

BEST PRACTICES RESOURCE GUIDE

This section provides an overview of how various sectors use technology, focusing on specific applications. The examples provided below can be used to help develop the projects outlined in Section D of the Strategic Technology Plan (Tab 1).

The applications are intended for the typical technology user in each sector. Of course, not every technology is feasible for every community.

Business

This overview describes the current state of the art in small business applications and assesses the quality of services provided by various vendors. The business sector is highly evolved compared to other sectors, with an enormous range of potential applications. This document identifies trends that seem most pertinent to rural regions with small, entrepreneurial businesses.

Basic Information Deployment

In rural areas, the primary challenge is helping businesses to draw “eyeballs” to their websites. To be effective, websites should provide as much key information and data as possible. Following are examples of the sort of information that should be included:

- Hours of operation and location(s)
- Contact information
- Subscriptions to e-mail updates
- Intuitive search engine
- Access to information regarding products and services
- Ordering information (see e-commerce below)
- News, updates, special offers, coupons and other events

e-Commerce

Payment portals connect local entrepreneurs and small businesses to broader markets. There are a variety of models and vendors that are becoming increasingly cost-effective and common, even among smaller businesses. There are risks and costs, but accepting payments online is commonly seen as an essential cost of business in the internet age.

Using established, trusted vendors is essential to minimize the potential risks of accepting online payments. Many vendors can assist with establishing payment portals. Additionally, many hosts and ISPs make it easy for customers to get up and rolling.

Increasingly, entrepreneurs have been flocking to eBay, Yahoo and other online outlets for sales. These have the advantage of handling all customer transactions, for per-transaction charge. In our research, we found that many local chambers and other economic development organizations provide eBay 101 or web retailing 101 courses for local businesses. This sort of informational

and educational service may be as important as anything for fostering e-commerce. Several ConnectKentucky partners currently offer e-commerce solutions (NetTango, Belcan, CSI, Inc.).

Customer Relationship Management (CRM)

Many larger businesses find that the web is their primary point of contact with customers, whether it is for placing orders, tracking shipments, or follow-up customer service. It is important for businesses to provide an interface through which the most common actions and information requests can be routed. There are many vendors who provide customer services. The following providers match reasonable prices with good reviews. (Prices vary, depending on whether the service is a monthly service or a user license):

- Commence (www.commence.com)
- Act! (www.act.com)
- Salesforce.com (www.salesforce.com)
- BMC (www.bmc.com)
- Entellium (www.entellium.com/)
- Terrasoft (<http://www.terrasoft-crm-software.com/>)
- Siebel (www.siebel.com/small-business-crm/software-solutions.shtm)

Content Management

Keeping website information up-to-date and accurate is essential. Content management systems make it relatively easy for even untrained small businesses to incorporate quick and easy updates to websites into their day-to-day routines.

Leading consultants and vendors include:

Enterprise (large-scale packages for use across an entire business):

- [Vignette](#)
- [Interwoven](#)

Mid-market:

- [ArsDigita Community System](#)
- [Atomz](#)
- [RedDot Solutions](#)
- [Microsoft Content Management Server](#)

Free or low-cost:

[Ektron](#)
[OpenCMS](#)
[Userland](#)

VOIP

Making phone calls over the internet – a technology called VoIP, or Voice over Internet Protocol – can save small businesses significant sums of money. In the last few months, the technology has improved markedly, with dramatic increases in quality of service and customer satisfaction. There are caveats, of course — some vendors have spotty service and the business model has yet to prove itself in the long run. That said, there are numerous resources for comparing potential packages and making a business choice. An excellent resource is the database of user reviews located at Broadband Reports (www.broadbandreports.com). Nortel, a ConnectKentucky partner, offers VOIP solutions.

Potential Models and Vendors

Creating community business portals and/or “site-in-a-box” models may make seemingly out-of-reach applications more of a reality for small communities.

- Community Portal Model
 - Heartland Communications:
 - Discover Paducah (www.discoverpaducah.com)
 - American Town Network (<http://www.americantowns.com/home.html>)
- Vendors
 - Heartland Communications (<http://www.hcis.net/iuuy>)
 - Project A (www.projecta.com)
 - Urban Insight (www.urbaninsight.com)
 - InnerCircleMedia (www.innercirclemedia.net)

Healthcare

This overview describes the current state of the art in potential technology applications in the healthcare sector and assesses the quality of services provided by various vendors. This overview focuses on technologies that can assist medical practitioners and improve diagnostic and therapeutic services.

