGranahan from the USDA: <http://www.ers.usda.gov/ers-staff-directory/david-mcgranahan.aspx>.

<sup>2</sup> A summary of the findings from the 2012 benchmarking effort can be found in the *Broadband Illinois eSolutions Benchmarking Technical Report (December 2012)* which is largely descriptive and does not include the analysis or recommendations in this report.

skills and capacity. Benchmarking data shows that for these groups, leveraging broadband often lags, even with state-of-the-art connectivity<sup>3</sup>. The consequence is that these communities (and households and businesses) lose out on many of the benefits of broadband. More importantly, over time, these communities are at risk of becoming economically uncompetitive and generally less attractive to households and businesses.

This report examines how organizations and households in Illinois differ in their utilization of broadband and where they can look to make improvements. The report shows in detail how different industry sectors and household types compare to each other, especially between and within regions. The report provides insights and hard evidence that allow regions, businesses, and households to assess where they stand and to identify what kinds of actions will improve their performance and benefits.

The report includes recommendations for how the State of Illinois and its regions can improve utilization of broadband by its businesses and households, thereby improving their economies and quality of life. Recommendations are broken down into three areas:

- gaps and opportunities where regions are lagging in their use of the Internet and broadband;
- key barriers to improving the use and benefits of the Internet and broadband;
- the best ways to build skills and abilities.

Analysis and recommendations are identified for both organizations (commercial and non-commercial) and households. For the purposes of this report, regional analysis has been organized into ten distinct regions of Illinois, as shown on the map provided at the end of this section.

*This report uses data collected in 2012 from regions across Illinois. A total of 7,253 organizations and 2,129 households contributed to the broadband benchmarking effort. The organizations consisted of 4,620 commercial businesses, 1,497 government entities and 1,136 non-for profits.\**

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<sup>3</sup> This statement is supported by data from eSolutions Benchmarking efforts undertaken by Strategic Networks Groups (SNG) in non-metropolitan communities that have had broadband for an extended period of time. The statement is also supported by comments made by Internet Service Providers during rural broadband planning workshops facilitated by SNG.

## Recommendations

To help stakeholders and communities better understand and use this report, the recommendations of the report have been structured around fundamental questions that leaders and decision-makers face in terms of leveraging broadband for the socio-economic benefit of their communities and constituents.

### ***1. How important is high-speed Internet access to Illinois, its communities, and its residents?***

In the twenty-first century, broadband access has become an essential part of a region's infrastructure, a business's internal and external operations, and a household's participation in their community life. Availability and meaningful use of high-speed Internet access are directly tied to a community's viability, competitiveness, and quality of life. However, each region and community has its own unique characteristics, assets, and challenges. Current Internet usage and opportunities for development vary widely and are explored in detail in the various sections of this report. Each region requires strategies and initiatives that address its unique situation.

**Recommendation #1:** *Each region or groups of communities must develop its own strategy and initiatives based on its own characteristics, values, and priorities.*

*Over 18% of households would "definitely" relocate to another community for broadband service if it was not available to them in their current location. Another 20% would consider relocation "very likely". Broadband was also considered "essential" for selecting location by 34% of businesses and other organizations, as well as "essential" for remaining in location by 55% of organizations. Benchmarking Data for Illinois, December 2012.*

### ***2. Where are the major gaps or weaknesses in utilization of the Internet?***

Key gaps in Internet utilization are related to household income, age, and skill level, degree of "rurality", and organizational size and industry sector. Prioritizing industry sectors and other economic groups must be done within a regional context. Factors such as the composition of the regional economy (in terms of size of businesses and dominant industry sectors) are considered in this report in Section 2. Regional planning will need to consider additional factors and considerations, such as industry sectors in decline or regional strategies for developing specific sectors. In general, focus should be on industry sectors that make the largest contribution to the economy and that have the greatest growth potential.

**Recommendation #2:** *Focus on high opportunity industry sectors within each region rather than undertaking broad but untargeted initiatives.*

### **3. Are community anchor institutions keeping up-to-date in their use of the Internet?**

Community anchor institutions (CAIs – libraries, local governments, schools, etc.) are a key sector that utilizes the Internet to improve the well-being of communities and their residents. In addition, many community anchor institutions play a critical role in the adoption and utilization of the Internet by local businesses and residents. Section 2.2 provides evidence of unequal utilization of the Internet by different CAI sub-sectors. Local government entities and public safety organizations report relatively low utilization. In addition, the average non-metropolitan CAI has notably lower utilization than their urban peers, especially in certain sub-sectors such as libraries and economic development agencies.

*Recommendation #3: Community Anchor Institutions in non-metropolitan areas should be a priority. Particular attention should be given to local government and public safety entities, as well as libraries and economic development agencies.*

### **4. How do we use the potential of the Internet to maximize job creation?**

Small to medium sized organizations with 1 to 49 employees should be a focus for all regions. This segment, considered in Section 2.3, is important for the following reasons:

- Includes 94.6% of all establishments in Illinois.
- Has the weakest utilization levels compared to organizations with larger numbers of employees.
- Is a dynamic engine for employment growth, especially through use of the Internet.
- Has the least internal capacity and expertise to adopt more sophisticated and productive Internet applications.

*Recommendation #4: Focus on the small-medium enterprise segment, especially those with 1-49 employees, to increase Internet utilization, thereby driving competitiveness, revenues, and job creation.*

### **5. In what areas do small to medium sized businesses need help?**

The Illinois eSolutions Benchmarking (eSB) process identifies which types of Internet enabled applications and processes are easiest or hardest to adopt, as evidenced in the tables in the latter part of Section 2. By using data on barriers to adoption, action plans can be defined at the regional level to address target groups.

*eSolutions is the term used in this report to refer to the integration of Internet technologies with the internal computer-based systems and applications within or among organizations for a variety of operational processes. eSolutions encompass not only product delivery and payment transactions (e-commerce) but also all processes that may be facilitated by computer-mediated communications over the Internet.*

**Recommendation #5:** *Initiatives aimed at increasing utilization among the small to medium enterprise segment should focus on the following 9 utilization categories:*

1. *Delivery of services and content*
2. *Rich media or service creation*
3. *Teleworking*
4. *Selling goods or services*
5. *Advertising and promotion*
6. *Staff training and skills development*
7. *Social networking*
8. *Accessing collaborative tools*
9. *Customer service and support*

### **6. How can we reach households that use the Internet only minimally?**

Many households that use the Internet still do not use the Internet very productively. Low utilization households are very similar to non-adopting households. They are disproportionately older and lower income. Households with low Internet adoption represent an important group due to the social and economic benefits that can be accessed through the Internet. As governments and businesses move their services to the Internet to achieve better reach and cost efficiencies, it is increasingly important that citizens have the ability to access and benefit from these online services. However, a large portion of lower income and older households have difficulty adopting and using the Internet, as described in Section 3. Given that low adoption and utilization are strongly tied to age and income, programming should be targeted at people over 64 and households with lower incomes.

*The poorer one is and the older one is, the less likely one uses the Internet and the less productively one uses it.*

**Recommendation #6:** *Develop training programs and resources that target households over the age of 64 or have below average incomes.*

### **7. Is it true that households in rural areas have a particularly hard time in adopting and using the Internet?**

Yes! While both urban and rural households may struggle to use and benefit from the Internet, information in Section 3 reveals that rural households are relatively disadvantaged, with households being generally older and having lower average incomes. Table 20 shows that non-metropolitan areas have significantly lower utilization levels compared to metropolitan areas. Consequently, non-metropolitan households tend to have greater difficulty in accessing educational, health and government services, all of which are increasingly available online. Table 7 shows that businesses in non-metropolitan areas also have lower levels of Internet utilization when compared to metropolitan areas.

**Recommendation #7:** *Non-metropolitan areas are a priority for Internet training initiatives.*

## 8. How can we help citizens of Illinois make better use of the Internet?

Rather than trying to entice target populations into traditional training programs, such as classroom courses, eSolution adoption initiatives should reflect the preference for both self-directed online resources, as well as existing informal networks that already have participation by these target groups. These can include seniors' centers, libraries, churches and community centers.

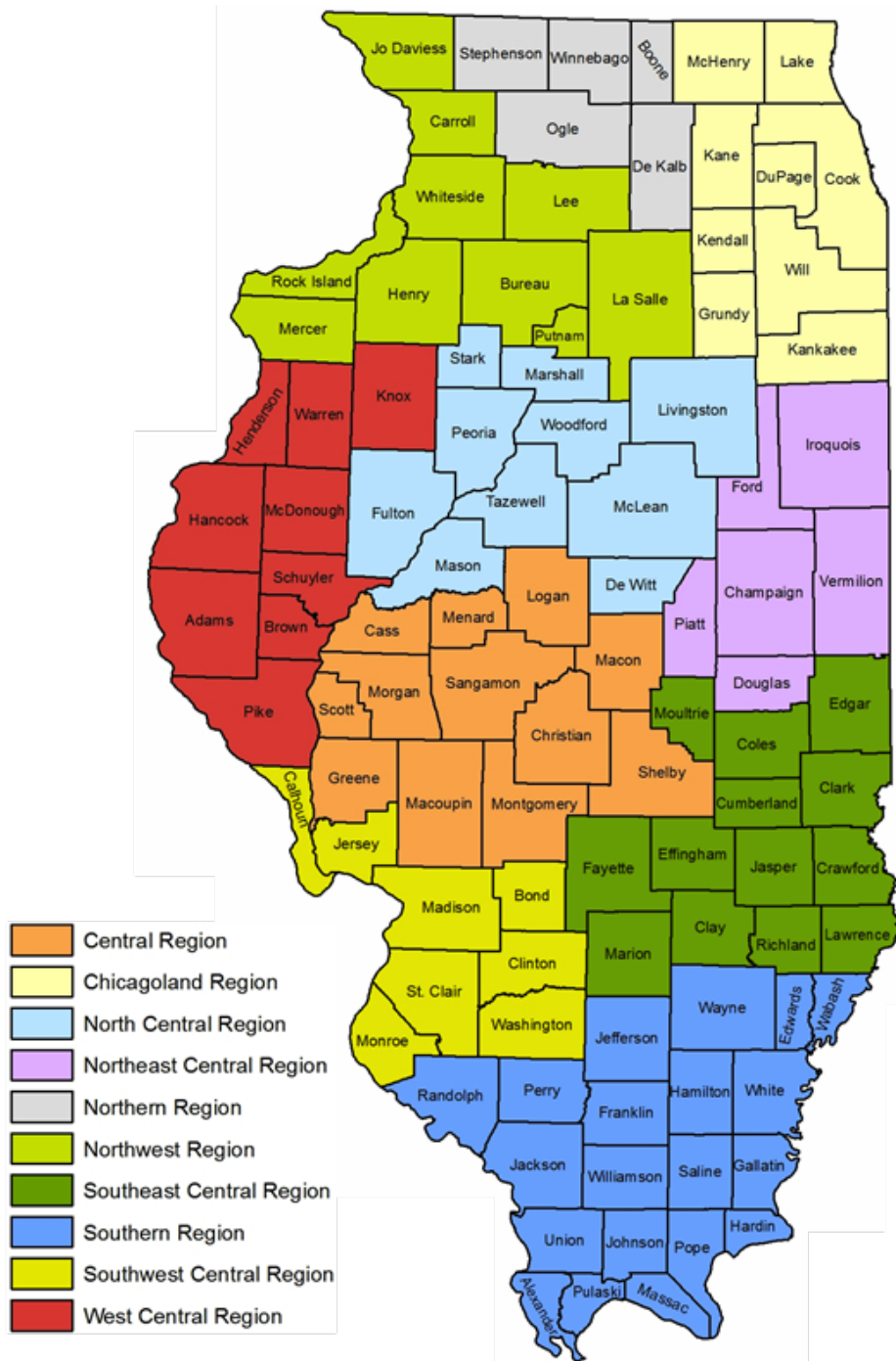
**Recommendation #8:** In designing initiatives to increase and improve Internet utilization by households and organizations, considerable weight should be given to those learning methods that are preferred by the target populations.

