NYISO Online Presence Project
Research Summary

Summer 2001

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Overview

NYISO has contracted Sapient to evaluate findings and make recommendations for improving the current NYISO public Web site and the MIS application, or Online Presence. Sapient and NYISO conducted a ten-week project to

- Make it easier for customers to do business with NYISO, and
- Position NYISO as the industry leader: a responsive, customer-driven organization and a standard-setter for a regional ISO.

So that we could effectively reach the project objectives, we

- Defined and gained an understanding NYISO customers through user interviews with the market participant and professional user groups,
- Determined how the Online Presence is currently performing by assessing the applications,
- Gained an understanding of the competitive landscape through executive interviews and an assessment of competitive tools,
- Identified common themes by developing a user needs framework and a competitive context, and
- Developed recommendations and a market positioning platform.

Participants

Observations and interviews were conducted with the following organizations:

- Central Hudson Gas & Electric
- Consolidated Edison
- Constellation
- Dept. of Public Service
- Energetix
- Exelon Power Team
- FERC
- Law Firm of Jessica Bacal
- LEPCORP
- Mirant
- Niagara Mohawk
- NRG
- N Y Consumer Protection Board
- NY Power Authority
- New York State Electric & Gas
- Orion
- Pacific Gas & Electric (PGET)
- Pace Energy Project
- Slater Consulting

- Strategic Energy
- Times Union
- Village of Rockville Center
- Westchester RESCO

Research results

Several key points of contact form the public face of NYISO. The performance of these systems and individuals shape customers' perception of NYISO. The contact points are
- the Market Services organization,
- the Web site,
- the MIS system,
- the working group and committee structure, and
- the TIE list.

These contact points are perceived mostly negatively by customers due to unreliable system support of the user's tasks and business needs as well as the lack of effective communication. These problems result in a lack of trust in NYISO, frustration, and dismissive attitude towards NYISO tools. Ultimately, all problems are blamed on NYISO.

We believe that there is a window of opportunity for NYISO to reposition itself as responsive and customer-driven because
- A number of customers have a sympathetic attitude towards NYISO,
- Customer attitudes are still evolving (most are frustrated but not yet dismissive) and,
- The market is young and people are still developing systems and processes.

While it is unclear how long this window of opportunity will last for NYISO, taking quick action to address these gaps before they become fixed in the minds of the customers will allow NYISO to more easily reposition itself. A focus on fixing and enhancing the key points of contact can maximize the opportunity, allowing NYISO to achieve the goals of making it easier for customers to do business with NYISO.

User needs framework

Ensuring that user research findings are used to define the recommendations and direct system design is a way for NYISO to be a customer-driven organization. A framework was developed that organizes and summarizes the user research findings and opportunities uncovered during the define phase.

Market transparency - "Show me the inside of the black box."

Market Participants and Professionals do not understand what is happening in the market and why. People are hungry for detailed training, systems that will better support bidding processes, and help visualizing market data.

Data accessibility - "Give me what I want, when I want, how I want it & nothing else."

People are tired of having to struggle through NYISO systems to get basic answers like bid status or LBMP prices over time. People are seeking more control over how data is presented and downloaded and want it personalized for them.

Experience - "Let me do my job well."

Users frequently get system errors and struggle with processes, standards, and data formats that do not support the tasks they need to complete. This causes them to perceive NYISO as unresponsive, unreliable, and unprepared.

Collaboration – "We are all working though this together."

Users liked the collaboration of the committee structure but thought issue resolution was slow. They are not happy with overall NYISO support and resolution. Provide better two-way communication and collaboration through appropriate tools and processes.

Consistency - "Be there when I need you."

Distrust of NYISO is triggered by things like the errors generated by the applications, slow response times to customer questions, and the late posting of information to the web site. NYISO seems to be providing less than the minimum level of support and availability, but is expected to deliver more than the minimum.

Applying the framework

Each area of the framework should be considered in the design and evaluation of future solutions. This type of systems approach to the problem will result in innovation and breakthroughs; without it only incremental solutions can be achieved.

Recommendations

Overview

The following are overall recommendations that emerged from the Online Presence initiative and represent many themes we observed through user research as well as key observations from the assessment of the application, competitive assessment, and market positioning work. As with any technology implementation, for overall success of the initiative NYISO may need to modify processes to meet overall vision, goals, and objectives. In previous sections we have separated the solutions that are in scope for the Online Presence initiative from those that are larger observations or themes to be considered by NYISO. However, the recommendations consider all opportunities in order to paint a complete picture of the work done thus far.