There are several online resources for information about technology-based healthcare initiatives in Kentucky. For instance, the Kentucky Telehealth Initiative is at the forefront of exploring and implementing technologies that enhance patient care, diagnosis, therapy, continuing education and improving business practices. Also, the Kentucky TeleCare Network (www.mc.uky.edu/kytelecare/) performs telemedical consultations in partnership with St. Claire Medical Center (<http://www.st-claire.org/telecare/>).

These findings and recommendations have been developed with small medical practices in mind.

Diagnostic and Therapeutic Technologies

Diagnostic and therapeutic care technology is becoming increasingly sophisticated, even as the price drops. Targeted investments in “telehealth” are proving to be valuable to patients and practitioners in several areas. These include:

- Remote monitoring for patients with conditions such as heart disease, diabetes, and Chronic Obstructive Pulmonary Disease (COPD) among others
- Remote diagnostics (for example, distance visioning technology e.g., retinal imaging for diabetics or dermatological visioning)
- Pre-operative assessment from a distance
- Counseling, psychological, and psychiatric services (e.g., nutritional counseling and child psychology)
- Anesthesiology

A good resource on current best practices is provided at the Kentucky Telehealth Network (<http://www.kthnschedule.com/Services/services.php>).

In order to deliver on the promise of these technologies, the first step is for practitioners to make prudent investments by seeking advice from knowledgeable sources.

Information Dissemination

As is the case with businesses, healthcare professionals can provide better service to those under their care by providing information via the web. A first step toward meeting general needs of patients is to provide online access to as much information and data as is possible and prudent. Examples of the sort of information that should be included are:

- Provider's hours of operation and location(s)
- Contact information
- Information on nutrition, health and illnesses
- Access to information regarding services, affiliations, medical staff
- Ordering information (if appropriate)
- Scheduling and appointments
- Insurance and claims
- News and events

The Kentucky Delta Access Project (www.kydap.net) is a noteworthy example. This project—administered by the Trover Foundation in Madisonville—has worked with individual counties to address local health issues and develop local resources through planning activities and [health improvement projects](#).

Decision Support (Best Practices)

Studies show that healthcare providers should use support systems when making clinical decisions. Technology makes this easier than ever. These support systems range from a simple, paper-based scoring system to computerized reminders that increase the use of preventive and screening services, improve drug prescribing, assist with diagnosis, and help choose the best therapy.

Electronic Medical Records

Electronic medical records have numerous potential benefits. Ideally, an electronic record should allow family physicians to (1) track episodes of care, not just discrete events, (2) create family genograms, (3) quickly obtain information on members of a family, (4) integrate information about the community to allow a community-oriented approach, (5) gather data for practice-based research, and (6) integrate transparently with evidence-based, continuously updated, decision support systems.

Ulrich Medical Concepts (www.ulrichmedicalconcepts.com), a Paducah company, is a provider of solution for medical information management.

Vendor recommendations from the user-satisfaction survey conducted by the American Academy of Family Physicians can be found at www.aafp.org/fpm/20051000/29aneh.html

Morgan Haugh Medical Group (www.morganhaugh.com), of Mayfield, is one of several large groups of physicians gearing up to offer smaller medical practices access to the electronic medical record software they use. This approach promises to make it easier to share patient information with other physicians. Morgan Haugh has begun discussions with other doctors in Kentucky about providing them with hosted access to its ambulatory care EMR system from San Francisco-based McKesson Corp.

Company, Web address and telephone	Estimated size of current user base*
Alteer Office http://www.alteer.com 949-789-0500	350 family physicians in 250 practices; 70 percent of users are solo physicians; the main company focus is now California
Amazing Charts http://www.amazingcharts.com 866-903-0821	> 725 practices, perhaps one third of which are family medicine practices
Centricity (Logician) http://www.gehealthcare.com/user/img_info_systems/centricity_clin_info/products/emr.html 800-558-5120	> 10,000 physicians, of which more than 30 percent are family physicians
EClinicalWorks http://www.eclinicalworks.com 866-888-MY-CW	3,600 practices, of which 120-130 are family medicine practices