*The preferred learning methods of those over 64 in Illinois are "talking to others" (56%) and "online information" (49%). The least preferred learning method was "classrooms courses" (preferred by 21%).*

*See Table 18*



Map of the Ten Regions in Illinois



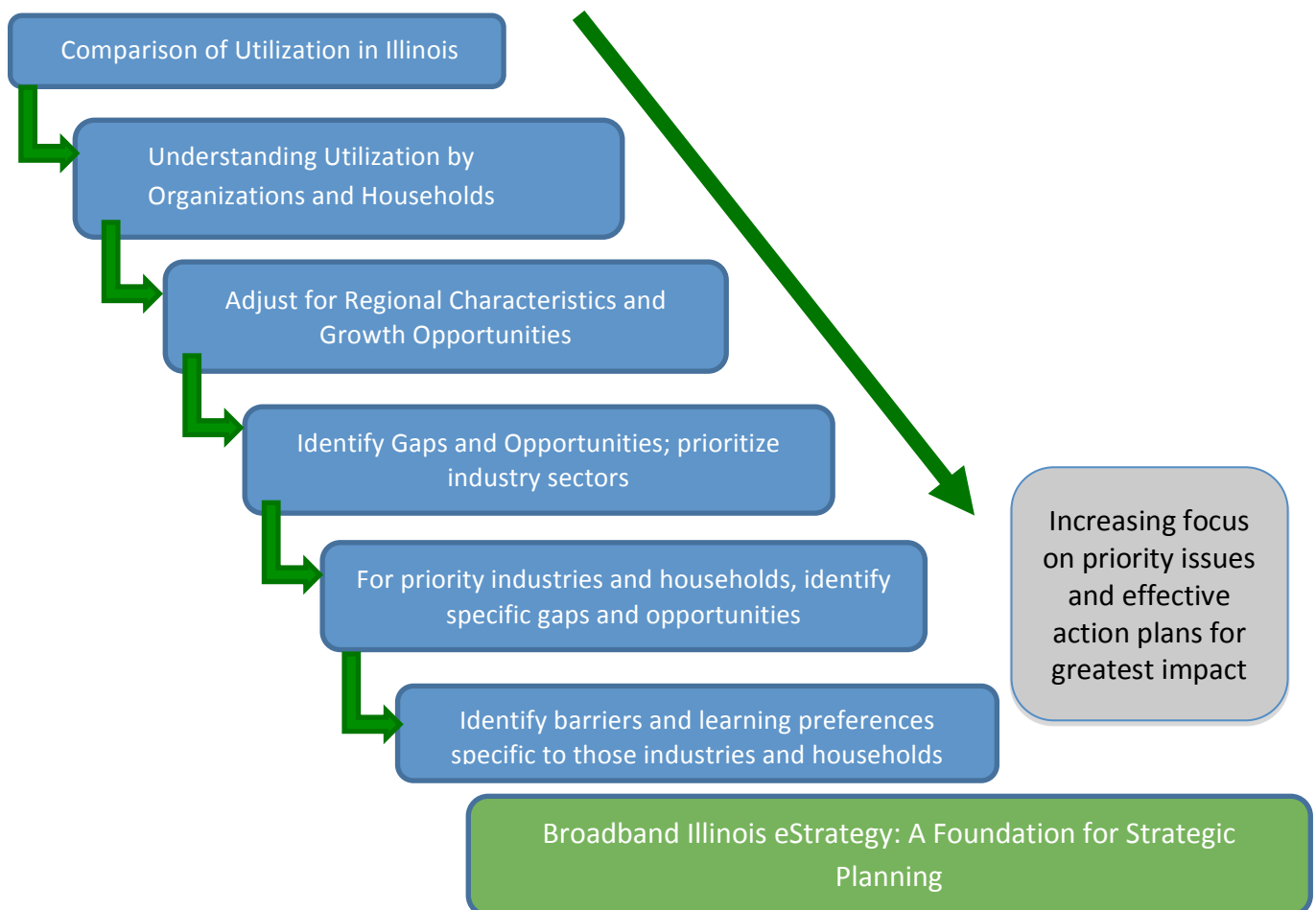
# 1. Starting Points

## 1.1 Organization and Objectives of the Report

This report is designed to be a catalyst for leveraging broadband through actionable intelligence. The chart below outlines the steps used in this report to move from descriptive data to detailed information on targets, priorities, and strategies. The goal of the regional analysis of broadband in Illinois is to:

1. Identify which segments of the regional economy utilize the Internet to a greater or lesser degree.
2. Prioritize the segments that show utilization gaps based on importance to the regional economy and opportunity to address the gaps.
3. Identify specific uses of the Internet that should be addressed to close the gaps, resulting in effective actions that are targeted where they will have the most impact.
4. Identify the barriers to improved Internet utilization, as well as the best means to overcome them.

### Leveraging Broadband for Economic and Social Development



## 1.2 What is Broadband?

The following definition of "broadband" comes from the National Broadband Map National Telecommunication and Information Administration web site. "Broadband refers to a high-speed, always-on connection to the Internet. The primary factors that people consider when deciding what type of broadband Internet service to subscribe to include service availability, connection speed, technology, and price. Organizations define broadband in different ways. For information to be included on the National Broadband Map, the technology must provide a two-way data transmission (to and from the Internet) with advertised speeds of at least 768 kilobits per second (Kbps) downstream and at least 200 Kbps upstream to end users." **More recently, the FCC has set a goal of affordable broadband with a minimum download speed of 4 megabits per second** (<http://www.broadband.gov/plan/>). For the sake of consistent use of terminology, the FCC has defined the following "Internet speed tiers".

FCC Speed Tier Download Speeds Broadband		
	From	To
1st Generation	200 Kbps	768 Kbps
Tier 1 Broadband	768 Kbps	1.5 Mbps
Tier 2 Broadband	1.5 Mbps	3 Mbps
Tier 3 Broadband	3 Mbps	6 Mbps
Tier 4 Broadband	6 Mbps	10 Mbps
Tier 5 Broadband	10 Mbps	25 Mbps
Tier 6 Broadband	25 Mbps	100 Mbps
Tier 7 Broadband	Greater than 100 Mbps	

FCC Activity Minimum Recommended Download Speeds(Mbps)	
Activity	Minimum Speed Recommended (megabits per second)
Email	0.5
Web browsing	0.5
Job searching, navigating government websites	0.5
Interactive pages and short educational videos	1
Streaming radio	Less than 0.5
Phone calls (VoIP)	Less than 0.5
Standard streaming videos	0.7
Streaming feature movies	1.5
Basic video conferencing	1
HD-quality streaming movie or university lecture	4
HD video conference and telelearning	4
Game console connecting to the Internet	1
Two-way online gaming in HD	4 symmetrical
Lower definition telemedicine	0.6-1 symmetrical
HD Telemedicine (diagnostic imaging)	5-10+ symmetrical

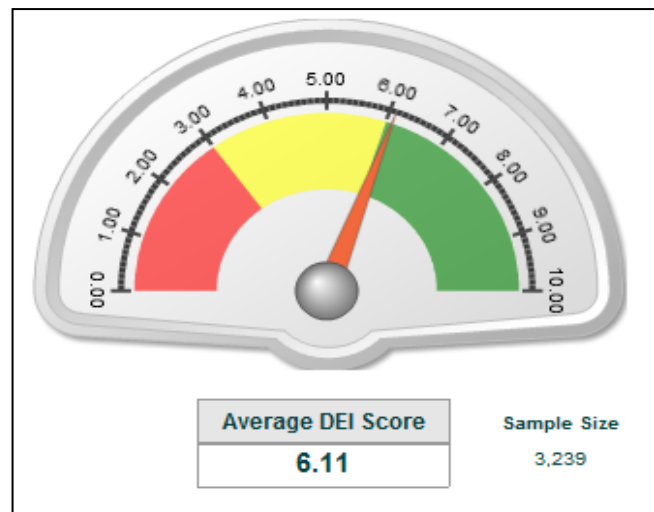
### 1.3 Introducing the Digital Economy index (DEi)

This report includes comparisons of Internet use between regions by various characteristics, such as industry, business size, and household demographics. To assist in the process of making comparisons, a mechanism was developed for establishing benchmarks. Benchmarks are useful in creating reference points against which the performance of any individual or group can be compared. Strategic Networks Group has developed a benchmarking process based on its Digital Economy index (DEi).

The Digital Economy index (DEi) reflects an organization’s or household’s utilization of a range of Internet applications and process: 17 for organizations and 30 for households. These applications and processes (eSolutions) are listed on the following pages. Based on the number of applications currently being used by an organization or household, a composite score is calculated that summarizes how comprehensively each organization or household uses Internet-enabled eSolutions. The DEi can be used to compare organizations, regions, or industry sectors. A separate DEi is used to compare how different types of households use the Internet.

An organization’s or household’s DEi Score (from 0 to 10) captures their utilization of eSolutions, with 10 being the highest possible use. DEi Scores are averaged across groups of users by various categories: e.g., a sector’s DEi is the average for all organizations in that sector. The DEi is used as a basis for comparison of utilization levels across various dimensions.

Identifying differences in DEi assists in focusing on areas where a deeper assessment is warranted. In areas where DEi is lower than average, indicating lower utilization, there is an opportunity to increase utilization and benefits to organizations and households.



*DEi Meter from dashboard of the Digital Economy Analytics Platform.*

**The Color Coding for DEi Scores:** To better show how industry sectors perform, the DEi tables in this report are color coded from the highest (**green**) to lowest (**red**) to highlight how DEi Scores compare. **The color coding (green to red)** allows one to quickly compare groups based on how utilization varies.

Highest
2
3
4
5
6
Lowest
Insufficient Data

DEi comparisons can be useful for different purposes, for example:

- Broadband planners and economic development agencies can compare DEi benchmarks between different types of organizations, e.g., industry sectors or size of businesses. This can provide insights into which businesses have low utilization and could benefit from “catching up” to their peers. They can also compare DEi benchmarks on a regional basis to prioritize geographic areas.

- Providers of broadband services and infrastructure can use DEi benchmarks to gain insights into where high utilization levels exist and where low utilization level need to be addressed in order to promote the greatest use from their broadband investments.

<b>eSolutions Categories for Households</b>	
<b>Communication</b>	<b>Transactions</b>
E-mail	Buying goods or services
Voice over IP	Selling items
Online chat	Investments / trading
Sharing information	Online banking
Personal website	Paying bills
<b>Productivity</b>	Government services
Education or training courses	Music or video download
Accessing workplace	Software download
Teleworking	Booking travel
Home business	<b>Research</b>
<b>Recreation</b>	Product information
News and sports	Investments
Listen to radio	Government information
Watch TV programs	Community events
Watch movies	Education and training
Online gaming	Health information
	Travel information

<b>eSolutions Categories for Organizations</b>	
<b>e-Commerce Related</b>	<b>e-Process Related</b>
Selling goods or services	Purchasing goods or services
Deliver services and content	Supplier communication and coordination
Rich media or service creation	Electronic document transfer
Customer service and support	Staff training and skills development
Advertising and promotion	Teleworking
Social networking	Accessing collaborative tools
Web site for organization	Banking and financial
Research by staff	Government transactions
	Access government information

## 2. Broadband Utilization by Organizations

Organizations differ in their utilization of broadband and Internet infrastructure depending on their industry sector, size, and access to technology and skills. This report explores how productive use of the Internet and eSolutions is related to the size of a community or region, the types of industry sectors that make up its economy, and the income, age, and education of its citizens. The data presented in this section show how the economic and demographic make-up of the regions of Illinois impacts their use of the Internet, as well as their ability to benefit from the potential that the Internet offers to communities, businesses, and households.

