

State of Wisconsin
Department of Agriculture, Trade, & Consumer Protection
Madison, WI

Network technology for freshwater, environmental, and natural resource issues

WDATCP Integrated Information System

Project Purpose:

The Wisconsin Department of Agriculture, Trade and Consumer Protection (WDATCP) interacts with a wide range of entities to accomplish its' mission:

“To assure the safety and quality of food, fair business practices for the buyer and seller, healthy animal and plants, efficient use of agricultural resources in a quality environment, and to promote the interests of agriculture.”

For more than 150 years, agriculture has driven the state's economy. It remains the number one industry in Wisconsin, generating \$40 billion in economic activity and creating over 200,000 jobs -- one of every five people in the state.

The importance of agriculture to Wisconsin's economy alone underlines the crucial need for WDATCP to develop a comprehensive source of information relating to Wisconsin's agricultural community.

Agricultural disasters, such as the spread of highly contagious animal diseases (Appendix A & B) would gravely affect Wisconsin's economy. In 2001 nearly 4,000,000 cows, sheep and swine were slaughtered in the United Kingdom due to an outbreak of Foot and Mouth Disease (FMD). Foot and Mouth is a highly contagious virus that affects animals with cloven hoofs. FMD is endemic in parts of Asia, Africa, the Middle East and South America. If spread in Wisconsin, whether accidentally or intentionally, it could cripple our economy, and limit travel and tourism in effected areas.

The most common way to stop the spread of this disease is to cull (slaughter) all animals on the effected farm and all neighboring farms. When foot-and-mouth disease erupted in the United Kingdom in February, our animal health professionals moved into high gear, alerting farmers and urban citizens alike to take essential steps to prevent a crisis here. Bio-security suddenly became a household word in Wisconsin, where an estimated 70 percent of the \$40 billion generated by agriculture depends on livestock.

However, currently WDATCP does not have the capacity or ability to capture data on the number and type of livestock or their locations. A comprehensive data repository would allow for the collection and storage of livestock information along with their geological location. This information could be collected from many sources, such as our food and dairy inspectors, Animal Health veterinarians and county agents.

The availability of accurate, accessible data is vital to react in a timely manner to potential catastrophes arising from natural disasters, environmental accidents or acts of terrorism. Of course, no one could have foreseen the dramatic events that have shaped our state, nation, and world in 2001, thrusting this Department into a key role in our homeland's defense. The things we do on a daily basis are now in the headlines. We are now asked to be on high alert, doing the things we do every day.

Here are some of the ways WDATCP was on guard in 2001:

- We monitored the harvest of close to half a million animals and performed 40,000 meat plant inspections and another 40,000 food establishment inspections.
- Our laboratory tested tens of thousands of food samples ranging from milk and cheese to deli salads to bottled water; performed 100 tests a week just looking for Salmonella in ground beef; and tested every product in every grade A dairy eight times during the year.
- We certified close to 1,300 businesses and 33,000 individuals for pesticide use.
- We surveyed 948 fields and 32 crops, including grains, fruits and vegetables, for pest insects and diseases.
- In addition, WDATCP is responsible for monitoring unfair business practices ranging from price gouging at the gas pump to charity scams. We tested 8,756 checkout scanners and corrected them on the spot.
- We treated nearly 117,000 acres to halt the spread of gypsy moths -- the state's largest effort to date -- and contacted nearly 200 campgrounds to teach people not to unwittingly give the pests a free ride home.
- We trained people in 290 school districts - affecting approximately 735,000 students - in how to reduce the amount of pesticides and other chemicals used around children.

To perform these vital tasks, WDATCP collects a wide variety of data through its numerous programs. The general goal of this project is to integrate the Department's information systems with data kept in a multitude of sites, in both manual and electronic media, to a cohesive Integrated Information System (IIS). The base component of this system would be the creation of a Department wide Customer Management system.