e-MDs (TopsChart) http://www.e-mds.com 888-344-9836	730 family medicine practices
EpicCare http://www.epiccare.com 608-271-9000	80 clients representing 2,400 sites and > 66,000 physicians; 51 of the clients (1,790 sites, > 47,200 physicians) fully operational
HealthMatics EMR http://www.a4healthsystems.com 888-672-3282	250 family medicine clients representing nearly 400 sites
Misys EMR http://www.misyshealthcare.com/Products/product+portfolio/misys+emr/index.htm 866-MISYS-US	18,000 practices with 92,000 physicians; family medicine the largest specialty segment
NextGen EMR http://www.nextgen.com/pro_emr.asp 215-657-7010	Approximately 200 family medicine practices
Practice Partner http://www.pmsi.com 800-770-7674	450 family medicine practices
SOAPware http://www.docs.com 800-455-SOAP	7,000-8,000 sites; 1,922 family-physician users, more than from any other specialty

Computerized Physician Order Entry (CPOE) – ePrescribing

More and more doctors and hospitals are making drug orders using computerized systems that include medication error-prevention software. Computerized Physician Order Entry (CPOE) programs can provide physicians with a menu of medications from the formulary, complete with default doses and a range of potential doses for each medication. They ensure that all drug orders are legible. The program can display patient-specific, relevant laboratory results on the screen at the time of ordering and check for drug-allergy contradictions and drug-drug interactions. CPOE systems are designed to reduce medication errors, which typically cause patients to stay in the hospital about three days longer and raise hospital costs between \$2,000 and \$5,000. CPOE systems

have been shown to reduce costs associated with adverse drug reactions when the system is used in conjunction with clinical decision support systems, such as prescribing cheaper but equally effective drugs, reducing unnecessary lab tests, and using evidence-based treatment guidelines. (For more information, see www.academyhealth.org/syntheses/cpoe.htm)

Claims Filing

Using electronic forms to file claims can save money.

Communications

There are a variety of ways that technology can enable better communication among far-flung healthcare providers. As was suggested above, technology can make it easier for providers to access state-of-the-art information and improve decision-making. Beyond that, several communications technologies are recommended for consideration:

- Video conferencing
- VOIP

Continuing Education

Whether it's a provider working on continuing educational units for licensing purposes or an office manager delving into the intricacies of coding to improve reimbursement, distance learning through the web is a tremendous way to take advantage of great course offerings while minimizing time away from the office.

Potential Vendors

American Medical Association

<http://www.ama-assn.org/ama/pub/category/2797.html>

Medical Group Management Association <http://www.mgma.com/education/>

American Cancer Society - The American Cancer Society is offering free CME credit for learning information and recommendations on colorectal cancer prevention and early detection. This CME activity includes presentations that address risk factors, prevention strategies, recommended screening options and the current status of virtual colonoscopy and molecular stool screening. Go to <http://www.cancer.org/colonmd/> for more information.

Community-Based Organizations

Basic Information Deployment

For community-based organizations, the primary challenge in building a website is explaining the mission and activities of the organization to as broad an audience as possible. A first step toward meeting general needs of clients and customers is to provide online access to as much information and data as possible. The sort of information that should be included is:

- Mission, goals and activities
- Hours of operation and location(s)
- Contact information
- Donations and volunteering opportunities
- Access to information regarding activities, successes and needs
- News and events

Interactive Forms/Applications

Beyond basic deployment of information, many community organizations can use web-based tools to gather information from those they serve. For example, many organizations that receive local and state funds to provide services must track applicants, grants and the like. Community-based organizations can use web-based forms to communicate more efficiently and provide better service to their clients.

Customer Relationship Management (tracking donations, communications)

Community-based organizations benefit greatly from web-based applications that connect them with the public. For many organizations, the web is a primary point of contact with donors, volunteers and others interested in their mission and activities. CRM programs can be used to communicate with these parties, to track donations, and to respond to information and action requests. Providing an interface through which most common action and information requests can be routed is a proven success with businesses of all sizes; these lessons can be replicated by community organizations.

Information on Resources

For most organizations, gaining access to information that will enable them to participate in all that technology has to offer is a big challenge. Resources that are available via the web are only of use if the organization has the access and savvy to use those tools. For example, fundraising is a central activity for virtually all community-based organizations. These groups can benefit from fundraising ideas and assistance provided on the web, such as eBay's Mission Fish (<http://www.missionfish.org/>).

