

Alliance for Building Regulatory Reform in the Digital Age

A Public/Private Partnership

CREATING A STATE-OF-THE-ART INTEROPERABLE BUILDING REGULATORY SYSTEM

Report on the September 24, 2003, Summit & Follow-up Work Materials
to the Information Technology Industry for Review & Comment
March 23, 2004

A. Introduction & Purpose of this Report

In the United States today, less than 8% of the 44,000 jurisdictions that adopt and enforce building codes make effective use of information technology in their building regulatory processes. On September 24, 2003, 55 representatives from the software, hardware, building regulatory and construction communities came together at The Downtown Association in New York City to identify opportunities, challenges and potential solutions to bring about greater use of information technology in the building regulatory process by taking steps to facilitate industry's production of interoperable hardware and software.

This report serves two functions. First, it provides the nation's software and hardware industry with a copy of the Final Report from the Summit (Attachment A). Second, it provides for your review and comment work materials that the IT industry representatives attending the Summit requested state and local government and the Alliance develop. These materials are designed to gain your input on the Alliance's work and encourage you to join with your colleagues in the information technology, construction and building regulatory communities to work together to facilitate the generation of interoperable hardware and software that jurisdictions can use in their building regulatory processes. This would help streamline the nation's building regulatory system and expand the use of information technology.

Based on the Summit action items listed below, the attached follow-up materials provided for your comment with this report are:

1. **Summit Action Item:** That an expanded Alliance work group (Expanded Core Work Group) comprised of state and local building officials undertake an analysis that identifies and prioritizes functional interoperability requirements of a diverse array of state and local building regulatory programs.

Material attached: Attachment B - *Follow-Up Action from the Summit on Streamlining – Development of Listing of High Priority Use Cases, User Functionality Priorities*

2. **Summit Action Item:** Provide, from the building regulator's perspective, the definitions and characteristics and capabilities of currently available commercial software and gaps in current approaches.

Material attached: Attachment C - *Report on Characteristics & Capabilities of Currently Available Commercial Software & Gaps in Current Approaches, Implementations & Technologies*

3. **Summit Action Item:** Gather information on other interoperability efforts.

Material attached: Attachment D - *Interoperability Background Study for the National Alliance on Building Regulatory Reform in the Digital Age*

In addition to the above actions, the software industry attendees at the Summit requested that a mechanism be established in which the software and hardware industry can come together on a regular basis to interact with the Alliance in continuing to work towards interoperability. To that end, the following two actions have been taken:

1. The Alliance has produced this report and has scheduled a meeting of the Technology Task Force with the software industry at 10:00 a.m. (Eastern Standard Time) on March 30, in Washington, DC, to review and comment on its contents. In addition, the Alliance has set a conference call to also receive your input at 3:00 p.m. (EST) on March 29.
2. The National Conference of States on Building Codes and Standards (NCSBCS), as Secretariat to the Alliance, has followed up on a recommendation made by the software industry attending their annual meeting in Portland, Oregon, in October 2003. NCSBCS has established an Information Technology Industry Advisory Subcommittee to provide a forum through which the software industry can provide regular input to state and local building regulatory personnel on issues regarding interoperability and greater use of IT in the nation's building regulatory processes. (Visit the NCSBCS website at www.ncsbcs.org for more information on how to become involved in the Advisory Subcommittee.) That subcommittee will be meeting by conference call at 11:00 a.m. (EST) on March 25 to discuss this report and possible next actions by industry.

Input requested from software industry:

As noted in Attachment A, the Alliance's Expanded Core Work Group provided the software community with the work products that were requested at the Summit. Your colleagues at the Summit recently reviewed these products and requested that the Alliance invite your firm to join them in this project and also provide your comments on those materials. We would also like your comments on future actions the Alliance can take to create additional technologies and requirements needed to further advance the development and implementation of a state-of-the-art integrated and interoperable building regulatory and construction system for our nation. In addition to the Alliance's questions in the transmittal letter to this report, a list of specific

questions being asked of the software community by the Alliance is found on pages 10-11 of this report.