Promote a regional perspective

A key NYISO objective is to ensure reliability and efficiency on a regional level by putting in place a compelling business model, and sophisticated technology based on open standards.

The Online Presence initiative can help NYISO by:
- Building trust and credibility by creating a best-in-class interface application;
- Gaining efficiency for the MPs by solving some of the seams issues. This may be accomplished by partnering and integrating the major applications used today like OATI (to create the NERC tag) and EnronOnline (for electricity trading) with the NYISO application;
- Designing an application which is compliant with the industry XML standard; and
- Building new tools with a regional flavor:
    - Regional Maps showing status, information, and data like prices for the entire region,
    - Customizable controls to allow the user to view the hours of the day as "Hour Ending" or "Hour

    - In the case of exports to PJM or imports from PJM, on entering the transaction into the NYISO application, we can provide the MPs with an XML file in PJM XML format that they can upload to the PJM application,
    - Automatic XML feeds can be designed to further streamline communication between NYISO and neighboring ISOs and Transmission Owners, and
    - An "Energy Portal" which can be a stepping-stone to automatic feeds and seamless data transfer. It would allow users to get to other Web applications

they use regularly, like OATI, without having to login again (punch through using single logon packages).

Major NYISO activities that should be pursued in conjunction include:
- Successful handling of the summer of 2001 for the state of NY, keeping in mind all the constraints and issues;
- Creation of an industry XML standard;
- Partnering with the major players like OATI, and EnronOnline;
- Partnering with organizations that can provide NYISO with information and data outside New York state;
- Streamlining the checkout process; and
- Solving seams issues at a market level, for example, market closing times that are synchronized across the regional ISOs.

Create a centralized information architecture

Currently the site is divided into several disjointed Web sites that contain different components. For example, the CSS application and the MIS application cannot be accessed from within each other. This division is evident from a user experience perspective as well as from an implementation perspective even though some of the technical components like the Directory (LDAP) are shared.

All NYISO Web applications should have a single point of entry and centralized authentication. The users should go through this channel of authentication and be presented with a single user experience that consists of all the functionality they are authorized to access. This single, centralized information architecture will ensure a smoother user experience and make it easier to do business with NYISO.

There are several advantages of this scheme.
- It is efficient for users because there is one place to go.
- It will allow for synergies between application components, for example display of market data during the creation of a bid or showing the bid schedules while verifying the daily advisory statement.
- It allows for reuse of underlying objects and code.
- It helps build a consistent level of security for the entire application.
- It improves security, as there is only one channel of authentication that can be tightened or loosened as

required. Having multiple security channels is higher risk and makes it all the more difficult to maintain.

As a part of the Online Presence Project the following activities could be conducted:

- Create a common visual look to unify the online presence.
- Create a seamless user experience and allow users to shift between tasks and information more fluidly.
- Re-architect all of the applications so that there is a single user interface for interacting with the NYISO.
- Implement a single logon.
- Create levels of security for all components of the application, including content, content searches, screens and controls.
- Implement role-based authorization security using the access control lists model.
- Implement seamless punch through to other energy Web sites (partner sites). NYISO can partner with the major players like OATI, EnronOnline to build a pipeline of for integration of other applications.

Ensure alignment with the user needs framework

As a part of the initiative, we have summarized the requirements of the MPs and Professionals into a User needs framework that can be used as criteria for making decisions when prioritizing features, phasing work, and validating solutions. Adopting this tool will go a long way for NYISO to meet its user needs and business goals and gauge progress in achieving the objectives. NYISO will truly then be "customer-driven" and "customer-focused."

The Online Presence Project will initially use this tool to select and prioritize the functionality of the phased releases regularly during the development process to ensure that project objectives are met. NYISO can also benefit by using the framework as tool for evaluating business processes.

Design a user-focused solution

The best approach to designing an application is to use a user-centered design approach and base the user needs making on the user needs and task flows.

The reasons to use this approach:

- Focuses resources on features that achieve maximum user benefit from minimum investment and an optimal ROI

- Ensures ability of the user to be more productive (i.e. to complete tasks in less time with fewer errors) and more satisfied

This should be reflected in the Online Presence initiative by:
- Designing to a task flow based interface architecture
- Incorporate checks and balances in the form of usability testing to prevent disconnects between what users need and what is designed and implemented
- Developing a detailed content strategy to deliver relevant and focused content to the user

We also recommended that NYISO use a user-centered process in any decision making, such as designing a communication plan or redesigning training modules, to ensure a consistent focus on users.