Registrations & Reservations

Many community-based organizations provide of classes, facilities and other public services. E-commerce applications that are specifically tailored to the needs of such providers are increasingly common and cost effective. For example, potential visitors can book a reservation for a facility online, including making payment.

VOIP

Like government and businesses, community-based organizations can take advantage of the tremendous potential cost savings of Voice over the Internet Protocol, or VoIP. See the Business Sector for more information on VoIP.

Government

This overview describes the current state of the art in web-based government applications and then assesses the quality of packages provided by various vendors.

Government Web Presence

The first step in the process of providing e-government services to constituents is developing a functional web portal. A portal can enable site consultants to do research for new business locations via the web, provide citizens easy access to information regarding government services, and increase efficiency of internal processes. Approximately 50% of local government entities have a web presence. A partnership is being formed with public and private entities to offer local governments an affordable way to build a web presence.

Basic Information Deployment

Often overlooked in e-government deployment are the issues of audiences and needs. Local governments must determine who will visit the website and what sort of information and services they will typically seek. A first step toward meeting general needs of constituents is to provide online access to as broad a swath of governmental information and data as is possible. The sort of information that should be included is:

- Hours of operation and location of facilities
- Contact information of key staff and departments
- Intuitive search engine
- Access to documents (ideally a centralized repository of online documents and forms)
- Local ordinances, codes, policies and regulations
- Minutes of official meetings and hearings
- News and events

According to a recent ConnectKentucky study, leaders in e-government services in Kentucky are:

Cities:

Louisville/Jefferson County
Lexington/Fayette County
Newport
Pikeville
Bellevue

<http://www.loukymetro.org>

<http://www.lfucg.com>

<http://www.cityofnewportky.org/>

<http://www.cityofpikeville.com>

<http://www.bellevueky.org>

Counties:

Daviess

<http://www.daviessky.org>

Boone

<http://www.boonecountyky.org/>

Jessamine

<http://www.jessamineco.com/>

Campbell

<http://www.campbellcountyky.org/>

Hardin

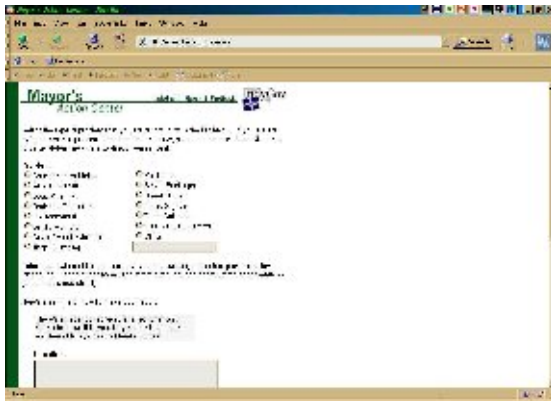
<http://www.hcky.org>

Content Management

Many larger jurisdictions are developing sophisticated means of keeping information up-to-date and accurate, making the website the point of contact and the authoritative reference for government staff and constituents alike. Various content management systems make it relatively easy for government staffs to incorporate these updates into their day-to-day routines. See the Business Sector section for a list of leading consultants and vendors.

Constituent Relationship Management (CRM)

Many local governments are using web-driven applications to connect constituents with the appropriate service provider within government. Government agencies have achieved success by providing a one-stop shopping site where constituents can access the most common services and have their most frequent questions answered.



The example on the left is from Indy.gov and was developed by NIC, which is one of the vendors listed below.

Geographic Information Systems (GIS)

Perhaps the application with the most potential for government agencies, Geographic Information Systems offers manifold opportunities to improve efficiency, disseminate information to the public, and improve the quality of governmental service. The number of local governments providing web-based mapping applications is growing by the day. GIS is no longer a prohibitively expensive application and can be a cornerstone of e-government services. For example, the City of San Diego (click Figure 1) has connected its GIS with its

website, enabling people to locate a point on the map and make an action request (such as a pothole complaint) via the mapping feature.