In general, these questions ask you to comment on the validity of the information provided from your firm's perspective, and ask you to offer any recommended changes/corrections you have to the reports and technical documents contained in this package. These are changes that you recommend be made in any of the attached documents prior to their being used to plan a follow-up summit meeting and incorporate an interoperability statement into the Alliance's Model Procurement Guidelines. Your recommendations as to future actions to build a state-of-the-art integrated and interoperable building regulatory system for our nation will be used to direct future actions by the Alliance.

B. Background to this Report – Expanding the use of information technology in the building regulatory processes

The National Alliance for Building Regulatory Reform in the Digital Age is a public/private sector partnership established in the summer of 2001 to enhance public safety and economic competitiveness of our nation by enabling our construction industry to build “faster, better, safer and at less cost.” The Alliance was formed as the outcome of a national forum which brought together representatives from the nation's construction and information technology industries and state and local building regulatory officials to identify approaches towards reducing the barriers to more effective application of information technology in the nation's 44,000 state and local jurisdictions that adopt and or enforce building codes.

From 2001 through the summer of 2003, the Alliance, with funding support from federal agencies and in-kind services from its members, developed a series of work products designed to help both building regulatory and elected officials remove barriers to more effective use of hardware and software by their building departments, including model procurement guidelines.

Among the barriers identified by state and local building departments was the need for future procurements by state and local governments to require that hardware and software be interoperable. While a number of software vendors produce a series of fine products for various aspects of the building regulatory process (e.g. online permitting, plans tracking, field inspections, etc.), the Alliance found that those products could only transfer data within their own product line and not between the products of different vendors. This fact restricts the ability of a jurisdiction both to share data between different agencies within that same jurisdiction or, in case of a natural or manmade disaster, to share the data between different neighboring jurisdictions.

To address this issue, the Alliance, with funding support from the National Institute of Standards and Technology, in August 2003 established a Core Work Group. Comprised of state and local building regulatory officials, NIST, NCSBCS and FIATECH personnel, that group was charged with: reviewing existing state and local government building regulatory processes, determining which functions within those processes needed to be interoperable, and drafting an

interoperability statement that could be presented to an audience of state and local building regulatory officials, construction industry and hardware and software vendors.

These materials were generated by the Core Work Group. The New York City Department of Buildings, together with the States of New York and New Jersey, invited the building construction, regulatory and software communities to send representatives to a Summit meeting in that city to review the draft interoperability statement and discuss steps that these three parties could take to advance the creation of a state-of-the-art integrated and interoperable building regulatory system.

C. The Summit on Streamlining the Building Regulatory Process Through Interoperability – September 24, 2003 – New York City

1. Objectives

The purpose of the Summit on Streamlining the Building Regulatory Process Through Interoperability was to speed development of technologies and requirements needed to advance the creation of state-of-the-art integrated and interoperable building regulatory system by bringing together building regulatory officials and representatives from the software and construction industries to:

- Share an assessment of the opportunities, priorities, and challenges for streamlining and automating the building regulatory process.
- Present and refine data requirements and key principles for achieving the needed interoperability of hardware and software used in the regulation and design of buildings.
- Present and refine an interoperability statement that can be included in government procurements of hardware and software used for codes administration and enforcement.
- Discuss common actions that can be taken by participants to speed the use of interoperable hardware and software by state and local governments.

2. Invitees

The Alliance issued a national news release and extended formal invitations to representatives from those software and hardware firms that the Alliance knew were then engaged in providing services to state and local building departments for use in their building regulatory systems.

Invitations were also sent to state and local code officials including members of the National Conference of States on Building Codes and Standards and the Association of Major City and County Building Officials who represent the chief building regulatory personnel of the states and major jurisdictions in this nation.

FIATECH, working with its Alliance partners, identified several major firms with interest in the issue of interoperability to serve as representatives from the construction industry at the Summit.

From these invitations, 18 representatives for the software industry attended the program. Thirteen attendees came from the construction industry and 24 came from federal, state or local government. The software industry attendees estimated that the firms they represented accounted for over 80% of the volume of sales to government for software used in the building regulatory process.