Improve the quality of an MP's day

The MPs feel that their time is best spent analyzing data and developing improved strategies based on an advanced understanding of how the market functions resulting in better profitability for their company. It is a benefit to NYISO that these MPs with their knowledge of the power industry actively participate in the NYISO working group sessions and committees to develop improved business rules.

During the user observations it was found that traders, even senior traders and plant managers, spend a major part of their day attempting to enter transactions into the MIS application and dealing with errors and seams issues related to bilateral transactions.

Professionals also find it difficult to cope with all they need to accomplish in their jobs, due to an overload in communication and collaboration and/or an inability to find what they need.

NYISO can add tremendous value by
- Providing tools which are very efficient to reduce the time that the MPs spend mechanically entering transactions so that they can spend the remaining time analyzing market data or participating in NYISO committees
- Providing a level playing field for these MPs by enhancing different channels of entry, like manual using web interfaces, CSV file upload, or automatic feeds
- Developing a consistent communication plan for MPs and Professionals which will give them the information they need for doing their jobs

- Building ways to help users find what they need (e.g. proper search functionality)
- Developing a detailed content strategy to improve nomenclature of documents and improve consistency of posting data

Improve MP participation in NYISO

NYISO wants to make a more liquid market and reduce the barrier to entry into its markets. This will be most effective in proving that the NYISO markets not only work but also are thriving hubs of activity.

For this to happen, involvement in the market is very important:
- Many MPs are not "bound" to NYISO due to geographical or other reasons.
- They compare NYISO applications and market rules to what they have seen in other regions like PJM.
- Being well-funded and technically advanced, they will expect more advanced applications.
- They are aggressive and work under tremendous pressure, especially in the Hour Ahead Market, and need data to make split-second decisions.

Currently there are also many barriers and challenges such as:
- Some MPs do not tolerate price changes (one MP said "I don't care if the price is wrong as long as it doesn't change.").
- They stay away from the tremendous cash flow issues currently occurring in the billing cycles.
- They have to deal with seams issues like transaction curtailment.
- They have to enter the same information in five different applications currently taking over 25 minutes at times to enter just one bilateral transaction for the export or import of power.
- They are averse to inconsistent posting of data and the competitive advantage some other organizations will gain by accessing the information earlier.
- They need faster posting of information like FERC announcements.

On the other hand, some smaller players find it difficult to diversify and participate in the market because of:

- Lack of knowledge of all the risks of playing in these markets,
- Lack of trust in market rules and the ability of NYISO to maintain a fair market. They see trends they cannot explain themselves and which cannot be defended by NYISO in a open and clear manner,
- Lack of trust in the applications because they just take too long and do not behave consistently (e.g. missing bid schedules),
- They feel that their Customer Relations Representatives are over-worked and do not receive good support from NYISO to answer their questions,
- Some of them have pending monetary issues with NYISO which have not been resolved for several months; they cannot risk similar potential issues until they see that NYISO is actively working to resolve the current issues; and
- They sometimes also perceive NYISO as a bully.

There are many things that will help remove the barriers:

- Reducing seams issues, like better coordination of checkout and looking into making market closing times closer to each other;
- Integrating with regional players;
- Making the application more robust and efficient;
- Providing historical data, like bid schedules, which are consistently maintained and accessible;
- Backing up data to prevent losses;
- Adding more markets like ICAP/TCC or financial markets;
- Providing more transparency into how the market works, more granular data, summaries, reporting capabilities, real time data, and better notifications and alerts;
- Reducing price corrections:
  - Correcting any bugs in the scheduling and billing engines that cause the price corrections, and
  - Stricter market monitoring and eventually more robust market rules and validations in place at the bidding stage itself, to prevent intentional and unintentional gaming of the markets
- Converge faster to a more accurate bill:

- Preventing ambiguity by giving MPs enough data and explanations in the bill to figure out the bill on their own;
- Providing the MPs with a FAQ database where they can find resolutions to their issues, allowing Customer Account Representatives to be utilized more effectively in managing the more specific and more difficult issues;
- Using more accurate data earlier in the process and providing MPs with more transparency into the process by giving the source of the data and the stage of quality of that data (e.g. metered/estimated);
- Reducing the number of re-bills; and
- Faster resolution of billing issues that still exist beyond those resolved by the above steps
- Building a content strategy around timely posting of data and information; and
- Working towards distribution of FERC announcements and other alerts to the MPs sooner and more effectively.