Clearly, the changes caused by Sept. 11 are driving data integration and standardization. For example, the Department has jurisdiction over state establishments that produce and store fertilizers and pesticides. WDATCP also licenses pesticide applicators. However, this information currently resides in separate, diversified systems that offer only limited access. An integrated system would link this information and facilitate the Department in tracking these products and those who use them. This type of information would not only improve our enforcement capabilities but also allow us to increase our surveillance efforts in a way that would increase the potential for early detection of impending problems.

Moreover, data integration would better support our core functions, i.e., assessment, policy development, and decision making, through a more comprehensive approach to data and information resources. An integrated system would benefit many, if not all, programs in the Department.

Our IIS plan would make it possible to share information electronically internally and to reduce the number of information systems that perform similar functions. The plan provides the technological initiatives to guide strategic resource decisions that reduce costs and improve mission performance.

Completion of this project would foster communication among the various division programs and encourage better use of Department data. In turn, the Department would attempt to achieve

the objectives of greater sharing of data with other agencies, such as, other state Departments, county Extension programs, USDA, CDC, FEMA, and FSA.

New capabilities of information technology allow greater opportunities for integration of information systems for optimize response to critical situations. The Department's goal, as laid out by the organization's strategic plan, calls for improvements in application of information technology. The development of an IIS creates an effective foundation to achieve these initiatives by:

- improvements in prevention effectiveness,
- improvements in response to an agricultural emergency,
- improved service to customers,
- timeliness of processes,
- quality of information,
- optimum interoperability,
- reduction of unnecessary redundancy,
- support of secure information systems and
- responsiveness to requests for information.

It would also result in a more timely response to:

- legislative requirements,
- legal liabilities,
- regulatory requirements,
- quality imperatives,
- customer demands.

An integrated customer-based system would focus on the Customer/Premise ID as the integrating factor. Designating all entities, with which the Department interacts, with a common identifier such as, Customer/Premise ID, standardizes and synchronizes the data throughout the enterprise. Data can then be stored and extracted into compatible formats for reporting, query, and interchange. Users can go to one source for data access with a common query and analysis toolset. Web-enabled applications can be more easily built to use a common interface and can be made consistent across all platforms. This approach would provide reduced user interface complexities and training time.

This project also employs an integrated licensing system to make that information more accessible. Integrated information allows for the electronic exchange of data between computerized tracking, licensing & registration systems. It provides a seamless and secure exchange of information across all Department program areas and improves the efficiency of service coordination. This would make it possible to obtain a list of all license and certification a person holds in one query. Currently, this would involve contacting every Department division separately.

Building the new Department IIS that is compliant with national data standards provides a degree of standardization for data import/export to other agencies and promotes use of common utility programs.

Innovation:

This project, by the use of a focal Customer/Premise ID key, would make it easier to share information internally and reduce the number of information systems that perform similar functions.

This is innovative in a number of ways. First, it would be the product of a Department-wide effort, which would bring together animal health, food safety and consumer protection interests. The support and participation of this working collaboration is key to the development of a single integrated system to effectively meet the diverse needs of these different stakeholder groups and one that is acceptable and useful to them.

Second, this integrated system would also use national standardized data formats whenever possible. This would increase the degree of interoperability and connectivity across the Department and between the Department and other organizations. This helps to ensure effectiveness, efficiency, as well as longevity of the investment. Industry and public organizations are recognizing the need to move towards national data standards. Such standards form the basis to enable major cost savings, improved operating efficiencies, promoting timeliness in reporting, interoperability, simplifying data exchange, analysis, and quality control. Third, the proposal contains money for equipment that would allow our inspection force to collect geo-locator information from premises they are inspecting. Thereby enabling us to have Geographic Information Systems (GIS) functionality. GIS functionality would allow the Department to map and model the spread of disease or chemical spills and what farms and/or businesses they might effect.

IIS represents innovation through evolution. Instead of creating new parallel systems, IIS promotes the intermingling of data by relating information through a common identifier. Thus enhancing the value of existing data and encouraging the reuse of existing application code.