3. Materials

The Core Work Group, on behalf of the Alliance, produced the following documents for distribution in advance to all Summit attendees:

- a. Vision of Interoperability for Capital Facilities and Building Regulatory Processes (Produced by the City of New York Buildings Department)
- b. Draft Interoperability Statement that would be included in future model procurement requirements.
- c. Draft High Level Building Regulatory Process Diagram – Showing building regulatory processes that need to share data.
- d. Draft Process Functional Description and Services – Describing what data needs to be interoperable.
- e. Draft Listing of Common Data
- f. Nine Building Regulatory Process Documentation Maps (showing data exchange points) including: Licensing, Permit Issuing, Plan Review, Inspection, Materials & Equipment Certification, Initial Registration & Inspection, Complaint Processing, Enforcement and Equipment Registration
- g. A copy of the Executive Summary from the FIATECH Capital Projects Technology Roadmap Initiative.

These materials were designed to provide adequate background information to engage all of the participants in a detailed discussion regarding the need for, barriers to steps to develop a better definition of interoperability for inclusion in model procurement specifications.

Copies of the above materials were included in the notebook distributed at the Summit and are available for review on the Alliance portion of the NCSBCS website by clicking on “Summit Materials” on the banner on the homepage.

4. Program

To achieve its objective, the Summit program was divided into four sections. An opening session and three breakout work sessions: late morning, early and late afternoon.

The Opening Session included a welcome from the hosts, presentations on the objective and purpose of the Summit, an introduction of the work materials to be reviewed and an overview of the meeting's structure and objectives of each of three work sessions planned during the day.

The three work sessions were conducted as follows:

- a. The morning work session focused on "Opportunities & Challenges of Interoperability." In this session, each of the three audience categories met in separate discussion groups to draft a list of opportunities and challenges from their particular industry's point of view: Group 1 Software/Hardware Vendors; Group 2 Construction Industry; and Group 3 State and Local Government Officials. Each of the groups also reviewed and offered comments on possible changes to the draft interoperability statement prepared for this program.

Input generated from that first work session was then shared with all attendees in a report-out session and was compiled on computers by the Summit's facilitators. That input was then used as a point of departure for the next breakout session.

- b. The early afternoon work session focused on Solutions & Milestones to Achieve Interoperability." For this session the audience was split into three work groups with each group having equal representation from the construction, software vendors and building regulators attendee categories. Facilitators assisted each of the three groups in reviewing the output from the morning's work session and then generating their own list of solutions and milestones to achieve interoperability.

Input generated from the second work session was compiled using computer templates (see Appendix) to ensure uniformity and then shared with all attendees in a second report-out session with all participants in attendance.

- c. The late afternoon work session focused on "Expressions of Interest in Moving Forward with Recommended Solutions – Next Steps," and was held in a plenary session. Output from the early afternoon work sessions was discussed and attendees were asked to identify next steps that they would be willing to support towards the objective of the Summit. A list of mutually agreed upon "Next Steps" was generated in this session and recorded. The Alliance promised to compile a raw summary of all comments generated during the program, assemble the list of next steps and comments on the draft interoperability statement and provide that material to all Summit attendees for their review and comment prior to producing a report on the Summit.

5. Output

The output from the morning session Breakout Session on "Opportunities and Challenges from Interoperability of Software for Building Regulatory Processes" was an extensive listing of benefits of interoperability. These included a listing of specific benefits that would be derived for the software, construction and regulatory communities from an expansion in the size of the

marketplace created by interoperable software, including greater access to the 40,000 jurisdictions that today do not use software in their building regulatory processes. The benefits also noted savings in construction costs for the construction community and reducing the cost to and increasing the efficiency of state and local government as they serve their clients in their communities.

The morning Breakout Session identified as challenges issues of timing and funding, and organization and process challenges to all parties including the need to get diverse array of jurisdictions together to define and prioritize for the software industry common data exchange requirements.

In the early afternoon Breakout Session attendees focused on “Solutions, Priorities and Milestones in Achieving Interoperability.” Out of that session a series of recommendations and suggested timeframe for future action were generated.

