Visible Analyst Integrates McHenry County, Illinois

By Carl Pohrte, Jr., Information Services Administrator

Illinois' McHenry County, northwest of Chicago, has experienced an annual growth rate of approximately 18 percent. To accommodate this growth, the McHenry County Board, under the leadership of Chairman Diane Klemm, the Management Services and Finance Committees, and the County Administrator has developed a McHenry County Strategy Information Plan (McSIP). McSIP is in response to the demands of the increased public service information. Carl Pohrte, Jr., Information Services Administrator for McHenry County, is implementing the McSIP as an ongoing four year project to completely integrate all county offices, as well as to provide accessibility to county records for the public, local townships, cities and municipalities. The McHenry County Board and its elected and appointed officials share a vision of an electronically "integrated county."

The Mission Critical Systems described in McSIP include a Land Use System, and Integrated Financial System, County Recorder, Voter Registration, and Integrated Justice Systems, each with several subsystems. The Information Services staff is currently building data models and process models for each system. In addition to modernizing the county's computer-based applications, the Telecommunication and Network Service units of IS are reengineering the data communication infrastructure to weave all these systems together across the county.

To develop the McSIP and these mission-critical systems, Carl needed an effective, easy-to-use graphical analysis and modeling tool for client/server application development. He and others at McHenry County decided to use Visible Analyst Workbench (VAW) from Visible Systems. They have extensive experience with other CASE tools, such as ADW and IEF, but they chose VAW for its performance, ease of use, low cost, and compatibility with other tools.

Carl and his team use VAW in conjunction with Joint Application Development (JAD) sessions. JAD sessions are facilitated, structured, dynamic interviews with 7 to 12 members of a work group. The JAD sessions are used to define the scope, objectives and constraints surrounding the activities performed in

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McHenry County's business areas. The first task is to construct an overall Context Diagram, providing a view of each Business Area as though it were a single unpartitioned process, receiving stimuli from the outside world in the form of incoming information flows and responding in turn by issuing outgoing information flows. The organizations, systems, and persons who interact with, but are not part of the business areas are called External Agents. It is critically important in the early JAD Sessions to resolve the scope issues: i.e., to determine which activities are internal and which activities are external to the business area under study.

The Context Diagram, often drawn on a flipchart by Carl himself, acting as the group facilitator, keeps the scope issue in front of the panel at all times. The facilitator must have no hesitation whatsoever in revising the drawing to conform with the consensus emerging from his user panel. System analysts, acting as scribes, record the definition of each External Agent as well as the definition and rough composition of each data flow. It is very significant that this process carried our by Carl and his team avoids the premature use of computer technology. The facilitator in no way wants to inhibit the flow of the group discussion and feels that the rigors of the upfront use of computer drawn diagrams would introduce a chilling effect.

In addition to addressing the scope issue, the initial JAD Session uncovers the business events that are summarized by the Context Diagram. Each input flow is determined to register the initiation of some business event originating sat the behest of the External Agent and requiring some response from the business area. With the Context Diagram serving as the basic document, the task of enumerating all the business events is not completed until every data flow is associated with at least one event. Events tend to fall into two categories:
1) External Events – those that are initiated by External Agents
2) Temporal Events – those initiated by the passage of time or by the calendar, e.g., demands for tax payments.

The first JAD Session is concluded with the determination of the scope of the Business Area and the enumeration of the business events.

At the completion of the initial JAD Session, VAW is used to capture the Context Diagram using the dataflow diagramming tool. Definitions are recorded in the VAW repository. Each event is depicted in the form of a dataflow diagram containing a single process. Most events require the use of data captured from either previous occurrences of the event at hand or data preserved from the execution of other events. This business memory is depicted in the form of an information store. Events "talk" to each other through the use of common

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information stores. Thus, each event has the appearance of a mini-context diagram. Events are modular, in effect. That is to say, the scope of a business area can be increased by adding events or diminished by subtracting events. The analysts however, must make certain that no event is dropped whose goal is to populate the information stores with data required by other events.

The Context Diagram and Event Diagrams are all instances of data flow diagrams. The Event DFDs are, in effect, children of the Context DFD. VAW offers an important facility that permits the analyst to select the process at the center of the Context Diagram and to invoke a decompose function. This produces a Decomposition Diagram depicting the Context Process and Event Processes in a single hierarchical diagram.

Between initial and the subsequent JAD Session, the analysts have recorded the Context and the Events in VAW and populated the repository with definitions. All subsequent JAD Sessions begin by reviewing the diagrams and text that have been recorded in VAW by the analysts. Users are encouraged to make changes whenever they notice errors in the diagrams or definitions, or even if they have second thoughts about scope issues. Users and analysts continue this collaborative, iterative process, moving from event to event. Essentially, the work proceeds from the big picture (as recorded in the Context Diagram) to many smaller pictures (as seen in the Event DFDs).

Since the larger work group, or committee of the whole, is needed to establish the boundary issues related to the scope of the business area, the analysts can schedule smaller interview sessions, for developing the details of each event. Once the specific business events having been identified, the task becomes that of documenting the business rules that animate the processes. The expertise needed here involves fewer users, thus allowing the teams to conduct concurrent interviews in completing the requirements gathering.

For business logic modeling, McHenry County analysts record the business rules in English-like scripts using a modeling tool. These scripts are used to generate logic flow charts graphing the business rules involved in converting input to output flows in the event-level data flow diagrams. The users review the logic flowcharts and suggest changes in much the same spirit as they have reviewed the DFDs. Changes to the flowcharts are accompanied by changing the scripts, (which the users are not shown Carl has been very careful to instill in his development team the willingness to make changes so that users recognize the products as conforming to their understanding of the business rules. The analysts impose nothing but the discipline of using the tools to faithfully record

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the user views. The scripts are actually stored in a window in the VAW repository.

One Business Area under study is that of a School Bus Driver Permit Control, involving several entities, such as the school bus driver, the district doctor, the Illinois State Board of Education, other state licensing departments, and the regional school superintendent. This Business Area includes such events as: School Bus Driver Registers for Initial Refresher Course, Illinois Board of Education Notifies Regional School Superintendent of Driver's License Status, etc.

For structuring the contents of the information stores, the analysts, under the guidance of the Data Base Administrator, build Entity Relationship Diagrams (ERDs) for each detailed event. VAW has the capability of synchronizing the event-level ERDs into a Global ERD. VAW also allows the analysts to perform quality assurance tests of their models. For example, a request for a repository key analysis causes VAW to identify problems with primary or foreign keys. McHenry County's methodology encourages incremental development of the data model with frequent verifications of the correctness of the model.

The result of this development work is a set of integrated diagrams that support both data and process views of each business area. Much tedious work is avoided as the models consist of only diagrams that serve primary objectives. Thus, Carl and his staff build no intermediate DFDs because 1) the VAW repository provides the facility to produce a decomposition diagram on demand and 2) the VAW repository provides mechanisms to expedite the task of balancing data flows and External Agents as they appear at the Context Diagram level and as they appear at the Event Data Flow Diagram level.

Carl attributes much of his team's successes thus far to the use of VAW. They have found VAW to be useful for the rapid, easy, iterative development necessary to collect detailed and accurate user requirements.

When the McSIP (infrastructure and mission critical systems) for the "integrated county" is completed, county residents will be able to dial up to various offices from their telephone or PC and check on public recorders, traffic violations or taxes. The new systems will enable residents of McHenry County to conduct their business quickly and easily. As changes inevitably occur, the modeling tools in VAW will expedite the maintenance of the applications they are currently being used to structure.

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