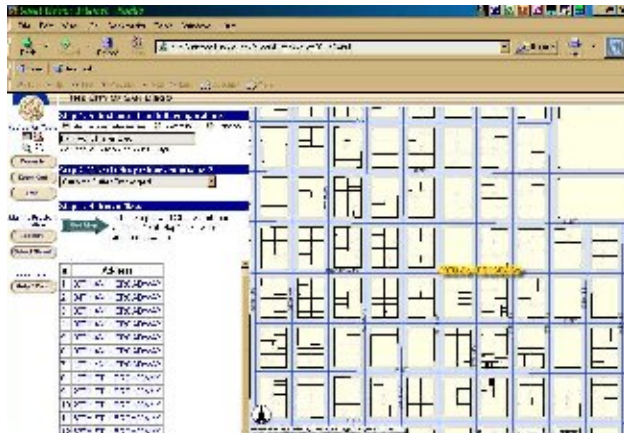


Figure 1: City of San Diego Street Division

e-Commerce

Online payment for government services has tended to be rarely used, but the practice is becoming increasingly cost-effective and common among smaller units of government. Allowing citizens to pay licensing fees, citations, taxes, and utilities online can be a cost-reducer for governments, whether it is done through a web-based payment portal or through an automatic draft. There are risks, but accepting payments is a common function of governments. Established, trusted vendors are essential to minimize the potential risks of accepting online payments.

Government agencies can also use e-commerce for transactions with other government agencies and with the private sector. For example, web-enabled procurement and asset management tools can provide significant cost savings.

Some noteworthy examples are:

- Bid AMT is a Kentucky company that has been in business since 1999. It was formed in partnership with municipalities in numerous states to offer on-line procurement to save taxpayer dollars on purchases. This company now operates on two platforms for asset management: electronic sealed bid and e-procurement.
<http://www.bidamt.com/default.aspx>
- El Paso's utility services payment portal: <http://www.epwu.org/>
- New Orleans' payment portal for permitting: <https://online.new-orleans.la.us/servlet/user/ViewPermit?permitId=1>

- Los Angeles' procurement page: http://www.biddingnet.com/ladwp/bid/rfp_pub_open.asp
- Long Beach recreation registration portal: <http://www.ci.long-beach.ca.us/park/index.htm>

Recommended Vendors

NIC

NIC has a proven track record of successful partnerships (including with Kentucky.gov). They are a logical choice to assist in local government service provision in Kentucky. Their lengthy resume of local government solutions covers all of the topics listed above and many more (For a complete list, see www.nicusa.com/html/nic/solutions/index.html).

GovOffice.com

GovOffice (<http://www.govoffice.com/>) is the product of collaboration among the International City County Management Association (ICMA), various state municipal leagues and Microsoft. Their basic package for local government is a solid entry-level site that provides excellent provision of documents and information. This "website in a box" package stresses the deployment of documents and information over high-end applications such as GIS. That said, the ICMA has partnerships that seem to make GIS functionality an option. GovOffice also provides customer relations, content management and e-commerce functions through their technology partners and affiliates.

CGI-AMS

American Management Systems, recently acquired by CGI, is a long-standing expert in providing technology solutions, particularly of financial systems, to local governments. Their resume also includes:

- [Document and records management](#)
- [Enterprise architecture and government transformation](#)
- [Enterprise resource planning](#)
- [Environmental and regulatory management](#)
- [Human services and labor](#)
- [Tax, revenue, and collections](#)

ezGov Inc

EzGov (www.ezgov.com/affinity_us_state_local.jsp) is a leader in financial solutions that has recently expanded its into customer relationship management. As with AMS, ezgov's strengths are licensing and e-commerce (especially revenue collection).

Electronic Data Systems Corp.

EDS (www.eds.com/industries/government/) offers services akin to those provided by CGI and ezGov. Their clients are typically state and national governments, but they also have been developed a portfolio of local and county governments. A basic overview of their local e-gov services is available at (www.eds.com/industries/government/downloads/state_local_overview.pdf).

Tyler Technologies

Tyler Technologies (<http://www.tylerworks.com/>) is a leading provider of integrated, end-to-end information management solutions and services to local governments. Headquartered in Dallas, Texas, the company provides software and professional IT services to more than 6,000 local government offices throughout all 50 states, Canada, Puerto Rico and the United Kingdom.