The beneficial impacts of utilizing the Internet are documented separately in the *Broadband Illinois eSolutions Benchmarking Technical Report (December 2012)* which highlights the impact of Internet utilization on business revenues and employment. The Illinois Benchmarking initiative provides strong support to the position that broadband connectivity, adoption and utilization have a major impact on job creation and revenue growth.

### 2.1 How regions differ in broadband utilization

At the broadest level, how do the regions of Illinois compare in their use of the Internet? Table 1 presents a high-level comparison. Not surprising, the Chicago region with its diverse economy and large metropolitan base shows the highest level of Internet utilization. Chicago is followed by the North Central and Northern regions at the top of the table. The southern and western regions all perform below average.

**TABLE 1: How Regions Rank in Internet Use (Commercial and Non-commercial Organizations)**

Region	Average DEi Score	Median DEi Score	Sample Size
Chicagoland	6.71	6.99	3,781
North Central	6.47	6.7	508
Northern	6.37	6.6	388
Northeast Central	6.4	6.41	318
Central	6.08	6.41	479
Southwest Central	6.11	6.31	344
Southern	6.21	6.21	379
West Central	6.05	6.21	309
Northwest	6.18	6.16	437
Southeast Central	5.96	6.16	310
<b>Illinois</b>	<b>6.47</b>	<b>6.7</b>	<b>7,253</b>

These rankings include commercial and non-commercial organizations across all industry sectors and employment sizes. To understand why the regions differ in their Internet utilization levels, it is very instructive to explore:

1. How utilization varies by industry and sector.
2. How employment size affects utilization.
3. How the degree of urbanization within each region is related to Internet utilization.
4. The Internet applications and processes that are slowest to be adopted.

### **2.1.1 Utilization by Industry**

Before diving into the details of how industry sectors perform and vary, it is useful to review the make-up of the regional and state economies in Illinois. This report uses U.S. Census Bureau (USCB) data<sup>4</sup> on annual payroll to gauge the importance of industry sectors for each region as this represents income that flows into the economy and indirectly reflects levels of employment.

Table 2 shows the 8 largest industry sectors (excluding Public Administration) within each region based on total annual payroll. The percentages of payroll, employment, and establishments represented by these top 8 industry sectors are included at the bottom of the table for reference. The top 8 industry sectors typically represent between 70% and 80% of the regional economies. The 2012 e-Solution Benchmarking database for Illinois has good data sets for all industry sectors in the table with the exception of Management of Companies.

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<sup>4</sup> Industries are based on 2-digit NAICS code level data from USCB County Business Patterns 2009. Full names of industries from NAICS definitions are abbreviated for this table. USCB County Business Patterns data does not include Public Administration (government). It should be noted that there can be significant difference in ranking of industries based on payroll vs. employment, e.g. Retail Trade tends to rank higher in employment due to comparatively lower wage rates, whereas Finance & Insurance ranks higher in payroll compared to employment.

**TABLE 2: Top 8 Industry Sectors by Region based on Total Payroll**

Rank	Central	Chicagoland	North Central	Northeast Central	Northern	Northwest	Southeast Central	Southern	Southwest	West Central
1	Health Care & Social Assistance	Professional & Technical Services	Finance & Insurance	Health Care & Social Assistance	Manufacture / Processing	Manufacturing / Processing	Manufacturing / Processing	Health Care & Social Assistance	Health Care & Social Assistance	Health Care & Social Assistance
2	Manufacture / Processing	Health Care & Social Assistance	Health Care & Social Assistance	Manufacture / Processing	Health Care & Social Assistance	Health Care & Social Assistance	Health Care & Social Assistance	Retail Trade	Manufacture / Processing	Manufacturing / Processing
3	Retail Trade	Finance & Insurance	Manufacturing / Processing	Retail Trade	Retail Trade	Retail Trade	Retail Trade	Manufacture / Processing	Retail Trade	Retail Trade
4	Construction	Manufacturing / Processing	Retail Trade	Wholesale Trade	Construction	Wholesale Trade	Wholesale Trade	Transport & Warehousing	Construction	Wholesale Trade
5	Finance & Insurance	Wholesale Trade	Wholesale Trade	Construction	Admin & Support Services	Transportation & Warehousing	Construction	Construction	Professional & Technical Services	Finance & Insurance
6	Wholesale Trade	Management of companies & enterprises	Construction	Finance & Insurance	Transport & Warehousing	Construction	Transportation & Warehousing	Finance & Insurance	Transport & Warehousing	Construction
7	Professional & Technical Services	Retail Trade	Administrative & Support Services	Information	Finance & Insurance	Finance & Insurance	Finance & Insurance	Wholesale Trade	Wholesale Trade	Hospitality & food services
8	Other services (exc. public admin)	Administrative & Support Services	Professional & Technical Services	Professional & Technical Services	Wholesale Trade	Professional & Technical Services	Hospitality & food services	Hospitality & food services	Hospitality & food services	Other services (exc. public admin)
% Payroll	79.3%	76.0%	83.1%	81.6%	83.4%	85.0%	86.7%	83.8%	75.4%	83.5%
% of Establish't	72.6%	61.3%	64.5%	62.4%	62.8%	64.0%	66.6%	65.2%	62.7%	76.9%
% of Employ'm't	72.8%	68.8%	74.5%	70.7%	74.9%	74.9%	85.6%	84.4%	74.2%	83.7%



Internet utilization varies by industry and region. Table 3 summarizes the level of utilization (its average DEi score) for each industry by region and statewide. Not surprisingly, the industry sectors with the highest utilization state-wide are Finance, Information, and Education. However, the ranking of industry sectors varies between regions. For example, Manufacturing is a leading sector in the Northwest and Southwest Central regions, well ahead of Manufacturing in Chicagoland.

**TABLE 3: Comparison of Utilization by Region and Industry (based on Average DEi Score)**

Major Industry Category	State-wide	Central	Chicagoland	North Central	Northeast Central	Northern	North-west	Southeast Central	Southern	South-west Central	West Central
Information	6.85	6.39	7.45	7.15	5.67	6.40	6.61	5.71	6.41	6.79	5.76
Finance & Insurance	6.82	6.53	6.99	6.96	7.52	6.58	6.06	6.34	7.32	6.37	6.73
Professional & Technical	6.70	6.56	6.82	7.04	6.38	6.75	6.17	6.18	6.35	6.85	5.03
Manufacturing / Processing	6.68	6.87	6.60	6.78	7.25	6.21	7.56	6.73	6.66	7.50	6.18
Retail Trade	6.64	6.53	6.75	6.63	6.48	6.76	6.50	7.12	7.26	5.80	6.19
Educational Services	6.48	6.13	6.62	6.96	6.95	6.90	5.93	6.55	5.99	6.38	6.13
Admin & Support	6.39	6.80	6.42	6.66	6.08	7.20	6.03			7.67	7.26
Construction	6.09	5.12	6.30	6.03	6.23	6.03	6.04	5.12	6.66	5.96	6.20
Healthcare & Social Assistance	6.09	5.27	6.29	5.66	5.83	6.61	5.37	6.21	5.95	5.66	6.29
Public Administration	5.38	4.95	6.03	4.96	5.77	5.57	5.03	4.53	4.97	4.83	4.70
Blank cells have insufficient data											

While the preceding table shows how different industry sectors compare to each other *within* a given region, it is also valuable to compare how a sector in one region compares to the same sector in other regions. This highlights the competitiveness and relative performance of a region and its' industry sectors. As noted earlier, the manufacturing sector in Chicagoland ranks 8<sup>th</sup> out of 10, while retail trade in the South and Southeast Central top the regional rankings. (Note: the top ranked region is rated "1" – green, with the lowest ranked region rated "10" – red).

**TABLE 4: Ranking of Industry Sectors across Regions**

Major Industry Category	Central	Chicagoland	North Central	Northeast Central	Northern	North-west	Southeast Central	Southern	South-west Central	West Central
Information	7	1	2	10	8	6	9	5	3	8
Finance & Insurance	6	3	4	1	7	10	9	2	8	5
Professional & Technical	5	3	1	6	4	9	8	7	2	10
Manufacturing / Processing	4	8	5	3	9	1	6	7	2	10
Retail Trade	6	4	5	8	3	7	2	1	10	9
Educational Services	7	4	1	2	3	10	5	9	6	7
Admin & Support	4	6	5	7	3	8			1	2
Construction	9	2	6	3	6	5	5	1	8	10
Healthcare & Social Assistance	10	2	7	6	1	9	5	4	7	2
Public Administration	7	1	6	2	3	4	10	5	8	9
Blank cells have insufficient data										

## 2.1.2 Differences in Utilization: Gaps and Opportunities

Differences in utilization of Internet applications and processes (referred to in this report as eSolutions) indicate areas with potential for improvement, given what peers (or competitors) are doing within the same industry sector. A low DEi Score suggests firms would benefit from exploring how eSolutions might improve performance – and could in fact be a sign of lack of competitiveness if, through lack of understanding of the benefits of eSolutions, the firm is missing out on opportunities.

**TABLE 5: Industries with Significant Differences in Utilization across Regions**

Industry	Regional differences between lowest and highest DEi	Rank of Industry by Size	Average DEi	Sample Size
Professional & Technical	<b>2.01</b>	6	6.70	992
Information	<b>1.78</b>	12	6.85	504
Admin & Support	<b>1.64</b>	5	6.39	230
Construction	<b>1.54</b>	11	6.09	346
Public Administration	<b>1.50</b>	N/A	5.38	531
Retail Trade	<b>1.46</b>	2	6.64	558
Finance & Insurance	<b>1.46</b>	7	6.82	440
Manufacturing / Processing	<b>1.38</b>	3	6.68	574
Healthcare & Social Assistance	<b>1.34</b>	1	6.09	513
Educational Services	<b>1.02</b>	14	6.48	829

In Illinois, some of the industry sectors with the greatest regional differences in utilization within that sector are also large components of the economy. Such differences in utilization should be priorities if firms are to compete outside their own regional markets, or if there is competition from outside their region, because they will be less competitive if they are using fewer eSolutions than firms elsewhere. However, the process of prioritizing an industry sector should also include assessing its potential for creating new jobs and protecting existing jobs. A competitive company is more likely to retain existing jobs and create new jobs, especially in an expanding industry. In this context, it is worth noting the jobs growth forecast to 2016 in

Illinois by Moody Analytics<sup>5</sup> that estimate Manufacturing's future growth to be very modest (unlike the last two years), while other areas such as Education and Health, Leisure and Hospitality, and Professional and Technical Services are projected to have healthy growth rates.

**Regions will benefit by closely examining the gaps and opportunities by industry sectors as part of their focused efforts to increase eSolution utilization for each region.** The following table identifies where the largest gaps in performance are by industry and region. Areas colored in red have the greatest gap, followed by those colored in orange have smaller but still notable gaps.