Diffusion Potential:

This project would facilitate planning and development of integrated agricultural information systems that would foster provisions for the transfer of information, technical assistance and advice to and from other state and federal agencies in a disaster situation. The projects' sponsor, the Wisconsin Department of Agriculture, Trade and Consumer Protection, recognizes the potential value of the proposed system as a model to improve service and eliminate system fragmentation.

While the focus of this project is Wisconsin, the needs addressed are common to states across the nation. In light of recent events and the growing possibility of terrorism, this system would provide a model that can serve as an easily adaptable template for replication at other state and federal agencies. The potential also exists to adapt the template and technologies and apply them to other populations and core systems within the agricultural and food service industry.

This common database provides a cost-effective tool for information and referral services, replacing less efficient existing tools (e.g. paper and stand-alone systems that are quickly outdated and costly to query). The system would address the states' need to track livestock, crops and food products and allow tracebacks to farms to assist in protecting food safety and control animal disease.

The online licensing and customer management system component will provide a cost-effective way to coordinate services aimed at improving supports for farms and food processors. To maximize diffusion of this technology, the project includes initiatives to enhance accessibility to Department information through a web-based connection.

The use of current network technologies and existing customizable commercial software applications make replication feasible. While there is a level of complexity to the project by virtue of the wide range of information involved, much could be learned and documented throughout the project's development process that would educate and guide future replication. The project would produce a number of benefits and products that would make its approach transferable to other states, including, a documented system architecture for agricultural processes and data modeling.

Multiple mediums will be employed to share results, including a project website; written reports; and presentations at local, regional, and national meetings and conferences.

Project Feasibility:

In the first year of the project WDATCP plans to acquire a third party software package to consolidate the issuance of all the licenses the Department handles (Appendix C). WDATCP issues approximately 120 different licenses, permits, and certificates to individuals and businesses throughout the State. About half of the licenses are issued in very small volumes (under 1000 annually).

Licenses and certificates are being produced from a variety of databases and applications. For many of the smaller volume licenses, Access applications have been developed. For the larger volume licenses, NOMAD (an outdated programming language) has been used, with a standalone relational database. The licenses and certificates are printed on a variety of forms and stock, with varying renewal cycles, fees and eligibility requirements. Independent systems have been developed to do compliance, inspection and complaint tracking.

The new system will run on our current technical architecture (with additional servers added to increase capacity) and have the base functionality required to meet all of the WDATCP division's mandatory licensing requirements. The system should integrate with our current lockbox arrangement and have the potential for web-based transactions.

As part of this project the resources would become available to also develop a comprehensive integrated information system by building an enterprise wide system of Department data using a Customer/Premise ID as the key. The Department has a variety of customers as illustrated by the variety of people and businesses we license. By creating a Customer/Premise ID as a unique key we build the base to address the added challenge of designing a uniform identification system for both livestock and crops.

A new system is needed because current livestock identification systems are piecemeal, applicable to only one breed or useful for only one purpose, such as recording vaccinations. A single animal may be assigned many numbers and none may be traceable. But there is generally no ID that follows an animal from birth to slaughter. We have many different systems, with dealers, veterinarians and breed associations, all assigning their own identifiers to the animals. Likewise, identification for crops is almost non-existent and it is nearly impossible to track plant products from their source to the marketplace.

Although all Wisconsin food plants must be licensed and inspected there is currently no standard system for tracing products back to the farm. Implementation of this identification system would allow tracebacks to farms to assist in protecting food safety, controlling animal disease, and reassuring trading partners. By having an identifier to tie to livestock and other farm products the system would allow, if necessary, focus on points in the food processing cycle that are most likely to introduce contaminants. IIS would also allow the Department to improve our surveillance techniques in a way that would increase our abilities to identify and track certain trends (i.e. illness in animals or humans). Early detection would allow for quicker and more appropriate respond.