Tourism, Recreation & Parks

Basic Information Deployment

Providing online public access to tourism information and services is essential. For organizations in the tourism and recreation fields, the primary challenge is drawing interest to local attractions. A first step toward meeting general needs of clients and customers is to provide online access to as much information and data as possible. A public information resource that could serve as a model is provided by the City of Owensboro Department of Parks and Recreation (www.owensboroparks.org).

Whether the information is provided by a “regional portal” or by individual organizations involved in this sector, the sort of information that should be included is:

- Hours of operation and location(s)
- Contact information
- Intuitive search engine
- Access to information regarding attractions, seasonal information, products, services providers, transportation and directions
- Reservations, registrations
- News and events

Lessons learned from other sectors suggest that the tourism industry can benefit from investing in software to manage customer relations and update websites (see the Business Sector, above).

Centralized Tourism Portals

Many communities have successfully marketed themselves by creating regional portals that provides a web presence for local merchants and hospitality, tourism and recreation service providers. A portal can provide web space for a specific provider to showcase its services, while giving a web presence and identity to a

region as a whole. There are numerous advantages to this sort of pooled resource, including the cumulative advantage of shared marketing and strategic planning.

A basic model that categorizes information by topic and region can be found at Kentucky.gov (kentucky.gov/Portal/Category/RECREATION).

Several other examples of tourism portals are:

Louisville Visitors Bureau: www.gotolouisville.com

Bowling Green: www.visitbgky.com

Owensboro/Daviess County Tourist Commission: www.visitowensboro.com

Marshall County Tourist Commission: www.kentuckylake.org

Audubon Region—Green River Tourism Committee: www.bbbregion.com

e-Commerce

Payment portals are an essential way of connecting local entrepreneurs and small businesses to potential tourists interested in local attractions. Online sales are becoming increasingly cost-effective and common, even for smaller businesses. There are risks and costs, but accepting payments is commonly seen as an essential cost of business.

In the following section, we outline forms of e-commerce particular to this sector.

Registration, Reservations, Scheduling & Tickets

For many tourism service providers, offering web-based access to interactive applications is an essential aspect of business. E-commerce applications that are specifically tailored to the needs of such providers are becoming more common and cost effective. For example, a program that enables visitors to book and pay for a canoe trip online allows tourists to plan their vacations in advance and increase the quality of their visits.

Mapping and Visualization

Local attractions and service providers can take advantage of the enormous strides in mapping and visualization that web-enabled applications can provide.

The potential uses are numerous:

- Downloadable as-built maps (e.g., maps of resources, attractions, facilities, trails, roads, and bodies of water)

- Recreation and resource guides

- Virtual tours

A noteworthy example is the U.S. Department of Agriculture's Land Between the Lakes Maps page (www.lbl.org/VCMaps.html). This resource links to a repository of as-built images that can serve as a model. The Kentucky Artisan Heritage Trails (www.kaht.com/) also has well-developed geographic resources.

WiFi Hotspots (parks, welcome centers, kiosks, hotels, etc.)

Given the emphasis of the Governor's Prescription for Innovation, providing high-speed internet access to Kentucky residents and visitors is increasingly important. WiFi hotspots will draw a growing number of potential visitors, whether the access is provided at official sites, information centers, kiosks, parks, welcome centers or hotels.

For example, Green Turtle Bay, a Livingston County resort serving the Land Between the Lakes region, provides wireless high-speed internet access that allows boaters to access the web from their cabins.

VOIP

Individuals and organizations, like businesses of all types, can take advantage of the tremendous potential cost savings of Voice over the Internet Protocol. See the Business Section, above, for more information.

Agriculture

Information Dissemination

As is the case with other businesses, agricultural producers may find benefits in providing their customers access to information, products and services via the web. A first step toward meeting general needs of clients and customers is to provide online access to as much information and data as possible. The sort of information that should be included is:

- Location(s), type of producer, size of operation
- Contact information
- Livestock and equine breeding and health records
- Access to information regarding products and services
- Ordering information
- News and events

In addition, agricultural producers can benefit from the vast array of information, data and services provided online. For example, the Kentucky Equine Education Project (KEEP-- www.equinealliance.com/), is a network with a strong online presence that has as its mission the development a state grassroots network involving Kentucky's 128,000 horse economy participants in all 120 counties. KEEP uses the web to build a state coalition of diverse organizations supporting Kentucky's horse economy.