**TABLE 6: Lagging Industry Sectors: Gaps and Opportunities for Increasing Utilization by Region for Select Sectors**

Major Industry Category	Central	Chicago-land	North Central	Northeast Central	Northern	North-west	Southeast Central	Southern	Southwest Central	West Central
Educational Services	-0.35	0.14	0.48	0.47	0.42	-0.54	0.07	-0.49	-0.10	-0.34
Finance & Insurance	-0.29	0.17	0.14	0.70	-0.24	-0.76	-0.48	0.51	-0.45	-0.09
Health Care & Social Assistance	-0.83	0.19	-0.44	-0.26	0.51	-0.73	0.12	-0.15	-0.43	0.19
Information	-0.46	0.60	0.29	-1.18	-0.46	-0.24	-1.14	-0.45	-0.06	-1.10
Manufacturing / Processing	0.20	-0.08	0.10	0.57	-0.47	0.88	0.06	-0.01	0.83	-0.50
Professional & Technical Services	-0.14	0.12	0.34	-0.32	0.05	-0.53	-0.52	-0.35	0.15	-1.67
Public Administration	-0.43	0.65	-0.42	0.39	0.19	-0.35	-0.85	-0.41	-0.55	-0.68
Retail Trade	-0.11	0.11	-0.01	-0.16	0.12	-0.14	0.47	0.62	-0.84	-0.45
# of large gaps 1 (0.6 or more below the state DEi)	1	0	0	1	0	2	2	0	1	3
# of small but notable Gaps (0.6 to 0.3 below statewide DEi)	3	0	2	1	2	3	2	4	3	3

<sup>5</sup> See <http://usatoday30.usatoday.com/money/economy/story/Jobs-Forecast-2011/34083932/1>

*Recommendation #1: Each region must develop its own strategy and initiatives based on its own characteristics, values, and priorities.*

In the twenty-first century, broadband access is an essential part of a region's infrastructure, a business's operations, and a household's participation in their community life. Availability and meaningful use of broadband speaks directly to a community's viability, competitiveness, and quality of life. However, each region and community has its own unique characteristics, assets, and challenges. Each region requires strategies and initiatives that address its unique situation.

*Recommendation #2: Rather than undertaking broad but untargeted initiatives focus, on industries that have the highest economic contribution and highest growth potential within each region.*

Industry utilization levels vary significantly across the regions. Even lagging regions lead in some industries while leading regions are behind in others. Where industry utilization lags in a region there is an opportunity to increase utilization levels and thereby increase competitiveness, revenues, and job creation. The lagging industries for Internet utilization in each region are identified in this report. Setting priorities by industries should also take into consideration the size and importance of each industry to the region.

## 2.2 How Sectors Differ in Broadband Utilization

It is important to differentiate between organizations by their purpose. How an organization manages internal and external relationships (communications, transactions, etc.) is a key factor in how it uses the Internet and various eSolutions. Table 7 shows average (median) Internet utilization as expressed in DEi Scores for each of three broad organizational sectors: commercial, governmental, and non-profit. Given that competitive forces and customer demand drive usage of eSolutions by commercial entities, it is not surprising that the commercial sector has the highest median DEi Score (6.80). More surprising is that the non-profit sector's utilization is very close to that of the commercial sector (6.70).

**TABLE 7: Average Internet Utilization by Sector**

Sector	Median DEi Score	Sample Size
Commercial	6.80	4,621
Non-Profit	6.70	1,133
Government	6.31	1,499

While Table 7 shows that the average government entity has lower utilization (as measured by DEi) than the other two sectors, closer examination in Table 8 shows that the government sector has its own sub-sectors, each with very different Internet utilization. In fact, the average State and federal government entity has a higher DEi Score (7.04) than the average commercial entity (6.80). The relatively high DEi of state and federal government entities is more than offset by the low scores of local government and public safety organizations, which have the lowest utilizations of all non-commercial sub-sectors.

**TABLE 8: Average Utilization by Community Anchor Institution (CAI) Sub-Sector**

CAI Sector	Median DEi Score	Sample Size
Colleges	8.16	111
University or Trade School	8.06	117
Economic Development Agencies	7.18	111
Labor Force Training	7.09	48
State and Federal Government	7.04	107
Library	6.60	309
Other Community Service	6.60	403
K to 12	6.51	684
Health	6.51	400
Local Government Entity <sup>6</sup>	5.92	444
Public Safety	5.24	171

<sup>6</sup> The sample size for local government entities in this report is higher than the local government sample used in the eSolutions Benchmarking Technical Report. The latter report analyses utilization by county and municipal governments. This eStrategy Report also includes other local government entities in its analysis.

One notable aspect of Internet utilization by Community Anchor Institutions (CAIs) is the apparent impact of location. Table 9 provides the DEi Scores for sub-sectors where there is a discernible difference in utilization between organizations in metropolitan areas (population greater than 50,000), compared to those located outside of metropolitan areas. For example, libraries in non-metro areas had a DEi Score of 5.53 compared to a DEi of 7.09 for libraries in metropolitan areas. In practical terms, this means that the average non-metro library used about 2.5 less Internet enabled eSolutions (out of 17) than their metro peers. The issue of location is explored in more depth in the next section.

**TABLE 9: Difference in Utilization between Metro and Non-Metro CAIs**

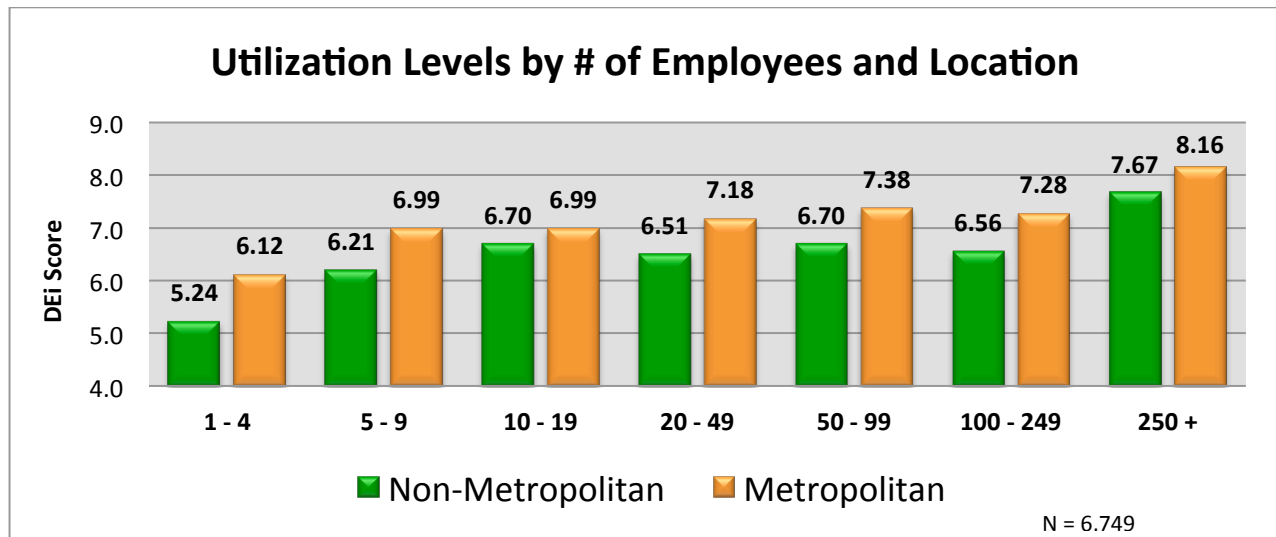
CAI Sector	Metro Median DEi Score	Sample Size	Non-Metro Median DEi Score	Sample Size	Difference
Public Safety	5.44	119	4.85	51	0.59
Local Government Entity	6.41	298	5.00	144	1.41
Economic Development Agencies	7.67	61	5.24	50	2.43
Library	7.09	195	5.53	113	1.56
Other Community Service	6.89	293	5.92	103	0.97
K to 12	6.70	454	6.02	228	0.68
Health	6.60	286	6.12	110	0.48

*Recommendation #3: Community Anchor Institutions in non-metropolitan areas should be a priority. Particular attention should be given to local government and public safety entities, as well as libraries and economic development agencies.*

## 2.3 What Contributes to the Different Levels of Utilization?

A number of factors help to explain differences in utilization between organizations and between regions. Location of an organization in a non-metropolitan area is one such factor. Organizations outside of a metropolitan area do not benefit from the dense network of supports and skilled labor pools. Consequently, as Table 10 shows, smaller organizations located outside of a metropolitan area<sup>7</sup> experience a distinct disadvantage, with lower levels of utilization of eSolutions. This factor partly explains why three of the least metropolitan regions of Illinois (see Table 11) have lower Internet utilization.

**TABLE 10: Impact of Location on Utilization, by Size of Organization**



**TABLE 11: Distribution of Respondent Sample by Settlement Pattern**

Type of Settlement Pattern	Metropolitan	Micropolitan	Small Town	Isolated Small Town
Central	63%	16%	16%	5%
Chicagoland	100%	0%	0%	0%
North Central	76%	6%	6%	13%
Northeast Central	79%	0%	15%	5%
Northern	80%	13%	6%	1%
Northwest	26%	37%	24%	14%
Southeast Central	3%	32%	57%	8%
Southern	1%	50%	38%	12%
Southwest Central	84%	1%	15%	1%
West Central	2%	71%	16%	11%

<sup>7</sup> A metropolitan area is defined by the Census Bureau as having a core urban area of over 50,000 with a population density greater than 1,000 people per square mile. A Micropolitan area has a population of 10,000 to 49,999. A small town has a population of 2,500 to 9,999. The category of “isolated small town” includes the remainder.



Table 10 highlights a second important factor, organizational size. Average utilization increases for organizations with larger numbers of employees. The pattern of lower utilization by smaller firms appears related to the greater resources available to larger entities, as evidenced later in the report’s section on barriers to utilization. The importance of organizational size as a factor in eSolutions utilization is highlighted by the fact that almost 95 percent of establishments and 42.9 percent of employment across Illinois comes from organizations with 1 to 49 employees. Lower utilization among this major segment provides a strong argument for making this segment a focus for promoting broadband utilization. Using data from the 2009 U.S. Census, the following table demonstrates the importance of smaller organizations to the regional and state economies.

**TABLE 12: Number of Establishments by Employment Size Range** (USCB County Business Patterns 2009)

	1 to 19	20 to 49	50 to 99	100 to 499	500 +
Central	87.1%	8.3%	2.7%	1.7%	0.2%
Chicagoland	86.2%	8.2%	3.0%	2.3%	0.3%
North Central	85.4%	9.1%	3.1%	2.1%	0.2%
Northeast Central	86.5%	8.5%	2.9%	2.0%	0.1%
Northern	85.8%	8.7%	3.1%	2.2%	0.2%
Northwest	87.5%	7.8%	2.7%	1.9%	0.2%
Southeast Central	88.8%	7.0%	2.3%	1.7%	0.2%
Southern	88.9%	7.4%	2.2%	1.3%	0.2%
Southwest Central	86.8%	8.7%	2.6%	1.6%	0.2%
West Central	88.0%	7.4%	2.8%	1.6%	0.2%

The small to medium enterprise (SME) segment is a significant component of statewide and regional economies and tends to be a primary source of new job growth. This segment has the greatest opportunity to increase utilization levels for productivity and competitiveness, as demonstrated later in this report. Larger organizations in general have had access to information and communications technology (ICT) for much longer periods and have the internal resources to take advantage of these technologies, resulting in higher utilization. As such, larger organizations are less likely to be influenced by external broadband adoption and utilization initiatives and already have high utilization levels.

*Recommendation #4: Focus on the small-medium enterprise segment, especially 1-19 employees, to increase Internet utilization, drive competitiveness, revenues, and job creation.*

Small to medium sized organizations should be a focus for all regions for the following reasons:

- Largest number of establishments (95%) and significant employment (43%)
- Lowest utilization level compared to larger employment segments
- Dynamic engines for employment growth, especially through use of the Internet
- Least capacity and expertise to adopt more sophisticated Internet applications

**Where Utilization Differences Occur in SME Organizations:** Some processes and applications are easier to adopt than others, such as electronic document transfer, staff research, and accessing government information. Adoption levels of these utilizations are high and there is not much difference between sophisticated and less sophisticated users.