WDATCP will supports the creation of an IIS with:

- inter-organizational leadership and senior management commitment at all levels,
- multi-year funding commitments,
- resource availability and consistency - financial and human,
- comprehensive data security plan,
- data confidentiality and sensitivity and
- adherence to international and national I/T standards.

To see an illustration of WDATCP's current network structure see Appendix D. Also included in Appendix E is an organizational chart for WDATCP's Bureau of Information Technology, which would be responsible for technical support of the system.

WDATCP also has a staff of 67 field inspectors in their Food Safety Division that would be responsible for collecting geo-locator and other Premise information while executing their regular inspection duties.

Community Involvement:

A common database would give the Department a much more effective way to gather information from our external customers about potential acts of terrorism. The industries we regulate provide a multitude of targets for a potential terrorist to disrupt not only the state food supply, but national food supply as the products are shipped across the country: dairy farmers, bulk milk haulers, dairy plant operators, meat plant operators, renderers, animal food processors, food warehouse, food processors, retail operators, and consumers; animals such as dairy cows, beef, hog, chicken, livestock haulers, livestock dealers, and others; aerial applicators, feed mills, fertilizer manufacturers or distributors, pesticide manufacturers or applicators, etc.

All of these are critical points for gathering information about terrorist or tampering risk via reporting by the wide variety of customers our Department touches everyday. The common database could be used to consolidate and integrate the input to assist us in spotting potential trouble spots or responding quickly, completely, and appropriately should a terrorist or tampering event occur. Potentially, this approach could give us 10,000's of eyes and ears and cause the balance to swing from being responsive to being preventive.

Gathering input from related organizations, such as the private sector marketing groups and associations, veterinarians, county extension agencies, and other state and federal government agencies, allows those organizations to be part of the information gathering and exchange effort and will be included in future collaboration to strengthen the information systems. In general, the broader the collaborations, the greater the impact and benefit that is likely to be achieved.

Evaluation:

As stated in the Project Purpose section, several of WDATCPs' functions are easily measured. The evaluation could show whether this project allowed the agency to perform more inspections, food and animal tests and consumer protection investigations.

Department managers are in constant contact with field staff, who will report back how the new technology enhances their efficiency. The evaluation will measure how much more time staff is able to spend in the field conducting inspections, and therefore, how many more inspections each staff member is freed to conduct.

Evaluators will also be able to judge the quality of the data obtained by Department field staff and the degree of participation. For example, a comprehensive data system would allow for the collection and storage of livestock information along with their geographical location, type of animal and herd size, a capability WDATCP does not presently have.

Unfortunately, emergency readiness is difficult to measure on a quantitative level in absence of an actual crisis. However, the agency does have response teams in place to deal with emergency situations involving toxins, animal disease and food contamination. Since the Department responds to roughly 50 emergencies per year, evaluators can go back and review the incidents

with team members to determine how the project enhanced readiness and how it can do more to prevent and/or contain emergencies during the course of the project.

Having the integrated customer database will enable the evaluators to reach the agency's wide-ranging constituencies and perform a formal survey of general customer satisfaction, ranging from anyone who filed a consumer complaint to those agricultural industries regulated by the Department.

A series of "listening sessions" will be part of the evaluation, modeled after a series of meetings WDATCP sponsored on agricultural product identification last year. About 60 people, representing both agribusiness and producers attended the meetings held from mid-August to late September 2001 in Madison, LaCrosse, Appleton, Eau Claire, Stevens Point and Platteville.

The input gathered at the meetings will help the Department design a pilot program for a uniform identification system for both livestock and crops that would allow tracebacks to farms to assist in protecting food safety, controlling animal disease, and reassuring trading partners.

As with the product ID initiative, the customers we serve must be the driving force behind this IT project. Obtaining their views in a group setting will allow for an exchange of ideas that could shape this initiative at the beginning and evaluate it at the end.