Agricultural producers also can benefit from the best practices and safety information provided by various state and federal agencies (such as chemical guidelines, recertification and tracking from the USDA and other agencies). Extension services also offer an increasing number of essential resources for producers. For example, Kentucky.gov provides an excellent overview of state agricultural programs and online applications (http://kentucky.gov/Portal/Category/res_env-mgmt). Similarly, the Kentucky

Department of Agriculture provides access to a range of governmental and private sector agricultural organizations (<http://www.kyagr.com/aginfo/links/aglinks.htm>).

The USDA Farm Service Agency is quickly placing all of its forms online and plans to accept online submissions exclusively in the future.

Agricultural Technologies

Some farmers use satellite-based global positioning systems (GPS) to create database-driven harvest records that influence planting machinery. This technology, which is primarily used by large farms, can have significant impacts on cost savings and efficiency gains.

Sygen is a prime example of Kentucky's role in the future of biotechnology and applied research (www.sygeninternational.com). Sygen uses genetic selection to enhance meat quality and improve efficiency in livestock production.

Farming technologies that require high-speed internet access are increasingly common. Some examples:

Precision farming technologies: Includes collection and mapping of spatial data on crop yields and soil properties. AgConnections (www.agconnections.com), a Murray-based company, is an agricultural consulting and software development company that provides this service. For more information about precision farming, see www.esri.com/industries/agriculture/agriculture.html.

Position communications: These technologies relay position and movement information. For example, a harvester operator and the receiving truck driver can use a light display to position the truck so it doesn't become overloaded when visibility is low at night or during dusty conditions.

Irrigation systems optimization: Irrigation systems using end guns or corner systems (swing booms) have considerable variations in chemical application rates. In recent years, methods have been developed to cost-effectively and conveniently control the rate of chemical injection.

Water quality monitoring, modeling or management: New technology promises to remove the hassles of tending manually operated water-sampling instruments. Emerging passive water samplers are powered by the water itself and automatically sample at the correct rate.

Geographic Information Systems (GIS)

GIS is used in a variety of agricultural applications, such as managing crop yields, monitoring crop rotation techniques, and projecting soil loss for individual farms or entire agricultural regions.

Some sites providing GIS applications in agriculture are listed below. AgriSupportOnline is an international agricultural consultancy group that delivers consultancy via the Internet. <http://www.agrisupportonline.com>

U.S. Department of Agriculture - Cooperative State Research, Education and Extension Service proposed for the implementation of global Agriculture Database Decision Support (ADDS). ADDS databases are valuable resources for producers, educators, consultants, service providers, the media and others.
www.reeusda.gov/agsys/adds/ashspapr.htm

Here, one can find how GIS can be used to obtain information on crops and soils and make decisions on where to apply chemicals or pesticides.
www.arcdataonline.com/industries/agriculture/ag_production.html

Digital Livestock ID

Using advances in radio-frequency identification (RFID), various technologies provide livestock producers with rapid and accurate identification, location tracking and condition monitoring of livestock such as horses and cattle. Such systems will provide "field-to-fork" supply-chain monitoring and information on agriculture.

The Agriculture Department, livestock producers and processors have developed a program called the [U.S. Animal Identification Plan](#) that will use radio frequency identification tags to track livestock from birth to slaughterhouse. Information about the 200 million head of livestock in the U.S. will be stored in a national database.

Vendors:

ScoringAg.com

PowerID Division of Power Paper Ltd

Balance Bourbeau

Digital Extension: (eXtension—application)

An emerging application that will be increasingly used by agricultural producers is the national eXtension system (<http://intranet.extension.org/>), developed by the Cooperative Extension Services of the U.S. states and territories, along with other components of Land-Grant Universities and the Cooperative States Research, Education and Extension Service of USDA. This collaborative effort will allow the Extension system to more efficiently serve current and new customers in ways that provide accurate and timely information. The system complements the Extension educators located in more than 3,000 counties of the U.S.

A sample of the offerings of the service:

- News articles and links
- Aggregated best information focused on a particular user's situation
- Content organized in databases separate from the delivery platform so that it can be adapted for multiple electronic delivery modes (cell phone, fax, PDA, desktops, and future digital technology)
- Discussion forums

e-Commerce

Like many other businesses, agricultural producers may benefit from purchasing and selling online. Online payment mechanisms are becoming increasingly common and inexpensive, thanks to a variety of vendors and models.