While some smaller enterprises may not aspire to the utilization levels of large organizations and some types of utilization may be less appropriate for small organizations, it is instructive to observe where the differences lie in utilization between small and large organizations. The utilization levels of larger organizations provide potential targets for smaller organizations to achieve. Table 13 shows utilization levels of different eSolutions for different sizes of organizations: 0-19 employees, 20 to 99 employees, and 100 or more employees.

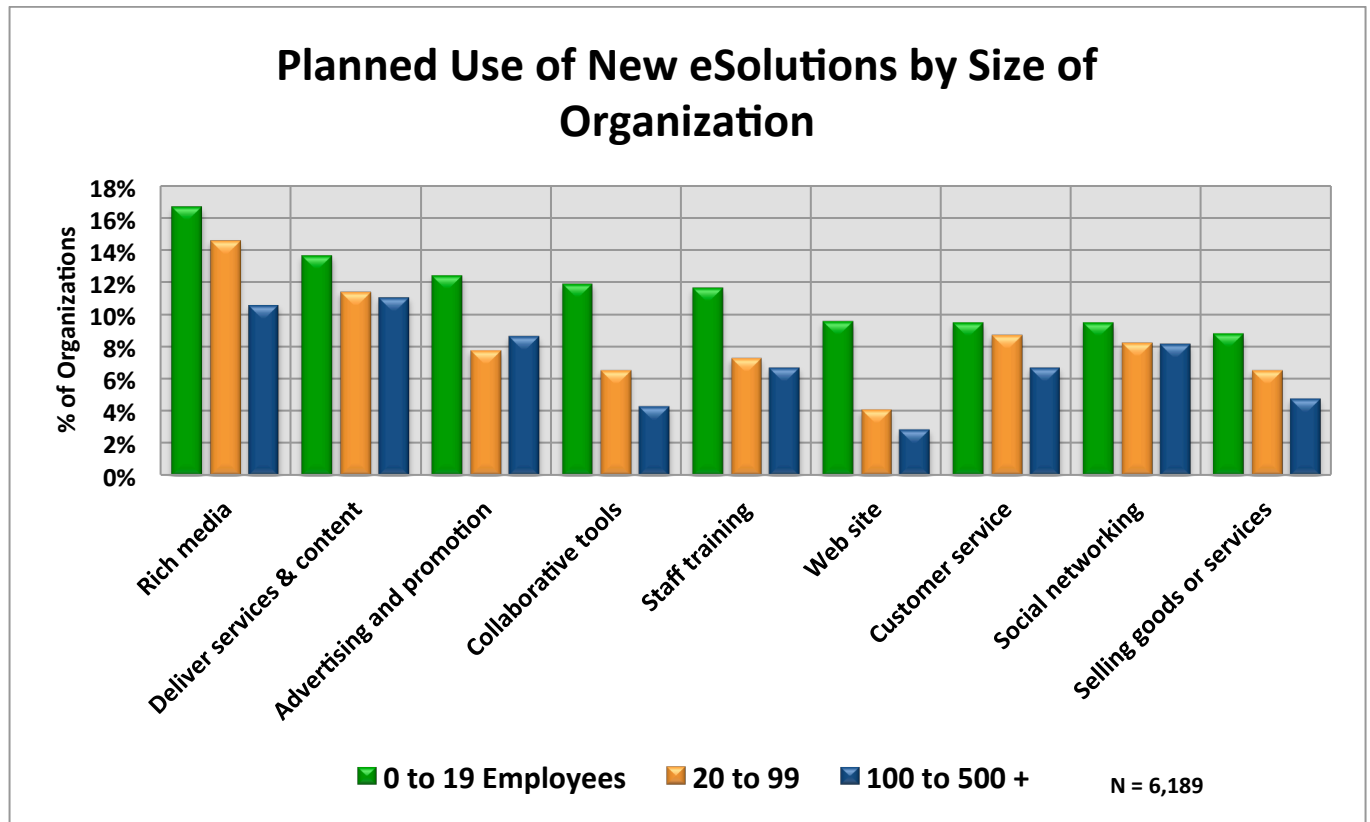
With some notable exceptions (banking, buying online, selling online, and social networking), smaller organizations have lower utilization of eSolutions than larger organizations.

**TABLE 13: Difference in Utilization of Specific eSolutions by Size of Organization**

Currently Used Applications and Processes	0 to 19	20 to 99	100 +
Web site for organization	80.9%	91.9%	91.9%
Research by staff	87.1%	87.6%	91.2%
Electronic document transfer	85.7%	89.5%	91.1%
Access government information	82.0%	89.1%	90.7%
Staff training and skills development	62.5%	80.9%	87.7%
Accessing collaborative tools	60.6%	73.1%	84.9%
Supplier coordination	75.7%	78.6%	80.7%
Purchasing goods or services	80.0%	78.9%	80.0%
Government transactions	63.6%	72.0%	77.2%
Customer service and support	65.1%	64.2%	69.6%
Rich media or service creation	38.1%	50.7%	66.8%
Social networking	62.6%	64.9%	64.2%
Teleworking	45.2%	54.7%	61.2%
Advertising and promotion	59.8%	63.0%	60.7%
Deliver services and content	38.4%	45.6%	59.8%
Banking and financial	70.7%	64.1%	55.3%
Selling goods or services	48.4%	43.4%	43.9%

While on average, smaller organizations use the Internet less than larger ones, many smaller organizations are already planning to address these gaps, as seen in Table 14, which shows which eSolutions organizations were planning to adopt within the next 12 months.

**TABLE 14: Planned Adoption of Specific eSolutions by Organization Size**



By combining data from the two previous tables, an assessment can be made of which opportunities offer the greatest potential for small businesses and organizations. It is also possible to identify which of these opportunities are most evident to smaller businesses and organizations and which opportunities remain under appreciated. Table 15 on the following page identifies areas with the greatest difference in utilization between organizations of different sizes, along with the percentage of organizations with 0 to 19 employees that plan to adopt an eSolution that they are currently not using. Areas with a high level of difference in utilization and high levels of planned use can indicate areas where organizations need help and are looking for resources. Fortunately, the areas with the highest difference in utilization all fall into this category.

Areas with high difference in utilization and low planned use indicate areas where greater awareness raising may be needed. Teleworking falls into this category.

**TABLE 15: Identifying eSolutions with Greatest Differences in Utilization and Planned Use**

Currently Used Processes or Applications	Difference In Utilization between Organizations Small (0 to 19 employees) and Large (100 or more) (by percent points)	Planned Use by Small Organizations (1 to 19 employees)
Rich media or service creation	28.7%	17.9%
Staff training and skills development	25.2%	12.4%
Access Collaborative Tools	24.3%	13.2%
Deliver services and content	21.4%	15.1%
Teleworking	16.0%	8.9%
Government transactions	13.6%	7.0%
Web site for organization	11.0%	9.0%
Access government information	8.7%	4.7%
Electronic document transfer	5.4%	5.0%
Supplier communication and coordination	5.0%	4.6%
Customer service and support	4.5%	10.6%
Research by staff	4.1%	3.8%
Social Networking	1.6%	10.7%
Advertising and promotion	0.9%	14.0%
Purchasing goods or services	0.0%	5.7%
<i>Selling goods or services</i>	-4.5%	9.8%
<i>Banking and financial</i>	-15.4%	5.7%

\* Difference between current utilization levels by highest using group in Table 10 and the lowest using group. Italics indicate where highest using group was in the 1-19 employees group.

## 2.4 The Adoption Process

Many types of utilization are more complex and sophisticated, making the process of adoption slower by organizations in general and by smaller organizations in particular. The chart on the next page shows the rate that each type of utilization is adopted by organizations relative to DEi Scores. For example, with a state-wide average DEi of 6.47, approximately 80 to 90 percent of “average” users will be currently using the “quick to adopt” applications and processes noted below. In contrast, only 30 to 45 percent of “average” users will be currently using the “slow to adopt” eSolutions.

Quick to adopt eSolutions	Slow to adopt eSolutions
Access government information	Teleworking
Electronic document transfer	Rich media or service creation
Purchasing Goods and Services	Selling goods or services
Research by staff	Deliver services or content
Web site	Advertise and promote online

**TABLE 16: Slow and Late Adoption of eSolutions by Level of User Sophistication**

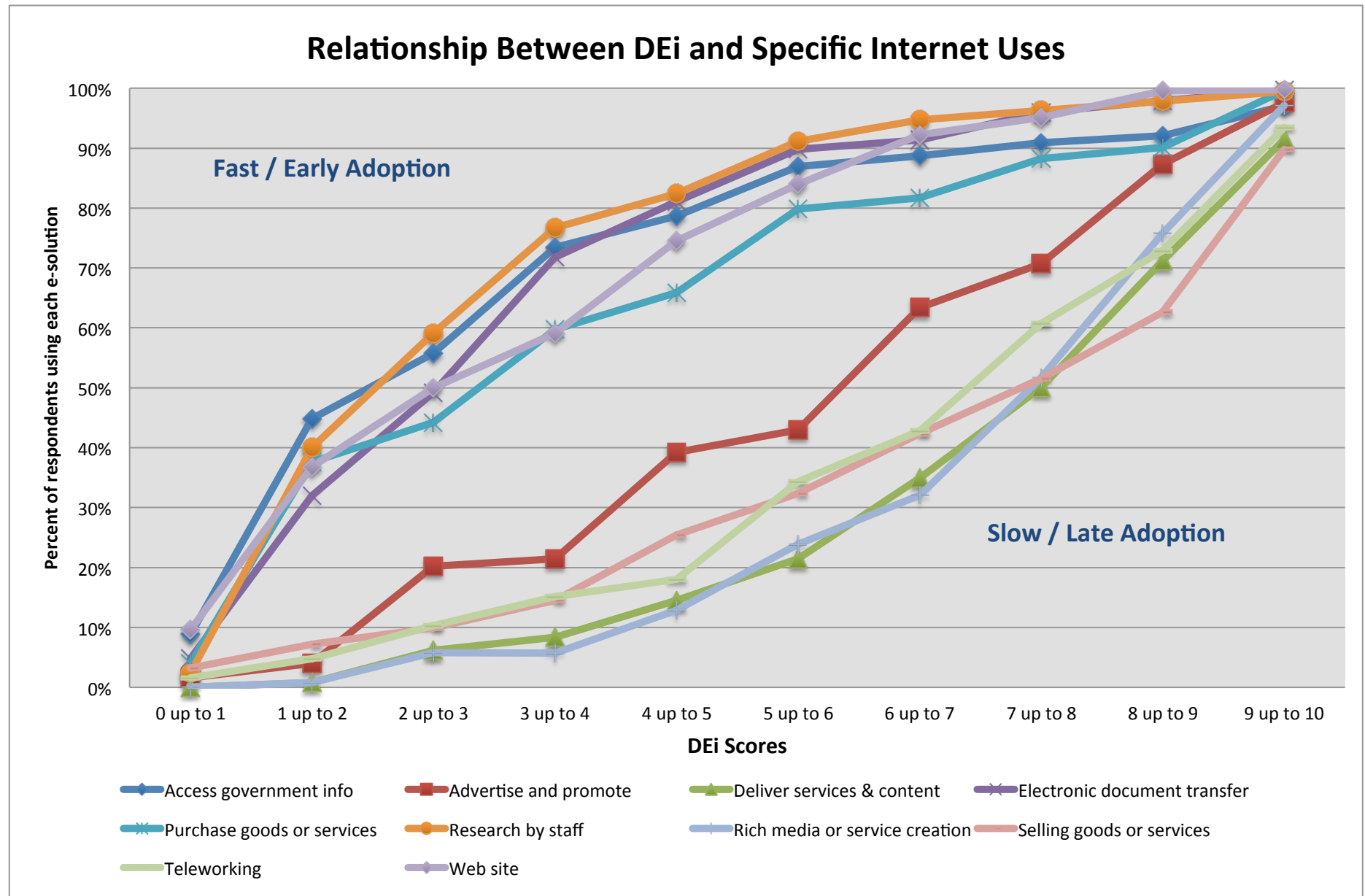


Table 16 above shows that there are eSolutions that are more quickly adopted (Access government information, Teleworking, etc.). Slow to late adoption eSolutions (Delivering services and content, Selling goods and services online, etc.) require an understanding of how these eSolutions will benefit business operations, along with resources and skills for effective implementation - which costs more and takes more time to implement, but SNG research shows that these eSolutions have the biggest impact on revenues, cost savings, and improved business relationships (customers, partners, etc.).