Enable visualization of data

In many cases, we identified that MPs would benefit if they could view data visually. Hence we should provide the user with a set of visual tools to easily interpret data and gain an understanding of activities and trends.

This model serves the following functions as it makes it easier to do business with NYISO:
- Improves data accessibility for all users;
- Improves market transparency, for it gives MPs a view into market status and trends so they can ask more educated questions and hence irrelevant data requests are reduced;
- Reduces the need for MPs to do in-house development of applications for common data views (such as LBMP over time) and eliminates the need for small MPs who do not have the resources to build tools by raising the basic level of tools and support; and
- Allows irregularities to be easily identified (by MPs and NYISO) by providing trending graphs.

The Online Presence initiative can build customizable charts, maps, alerts, and provide status for the user.

Enable multiple channels of communication (input & output)

We recommend the enhancement and development of three channels for MPs to do business with NYISO (i.e. to enter bids) in order to accommodate and support the diverse needs of the MPs.

The three channels are:
- Manual entry of bid data using the transactional Web site,
- Posting of bid requests through the upload utility, and
- Automating transaction through automatic feeds into MIS.

MPs are a diverse group in terms of their channel preferences. They differ in the number of transactions they conduct with NYISO, and the level of expertise and ability to build systems for integration. As a result, there is value in supporting all three channels, as they make sense for a certain subset of the market participants.

What the Online Presence initiative can do is
- Enhance each of the channels (for example, for CSV uploads we can provide Excel templates),
- Implement the integration requirements for the automatic feeds channel,
- Participate in the creation of the industry XML standard,
- Design more fluidity between two channels and the user experience (download a CSV from a manually entered transaction), and
- Enable a smooth transition for MPs from a less sophisticated to more sophisticated channels. Support a smooth transition from manual data entry to the uploading of CSVs and finally to the use of automatic XML feeds without requiring extensive development effort. Provide a clear transition path with proper instructions and support.

MIS Channels	Positives	Negatives	Potential Solutions That broaden the channel or make it more compelling
Manual entry	• Allows for full communication between NYISO and MPs • Opportunity to build a relationship, market position through visual messages and promote NYISO as RTO • Lesser development costs • Easy to use • Requires less technical expertise • Quicker start up times	• Difficult for a large number of bids • Poor user experience	• Co-brand • Energy portal • Cut/paste, or carry forward functionality
Upload CSVs (CSVs created using Excel or internal tools)	• Easy form of integration • Fast for larger volumes • Allows MP to incorporate other data into creation of bids • MPs can develop their own front-ends • More extensive reporting	• Requires technical expertise and implementation effort • Not transparent; have no view into the upload process • Can do reporting but currently difficult to convert CSV files into useful report and forms	• Provide Excel templates • Provide XML file of transactions entered into NYISO for upload into other applications, like PJM • Provide better retrieval and archival of uploaded transaction status • Activity log
Automatic Feeds	• This is the way of the future, total and seamless integration • Integration is very important in getting NYISO to gain RTO status	• Currently only one of the interviewed MP automatically posts the CSV file to MIS • Not all MPs will have the technical expertise to respond to the integration requests from their end • Less opportunity to add market positioning elements	• Full API for reporting • Hooks for system alerts • Ability for MPs to submit alerts to NYISO such as derated units • XML industry standard

		- Less opportunity to build relationships - Involves NYISO development effort - Expensive for MP - Requires tool development	

Personalize the experience

The redesigned Online Presence should present users with the controls and information that are customized to their needs.

Currently the users are overwhelmed with the tools they have and communication that they receive. For example, they find it quite inefficient to scroll through a huge list of all sources and sinks to enter a bilateral transaction. We recommend providing the user with focused information and the ability to adapt the interface to their tasks.

Several pieces of functionality can be built by the Online Presence initiative to meet these requirements:
- Provide modifiable settings or parameters.
- Store key previous actions (last generator selected from pick list).
- Allow the user to pick the format and form of communication that is most suitable.
- Allow the user to subscribe to various threads of information at a more granular level.
- Allow the user to store and modify user preferences and apply them to the screens and channels of communication.
- Provide the ability to show the same data in multiple formats through multiple channels (e.g. wireless, partner Web sites, PDA, email).
- Develop an information architecture and design should be able to handle and facilitate the above flexibility (for example, a screen should not break visually if a certain preference is reset by the user and a certain view is removed from the screen).

In addition, NYISO can take the following steps:
- Revise communication with the MPs and Professionals and send them only what they require.
- Prevent duplicate data from reaching the MPs that prevent from overwhelming them.
- Introduce some ground rules based around etiquette on its list servers (e.g., standards on how to format the subject line and to whom to send the emails).