The three recommendations and their priority ranking were:

- a. Expand and diversify the Core Work Group by adding jurisdictions of more diverse size, different regions, to have them review the interoperability statement, identify high priority use cases (data exchange requirements), process maps and look at gaps in current software available for use in the building regulatory process. **HIGH PRIORITY - Do Immediately**
- b. Continue to refine the draft interoperability statement and support materials developed for the Summit and share with stakeholders by broadening stakeholder involvement in this project. Involve not only as members of expanded core work group but also in software industry advisory group both of which will define their roles in continued participation in this project to establish national goals, gain commitment for interoperability. **HIGH PRIORITY - Do Immediately**
- c. Get jurisdictions across the nation to commit to interoperability and, where necessary, to the reengineering of their regulatory/administrative processes to facilitate and benchmark the process and make effective use of interoperable information technology as it becomes available. Included here is the need for jurisdictions to standardize their procurements and consider financial incentives to software suppliers who demonstrate interoperability successes. **HIGH PRIORITY - Do Immediately.**

For more details, see **Attachment A** - Final report on Summit issued in December 2003

D. Post-Summit Work – Expanded Core Work Group – Jurisdictions to Provide Input to Industry on High Priority Use Cases

1. Background to Post-Summit Activities and Work of Expanded Core Work Group

At the closing session of the Summit, attendees reviewed all of the previous discussions during that day and the three recommendations that emerged from the afternoon breakout session. The participants then answered two basic questions:

- What are the next steps towards achieving the Summit’s objectives of interoperability?
- Would your firm/agency support working cooperatively with other Summit attendees in taking those steps and working towards achieving those objectives?

The participants listed the following items as the NEXT STEPS and expressed a consensus that the attendees would work with the Alliance towards carrying them out:

- a. Broaden Stakeholder Awareness and Participation (Buy-in)
- b. Expand the Alliance’s Advisory Group with Participants from the Summit
 - 1) Form a vendors interface group that can work with the Alliance’s Expanded Core Work Group.
 - 2) Expand the Alliance’s Core Work Group to include a wider diversity (size & geographic) of jurisdictions to identify high priority use cases and data exchange needs, identify other project priority needs, provide input on gaps in existing software now available to jurisdictions and expand work process models.
- c. Seek and Obtain Funding to Carry out the Objectives

In the remainder of this report, the Alliance focuses on the work conducted since the conclusion of the Summit by the Expanded Core Work Group and shares with the software/hardware industry, for their review and comment, the Expanded Core Work Group’s work products.

2. Expanded Core Work Group – Role, Composition & Work Products for Software Community Review

- **Role:** The New York City Summit identified the need to expand the size of the Alliance’s Core Work Group to include a wider range of different size jurisdictions to undertake the following tasks:
 - a. Identify what are the high priority use cases and data exchange needs to support state/local government interoperability statement.

- b. Provide the building regulators perspective of the definition and characteristics and capabilities of currently available commercial software and gaps in current approaches.
 - c. Look at and comment on limitations and technologies that require further investigation and resolution.
- **Composition:** The core work group was expanded to include all of the following jurisdictions: New York City, NY; Los Angeles, CA; Ventura County, CA; Fairfax County, VA; Bellevue, WA; Norfolk, VA; San Jose, CA; Sunnyvale, CA; Santa Clara, CA; Indianapolis, IN; Columbus, OH; Mecklenburg County, NC; states of California, New Jersey, New York, Oregon and Virginia; and National Association of State Chief Information Officers

3. Work Products for Industry Review/Comment

The Expanded Core Work Group produced the following requested products for the software/hardware industry's review and comment:

- a. High Prioritized Use Cases – Follow-up Action from the Summit – Development by Jurisdictions of a Listing of High Priority Use Cases – User Functionality Priorities - **See Attachment B**
- b. Identification of Gaps – **See Attachment C**
 “Alliance Report on Characteristics and Capabilities of Currently Available Commercial Software and Gaps in Current Approaches, Implementations and Technologies”
- c. Additional Regulatory Processes for Alliance consideration:
 - 1) Document management
 - 2) Property Use and Zoning
 (Reviewing existing process maps to assure that Appeals and Variances are covered)
- d. Interoperability Background Study - A Look at other Interoperability Efforts and Their Relevance to the Building Regulatory Process – **See Attachment D**
- e. Support Materials – Building Regulatory Process Maps P-1 through P-9 (from Summit) – **See Attachment E**

E. Comments Requested by the Alliance from the Software/Hardware Industry Representatives who did not attend the September Summit

As noted in the opening of this report, to fulfill the Action Items agreed to at the Summit, the Alliance has transmitted all of the above work products to the Summit attendees from the hardware and software industry for review and comment. Following their review, modifications were made to the work materials in preparation for submission to representatives from the IT industry who did not attend the Summit to gain your input and encourage your involvement in this project.

Your comments may be submitted by email, phone, fax (703 481-3596) and through your participation on an Alliance Conference Call that will be held Monday, March 29, at 3:00 pm Eastern Standard Time. The access number for that call is contained in the transmittal email of this report.

The Alliance at this time is specifically seeking your input on the following:

From your firm's perspective, please comment on the content and usefulness to your firm of the following:

- 1) Expanded Core Work Group's Listing of High Priority Use Cases & User Functionality Priorities (Attachment B). Do these ten detailed use cases provide your firm with information useful in your generating interoperable software for the building regulatory process?
- 2) Review and Comment on any gaps that you as a software/hardware vendor believe exist in software/hardware systems currently available to government (Attachment C). Are the ones shown in Attachment C accurate? Are there other gaps? Does this offer any recommendations for next actions by the Alliance?
- 3) Interoperability Background Study (Attachment D). Does this study offer any useful actions? If so, what are they?

Please also provide the Alliance your comments on the following:

- 1) Provide input on actions state and local governments need to take in their procurements to facilitate development of interoperable software/hardware.
- 2) Provide recommendations on implementations and technologies that require further investigation and resolution by Alliance or others.
- 3) Offer further comments on Draft Interoperability Statement that emerged from NY City Summit. **See Attachment F** – Interoperability Statement that emerged from the Summit

- 4) If your firm can do so, share with the Alliance your data requirements for the permitting and other building regulatory processes as a step towards interoperability.

F. Next Steps in Alliance Project

As noted earlier in this paper, following receipt of your comments, the Alliance's next steps are:

1. Input from software/hardware firms will be incorporated into a final document that will be forwarded to the Alliance's Technology Task Force for review at a meeting on March 30 and circulated to software vendors/government regulators to develop consensus on data requirements, leading to definition of common format for software used in building regulatory process and final interoperability statement for inclusion in Alliance Model Procurement Guidelines.
2. The Alliance's Model Procurement Guidelines will be revised to incorporate an interoperability statement and will be posted to Alliance website and distributed to state/local governments.
3. The Alliance will work together with jurisdictions, construction industry, software/hardware/IT community to identify future work that must be done to create additional technologies and requirements to further advance the development and implementation of a state-of-the-art integrated and interoperable building regulatory and construction system. This may include a second summit meeting some time during the summer of 2004.

G. Closing Comments

The Alliance wishes to thank you for taking time to review and comment on the accompanying work products from the Expanded Core Work Group.

Your input at this juncture will help the Alliance both improve its understanding of the software industry and the quality of the accompanying work materials and will also set the stage for the software, construction and building regulatory communities to take the next steps to speed the development and use of interoperable hardware and software in the nation's building regulatory process.

Should you have any questions or wish to submit your comments on this report prior to the March 29 conference call or March 30 Technology Task Force meeting, please do not hesitate to contact the Alliance Secretary, Robert Wible, but email at rwible@ncsbcs.org or by phone 800 362-2633 ext. 235.

Lastly, the Alliance wishes to thank the Expanded Core Work Group, software industry attendees at the September 24 Summit, and NIST for the support for the preparation of the post-Summit work materials provided in this report.