*Recommendation #5: Initiatives aimed at increasing utilization among the small to medium enterprise segment should focus on the following 10 utilization categories:*

- 1. Delivery of services and content*
- 2. Rich media or service creation*
- 3. Teleworking*
- 4. Selling goods or services*
- 5. Advertising and promotion*
- 6. Staff training and skills development*
- 7. Social networking*
- 8. Accessing collaborative tools*
- 9. Customer service and support*
- 10. Supplier communication and coordination*

Once industries and segments are targeted for each region, the specific utilization categories that represent gaps and opportunities should be targeted.

## 2.5 Barriers to Improved Utilization

The preceding analysis has identified which industry sectors in which regions have the greatest gaps in Internet utilization. As well, additional information has been provided on factors that can aid in prioritizing industry sectors, such as the size of organization. Evidence has also been provided on which specific areas (applications and processes) these industry sectors and priority groups are lagging. Lastly, there is evidence on the importance of the Internet to the competitiveness and health of regional economic development, including achievement of such objectives as job creation. Before a plan can be designed to support these priority groups it is important to understand the barriers to adoption of eSolutions. The following table identifies the importance of a range of factors in inhibiting the adoption and use of eSolutions by organizations.

**TABLE 17: Barriers to Adoption of eSolutions – Regional Comparison to Statewide Averages**

Barriers to using eSolutions by Businesses with 1 to 49 employees	State-wide	Central	Chicago-land	North Central	Northeast Central	Northern	North-west	South-east Central	Southern	Southwest Central	West Central
Security concerns	73.8%	73.9%	72.8%	75.3%	75.5%	74.1%	78.8%	77.1%	72.4%	79.5%	69.2%
Privacy concerns	61.5%	63.9%	60.0%	64.7%	59.1%	62.4%	64.1%	66.7%	65.4%	64.8%	59.8%
Loss of personal client contact	56.7%	59.4%	56.0%	57.4%	58.2%	55.9%	56.4%	63.8%	46.5%	63.9%	57.3%
Lack of internal expertise	49.8%	56.6%	47.5%	56.3%	58.2%	50.0%	53.8%	47.6%	51.2%	50.8%	48.7%
Development/maintenance costs	49.6%	55.0%	47.1%	55.3%	58.2%	51.8%	52.6%	55.2%	48.0%	51.6%	48.7%
Available Internet is too slow	43.1%	47.2%	39.5%	46.8%	49.1%	42.4%	50.0%	59.0%	55.1%	44.3%	41.9%
Products not suited to Internet	37.4%	42.7%	37.2%	32.6%	37.3%	41.8%	34.0%	35.2%	34.6%	45.9%	32.5%
Uncertain about benefits	30.8%	26.6%	28.4%	33.7%	34.5%	35.9%	35.9%	38.1%	30.7%	38.5%	35.9%
Suppliers not ready	29.0%	32.3%	28.0%	31.1%	24.5%	30.6%	32.1%	30.5%	28.3%	30.3%	29.9%
Internal organization resistance	26.1%	31.1%	24.6%	31.6%	30.0%	25.9%	23.7%	31.4%	25.2%	27.9%	26.5%
Sample Size	2,990	180	1,709	190	110	170	160	105	127	122	117

\*Color coding highlights where regional difference from state average is 5 percentage points or higher.

The importance of barriers varies to only a limited extent from region to region. The **top 5 barriers** that are important factors for more than 45 percent of organizations are: 1) security concerns; 2) privacy concerns; 3) loss of personal contact with clients; 4) lack of internal expertise and knowledge and; 5) high cost of development / maintenance. Two issues that stand out as having the greatest difference between regions are slow Internet and uncertainty over benefits of using Internet applications. The Southeast Central region reports a higher incidence on 5 out the 10 barriers.

## 3. Households

### 3.1 Overview

It is not only Internet utilization by businesses and other organizations that varies across regions. Utilization by households varies as well. This has implications for delivery of government services, self-employment, and access to a range of Internet based services, both commercial and non-commercial. So, to what degree are there differences in household utilization of the Internet across Illinois? As the following table shows, Chicagoland, Northern, and West Central regions have a distinctly higher level of utilization compared to the other regions. Southeast Central has the lowest score, with most regions clustered in the middle. It is worth noting that a region's utilization of the Internet does not necessarily follow its level of adoption. While in most cases low utilization and low adoption follow similar trends, the West Central Region has relatively low adoption rates, but relatively high utilization by those who have adopted the Internet.

**TABLE 18: Household Utilization (DEi) by Region**

Region	Median DEi Score	Diff. from Median	# Households
Chicagoland	6.86	0.32	515
Northern	6.80	0.26	84
West Central	6.73	0.19	153
Northeast Central	6.47	-0.07	150
Northwest	6.47	-0.07	145
Southwest Central	6.47	-0.07	197
North Central	6.47	-0.07	190
Southern	6.47	-0.07	271
Central	6.35	-0.19	203
Southeast Central	6.06	-0.48	221
Illinois	6.54		2,129



### 3.2 Explaining Differences in Household Utilization

Some of the difference in household utilization is a result of factors that impact all regions. These important factors include household income and age. The following chart shows the cumulative impact of age and income on utilization as expressed by DEi Scores.

**TABLE 19: Household Utilization (DEi) by Age and Income**

Respondent Age	Household Income			
	Less than \$30,000	\$30,000 to \$49,999	\$50,000 to \$100,000	More than \$100,000
18 to 34 years	6.74	6.96	7.35	7.98
35 to 54 years	6.19	6.07	6.71	7.43
55 to 64 years	4.62	5.60	6.42	6.55
65 years and over	4.02	4.91	5.60	6.44

The trend of increasing utilization with higher household incomes is consistent for all regions. Similarly, the trend for decreasing utilization over the age of 55 is consistent for all regions. Note: income seems to be the most significant factor influencing use. While age is important as well, the impact of age seems most pronounced for lower income households and less so for financially better off households.

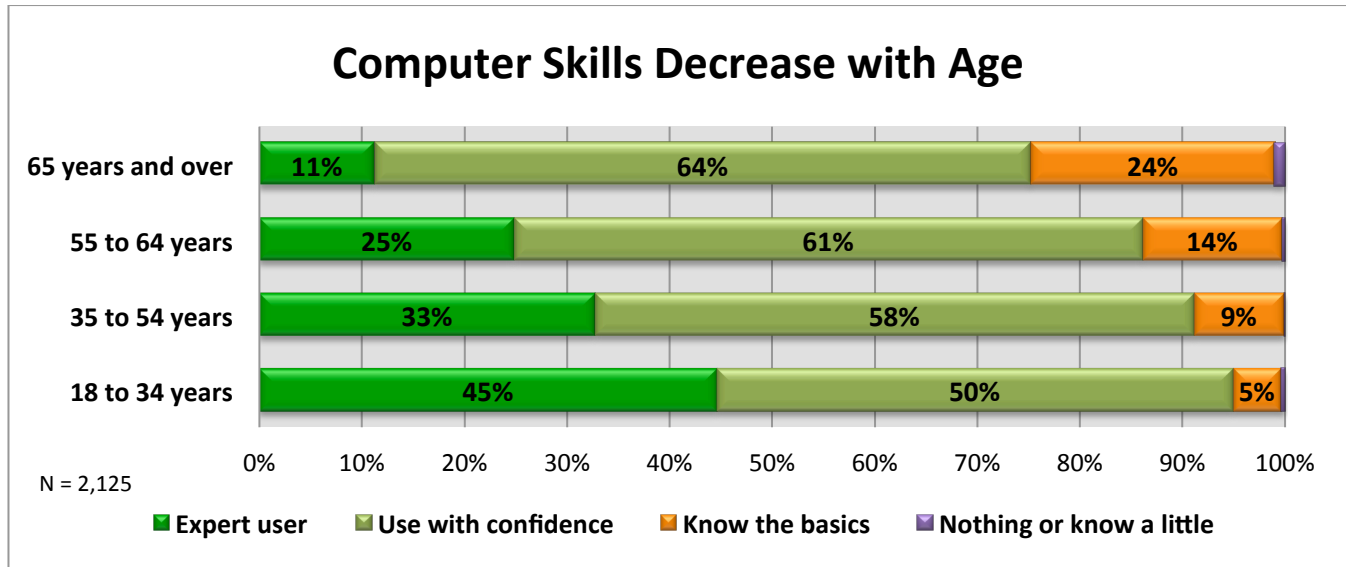
Given the impact of income and age on utilization, it is useful to acknowledge the different age and income profiles of the ten regions. Chicagoland stands out as having a significantly higher than average median income and lower percentage of population aged 65 and older. The Southern, Southeast Central, and West Central regions are notable for their combination of well below average median incomes and their higher than average incidence of population aged 65 and older. The West Central region runs counter to the pattern, with relatively high utilization, in spite of lower average incomes and a large elderly population.

**TABLE 20: Household Income and Age by Region (US Census Bureau)**

Region	Median Household Income	% of Population 65 +
Chicagoland	\$59,946	11.3%
North Central	\$51,658	14.1%
Southwest Central	\$49,844	13.7%
Northwest	\$48,970	17.0%
Northern	\$47,747	13.4%
Central	\$47,078	15.8%
Northeast Central	\$42,674	13.1%
West Central	\$40,730	17.5%
Southeast Central	\$40,594	16.5%
Southern	\$37,024	16.7%
<b>State</b>		<b>12.5%</b>

Computer skills are an important factor that directly affects levels of utilization with individuals 55 and older having noticeably lower skill levels.

**TABLE 21: Computer Skills by Age**



Computer skill levels vary to a limited degree by region, with the Northern region having the highest incidence of expert users.

**TABLE 22: Utilization (DEi) and Computer Skills by Region**

Region	Computer Skill Level		
	Expert user	Use with confidence	Know the basics
Central	7.10	6.09	4.45
Chicagoland	7.55	6.44	5.12
North Central	7.12	6.20	4.15
Northeast Central	7.12	6.18	4.71
Northern	7.61	6.32	4.37
Northwest	6.37	6.31	5.05
Southeast Central	7.03	5.71	5.26
Southern	6.88	5.95	4.62
Southwest Central	7.36	5.90	4.28
West Central	7.27	6.20	4.35

*Recommendation #6: Develop training programs and resources that target lower to middle income households over the age of 64.*

Households with low computer skills represent an important group due to the social and economic benefits that can be accessed through the Internet. As governments and businesses move their services to the Internet to achieve better reach and cost efficiencies, it is critical that citizens have the ability to access and benefit from these online services. However, a large portion of lower income and older households have difficulty adopting and using the Internet. Given that low adoption and utilization is strongly tied to age and income, training should be targeted at people over 64 with low to moderate income.