Build a strong foundation

A chief objective for NYISO is to ensure reliability of its transmission and operating systems and applications. Hence a robust and flexible technical and visual architecture based on open standards that will support the needs of the users and NYISO is essential.

This unfolds into major action items or themes for the Online Presence initiative:
- Ensure that the underlying technology is stable and fault-tolerant.
- Make the design more modular and flexible (e.g., separate content from its presentation, so content can be aggregated from multiple sources and displayed or conveyed in multiple formats and styles).
- Provide a sufficient level of error handling to prevent users from entering incorrect data (either intentionally or unintentionally) that may render the transaction ineffective or may allow them to game the market.
- Display properly constructed messages and message status informing users if transaction went through or got rejected, the reason for the action and what steps they may take to correct the transaction.
- Ensure that the application behaves consistently (i.e. the same actions should result in a same response).
- Ensure that the application and underlying architecture is able to meet the performance requirements as a scalable, flexible technology platform and information architecture.
- Provide reassurance to the user around transactions (for example, when the user enters a generator bid, they should get verification before the bid is submitted).
- Make all historical data consistently available, users should be aware of the archiving process and know when it will occur.
- Design and build a modular multi-tier architecture to support this functionality.
- Universal XML messaging within the components of the application and to external systems.

Ensure a reliable and robust power market

The most important objective for NYISO is to ensure the reliability of the transmission grid and that every home or business in NY State gets energy and at a reasonable rate.

There are several suggestions in this area by MPs:
- Professionals suggested that NYISO should not rely completely on the markets to provide this security and involve itself more in planning activities.

- Several MPs asked for better efficiency of communicating data by removing the need for a Transmission Operator to be the conduit for data transfers between Generators and Load Serving Entities and NYISO.
- NYISO should actively work towards adding checks and balances into its market rules so that it is more robust and it becomes more difficult to "game" the markets. The markets need to come to a point where both NYISO and the MPs have faith in them.

Next steps for the Online Presence initiative

Moving forward, we will use the user needs framework to prioritize and evaluate the success of the rest of the initiative.

We want to define the breadth of the solution and its final form. This will form the overall goals for the solution and help create the strategy to reach that goal.

There are pain points and lessons learned from the MPs that will also form a good source of feedback for NYISO and we also want to distribute what we heard from the MPs and provide some overall recommendations.

There are many action items and a great deal of functionality that need to be put into place as a part of the Online Presence Initiative. We plan to use a methodical and phased approach to implement them.

We will use the user needs framework of criteria developed to work with NYISO to map the action items and functionality to the future phases of the project and call out the dependencies. We cannot allow regression in the functionality currently provided to MPs, so the first phase will have to provide all the existing functionality in a redesigned form.

At a high level, the future phases will have:
- A Design phase in which:
    - The functionality and information architecture will be conceptualized with an eye to making the design scalable to meet the needs of the future phases and flexible to allow reuse of design patterns and components, and then
    - Detailed design will be carried out based on feedback using prototypes, business design workshops, usability testing. A custom versus package decision will be made for all the software components and packages will be identified and selected for all package-driven components. Participation of MPs in the usability and business design phases is critical.
    - The technical aspects of the solution will be ironed out keeping in mind integration points between custom components and package components and between the application and external systems;
    - Proofs of concept will be implemented to reduce the risk going into implementation;
    - A detailed object design will be completed for implementation; and
    - Detailed planning will be done for capacity and performance, database transformation, build and release process, development standards and review processes.
- An Implementation phase in which:
    - The components of the phased solution will be built, integrated with other systems and tested at a unit and integration level; and
    - Test scripts will be created to test all aspects of the application including negative cases.
- A User Testing phase in which:
    - A small subset of MPs, Professionals and NYISO members test the entire application and its integration for bugs and possible future enhancements; and
    - The bugs and enhancements found will be categorized and prioritized and fixed by the development team before the pilot phase.
- A Pilot parallel phase or a soft live phase in which:
    - MPs and NYISO can test the new application and its interface points before it goes into production.

There will be other factors that will govern the length and structure of these phases:
- Budgetary constraints,
- Client expectations about when they want to see results (tangible changes to the site),

- Constraints around when a release can go out to clients, like seasonal and live date constraints,
- Review process involving the committees and working groups,
- Availability of MPs to participate in the usability and design workshops and user testing phases, and
- Availability of NYISO key business people and stakeholders in the design and planning workshops.