**Location Matters:** Similar to organizations, household use of eSolutions is impacted by whether a household lives in a metropolitan area<sup>8</sup> or not. The following table shows metropolitan (essentially urban) households to have, on average, markedly higher utilization of eSolutions. Using categories developed by the U.S. Census Bureau, which are based on population size, density, and commuting patterns, Table 23 shows that more urbanized areas have higher levels of Internet utilization. Part of this difference in utilization levels between metropolitan and non-metropolitan areas can probably be attributed to the lower average incomes and higher incidence of older individuals in rural areas. Lower levels of educational attainment in rural areas are also likely to be a contributing factor.

**TABLE 23: Rural - Urban Household Utilization for All Types of Connectivity**

Rural-Urban Category	Median DEi Score	# Households
Metropolitan	6.73	1,151
Micropolitan	6.6	416
Small Town	6.35	398
Isolated Small Town	5.96	146

*Recommendation #7: Non-metropolitan areas are a priority for Internet training programs and resources.*

While both urban and rural households struggle to use and benefit from the Internet, rural households are relatively disadvantaged, being generally older and having lower average incomes. Lastly, rural households tend to have greater difficulty in accessing educational, health and government services, all of which are increasingly available online.

<sup>8</sup> A metropolitan area is defined by the Census Bureau as having a core urban area of over 50,000 with a population density greater than 1,000 people per square mile. A Micropolitan area has a population of 10,000 to 49,999. A small town has a population of 2,500 to 9,999. The category of “isolated small town” includes the remainder.

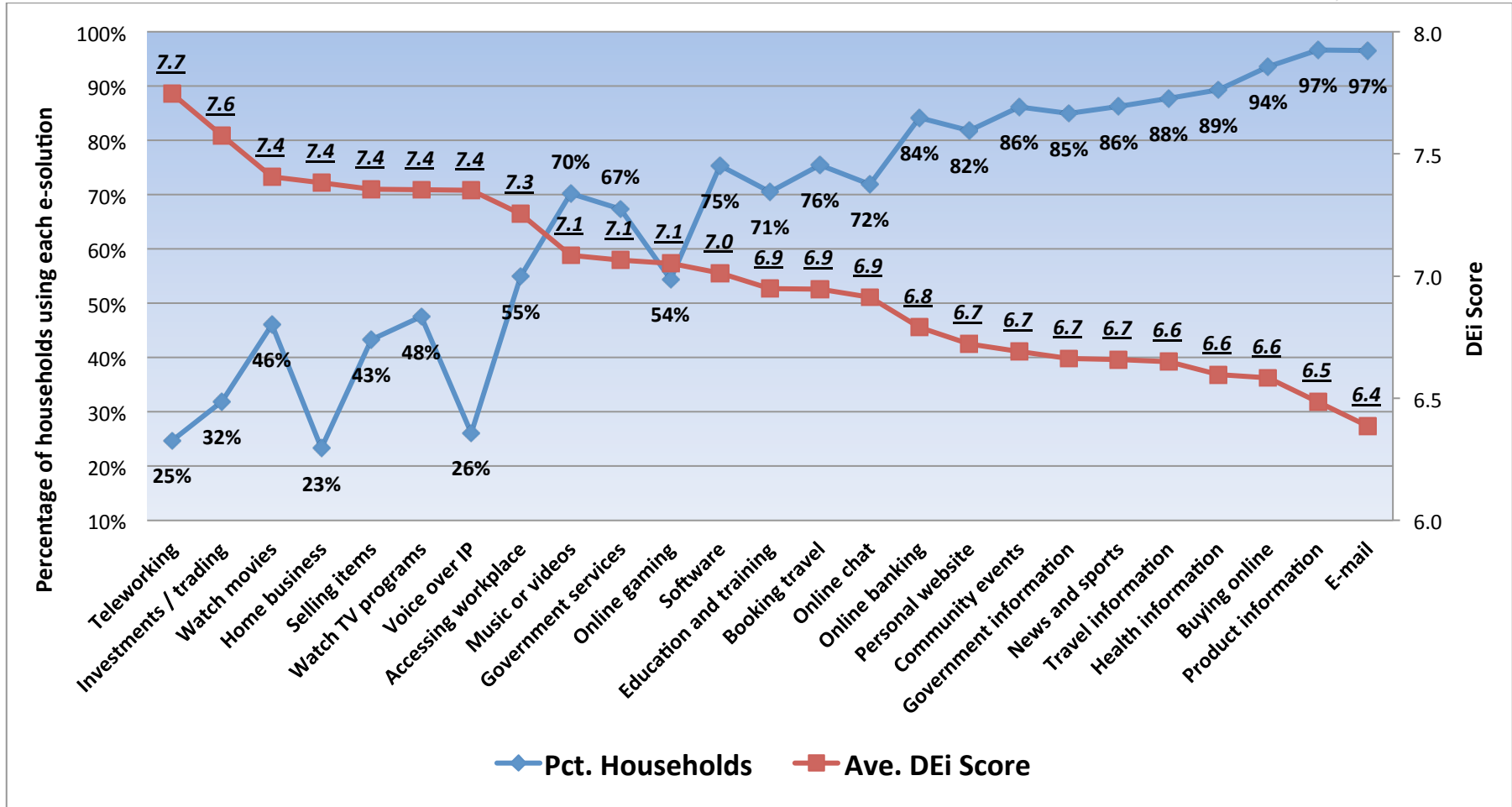
### 3.3 eSolutions with High Difference in Utilization Levels

Many types of Internet utilization by households are more complex and sophisticated in nature, requiring above average skill levels. These complex eSolutions tend to be slower to be adopted. The chart on the next page shows the rate that each type of utilization is adopted by households relative to their individual DEi Score. For example, approximately 86 to 97 percent of users will be currently using the “quick to adopt” applications and process noted below. In contrast, less than a third of users will be currently using more sophisticated and difficult applications which tend to be adopted later, especially by those that already have high utilization.

Quick to adopt eSolutions	Slow to adopt eSolutions
E-mail	Teleworking
Obtain product information	Home-based business
Buy online	Voice over IP
News and sports	Investing online
Health information	
Travel Information	

TABLE 24: Patterns of Adoption and Household DEi

Increasing Percentage of Households Using



Increasing Level of Sophistication and Higher DEi

### 3.4 The Impact of Lower Utilization on Households

Looking at the different regions in Illinois, it is clear that regions with the lowest skill levels and utilization have the lowest use of the Internet for personal productivity and earning income. The following table shows how regions perform in four areas that have major impact on employment and earning income. Areas shaded in green have higher than average utilization, while those in red have lower than average utilization. Chicagoland has high usage in telework and accessing the workplace. With relatively small sample sizes, the differences between regions need to be treated with caution.

**TABLE 25: Percentage of Houses Currently Using Internet for Productivity Uses**

Productivity Category	Home business	Education or training courses	Teleworking	Accessing workplace	Sample Size
Central	24.7%	36.8%	23.2%	54.2%	202
Chicagoland	21.9%	44.1%	35.3%	63.0%	515
North Central	18.9%	42.9%	20.6%	57.1%	190
Northeast Central	25.2%	38.5%	26.6%	55.9%	150
Northern	26.3%	46.1%	25.0%	52.6%	84
Northwest	29.1%	50.7%	24.6%	50.0%	145
Southeast Central	21.8%	42.7%	16.0%	44.7%	222
Southern	23.4%	46.9%	17.2%	46.9%	271
Southwest Central	24.9%	47.6%	22.2%	57.8%	197
West Central	22.0%	48.2%	23.4%	56.7%	153

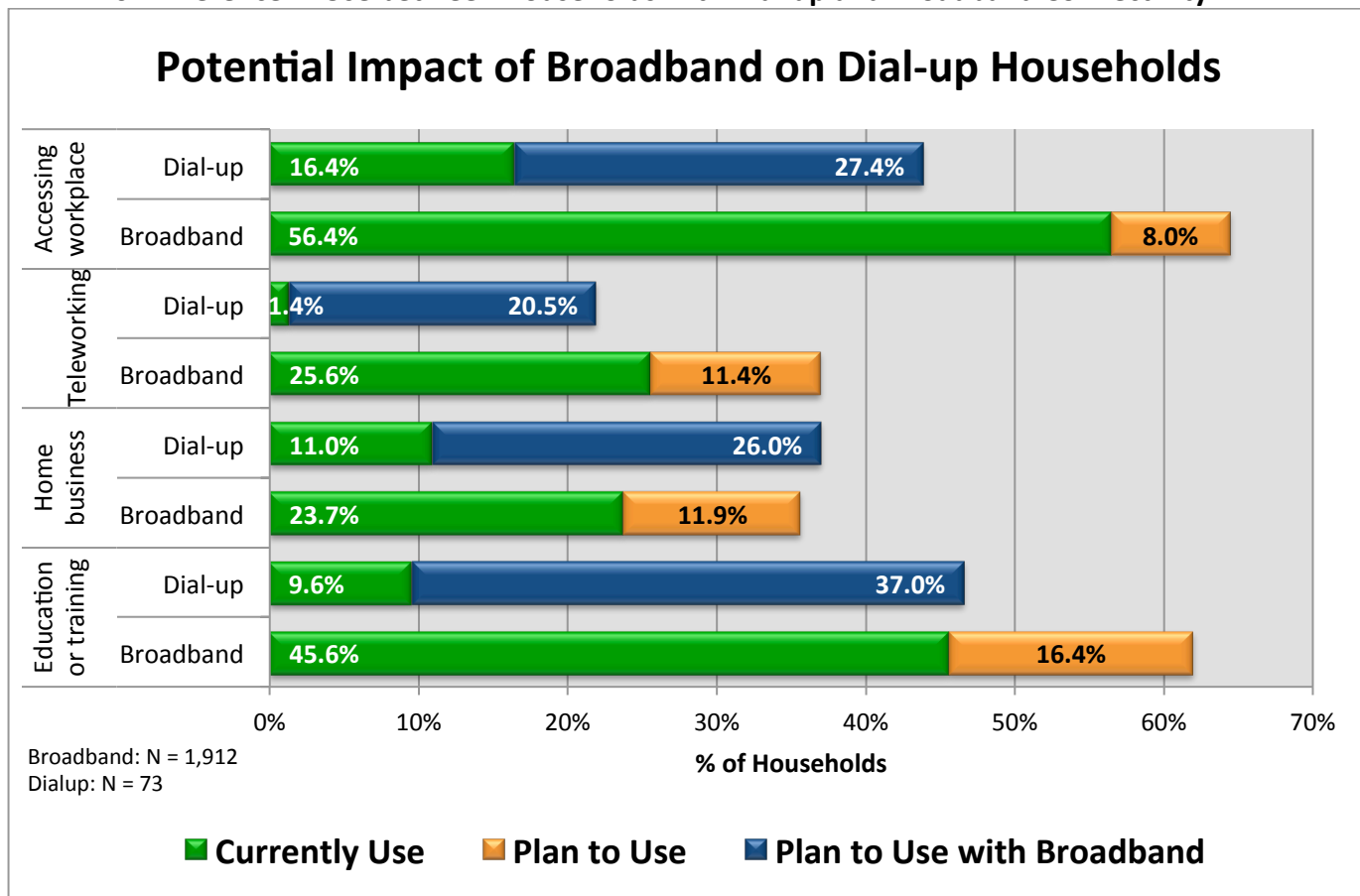
Table 25 illustrates the impact that utilization has on the economic well-being of households. The ability to accessing training, start one’s own business and access work remotely is increasingly important to work force participants as they adjust to an increasingly knowledge based economy. Areas with poor broadband access, low adoption, or weak utilization are at a severe economic disadvantage with real implications for household income and job security.

This economic disadvantage is most evident among dial-up households, who are disproportionately located in non-metropolitan areas.<sup>9</sup> While the sample size of “dial-up” households is very small at 73, it is useful to examine the impact of moving from dial-up to broadband in terms of household productivity.

As seen in Table 26, a large portion of households with dial-up connections indicate that they plan to move to broadband with the intention of adopting new productivity applications. This appears to validate the already widely held belief that adoption of broadband should bring tangible benefits to households and their communities.

<sup>9</sup> In this survey, households in communities with a population less than 50,000 were three times as likely to be on dial-up compared to those in communities larger than 50,000. Households in isolated small towns were almost four times as likely to be on dial-up – Broadband Illinois eSolutions Benchmarking Report (page 39).

**TABLE 26: Difference in Use between Households with Dial-up and Broadband Connectivity**



The preceding analysis highlights the benefits that broadband can bring individual households. These benefits extend to the community level as well, as household impacts accumulate. The impact of household access and use of broadband is most critical for rural and non-metropolitan communities. Not only are rural communities more likely to have no broadband or low quality broadband, but these communities are often suffering from economic dislocation and population loss<sup>10</sup>. Lack of broadband makes communities less attractive and accelerates population loss.<sup>11</sup>

### 3.5 How People Prefer to Learn

In the previous section, the issue of gaps in utilization by household and regional characteristics was explored. Closely related is the issue of how households acquire the skills required to overcome those gaps, especially their lack of technical skills and discomfort with technology.

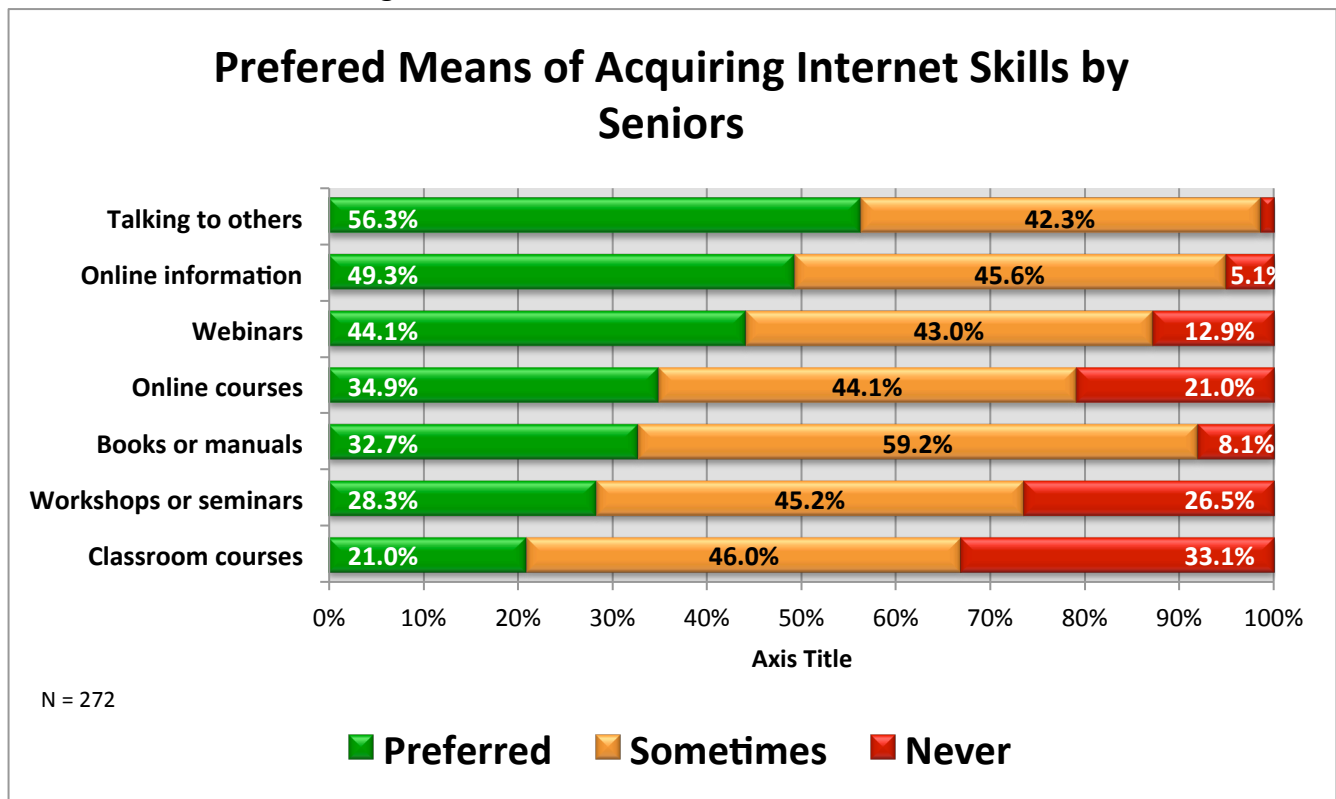
<sup>10</sup> See various publications of David McGranahan from the USDA: <http://www.ers.usda.gov/ers-staff-directory/david-mcgranahan.aspx>.

<sup>11</sup> To provide a perspective on the overall importance of broadband, households were asked: “Assuming you could never get broadband service, how likely is it that you would leave to relocate to a community that offers broadband?” At least 18 percent of households would definitely relocate to another community in order to access to broadband services. An additional 20 percent would consider relocation very likely.

So what are the preferred means for people to acquire the skills and knowledge needed to overcome gaps in utilization? **What is evident across all groups is the strong preference for informal means of acquiring information, either through talking to others and self-directed online information.** Formal courses and face-to-face classes are by far the least preferred means of learning for all groups. The following chart uses the example of seniors to illustrate this point.

Addressing expertise and knowledge related to eSolutions can mitigate other barriers, especially privacy concerns.

**TABLE 27: Preferred Learning Methods for Seniors**



*Recommendation #8: In designing initiatives to increase and improve Internet utilization by households and organizations, considerable weight should be given to those learning methods that are preferred by the target populations.*

Rather than trying to entice target populations into existing programs (such as classroom courses), e-resolution adoption initiatives should reflect the preference for both self-directed online resources, as well as existing informal networks that already have participation by these target groups. These can include seniors' centers, libraries, churches and community centers.



## 4. Summary and Next Steps

This report analyzes how organizations and households in Illinois utilize broadband. It considers different industry sectors and household types and regional differences within those groupings. It also considers what kinds of actions will improve their performance and how they could benefit further from broadband.

The consistent finding is that broadband access, adoption, and utilization has major beneficial impacts on communities, businesses<sup>12</sup>, community anchor institutions (CAIs) and households. Nonetheless, many businesses, CAIs and households do not avail themselves of much of the potential that the Internet offers. Low levels of Internet utilization have predictable patterns, which allows governments and concerned stakeholders to craft initiatives that increase Internet utilization and drive benefits from broadband.

This report identifies strategies and recommendations to address opportunities and gaps in broadband utilization. Implementation of these recommendations is the logical next step. Each government entity and stakeholder will find specific strategies and recommendations that address their priorities. This report recommends the following process for operationalizing the strategies and recommendations contained in this report.

- a) Assessment of the current level of Internet utilization in individual communities, businesses and CAIs. Comparing one's community, CAI or business against state and regional benchmarks provides valuable information in setting goals and objectives. The assessment process identifies actual utilization patterns (including strategic opportunities and gaps) and is the foundation for planning change.
- b) Building on their assessment, identification of priorities and action plans at the community, sectoral or individual business level.
- c) Individual communities, businesses, and CAIs should develop investment plans based on estimated return or benefits resulting from increased broadband access, adoption and utilization.

The objective of benchmarking utilization of the Internet is to provide "actionable intelligence" to governments, stakeholders, and individuals. Taking action on the recommendations included in this report will enable Illinois to move towards the realization of further benefits from broadband.

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<sup>12</sup> Data collected from 2,453 establishments by SNG's 2012 eSolutions Benchmarking for Partnership for a Connected Illinois showed that while 10,200 new positions were created, reporting organizations also experienced sizeable job reductions in the preceding 12 months, resulting in a net job increase of 5,043 positions. The net job increase attributed to using the Internet was 2,027 positions. The Internet facilitated the creation of 22.3 percent of all new jobs created and constituted 40.2 percent of net jobs created. See Section 2.5 of the *Broadband Illinois eSolutions Benchmarking Report* for more detailed analysis.

## Appendix 1: Glossary

**eStrategy Report:** This report examines how organizations and households in Illinois differ in their utilization of broadband and where they can look to make improvements. The report shows in detail how different industry sectors and household types compare to each other, especially between and within regions. The report provides insights and hard evidence that allows regions, businesses, and households to assess where they stand. The report provides recommendations on strategies for improving their Internet performance and benefits.

**eSolutions Benchmarking Technical Report:** This report presents the results of survey-based research carried out for the State of Illinois. The surveys collected information from businesses, organizations and households on the availability of broadband (high speed Internet access) and its uses, benefits, drivers and barriers. This largely descriptive report results provide insight into gaps and opportunities for increasing broadband utilization by organizations and households. The policy, planning and program implications for Illinois and its regions are dealt with in a separate report: the *Broadband KY* eStrategy Report.

**Digital Economy Analysis Platform (DEAP):** The DEAP has been developed as an online resource that provides clients with access to the data collection results and the ability to customize their analysis across a range of variables, including industry sector or geographic region. The DEAP is accessed online by authorized users. Users are presented with **dashboards** for businesses and for households. Each dashboard is organized around a series of **pages** focused on specific topics, e.g. Connectivity, Utilization, DEi, Impacts, etc. Within each page is a set of predefined **reports** that present a chart and/or table of processed results from the datasets.

**eStrategies:** eStrategies are high level plans for achieving one or more goals related to improved access to and utilization of broadband Internet. eStrategies define a course of action that is most likely to successfully address opportunities, challenges or barriers related. Strategies are usually seen as distinct from detailed action plans which deal with specific issues of “who, what, when and how”.

**eSolutions:** refers to the integration of Internet technologies with the internal computer-based systems and applications within or among organizations for a variety of operational processes. eSolutions encompass not only product delivery and payment transactions (e-commerce) but also all processes that may be facilitated by computer-mediated communications over the Internet.

**e-Process:** uses of the Internet which include internal operational uses, such as supplier coordination, training and teleworking.

**e-Commerce:** uses of the Internet which include activities related to the sales, marketing and delivery of products and services; and,

**Illinois Digital Economy Index (DEi):** The Digital Economy index (DEi) is part of the benchmarking process and provides reference points against which the performance of any individual or group can be compared. The DEi summarizes an organization’s or household’s utilization of a range of Internet applications and process – 17 for organizations and 30 for households. Based on the number of applications currently being used by an organization or household, a composite score is calculated that summarizes how comprehensively each organization or household uses Internet-enabled eSolutions. The DEi can be used to compare organizations, regions, or industry sectors.

**Utilization** refers to the third stage in the broadband development process. The first stage is providing a community, household or organization with access (availability) to the Internet. The second stage is adoption or the process whereby a person or organization starts to actually use the Internet. The third stage is utilization whereby a person or organization uses their Internet connection to create value. Many people and organizations have access and have adopted the Internet, but are relatively ineffective in how they use and derive benefits from the Internet. The field of analysis labeled “utilization” explores patterns of Internet use and how these patterns can be enhanced.



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