

# The Joy of Developing a Web-based Survey System!

Stuart Allen, Brandon Peele, Chris Rasmussen,  
Sridevi Sattaluri, R. Suresh, Emily Warmoth

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*RTI International is a trade name of Research Triangle Institute*

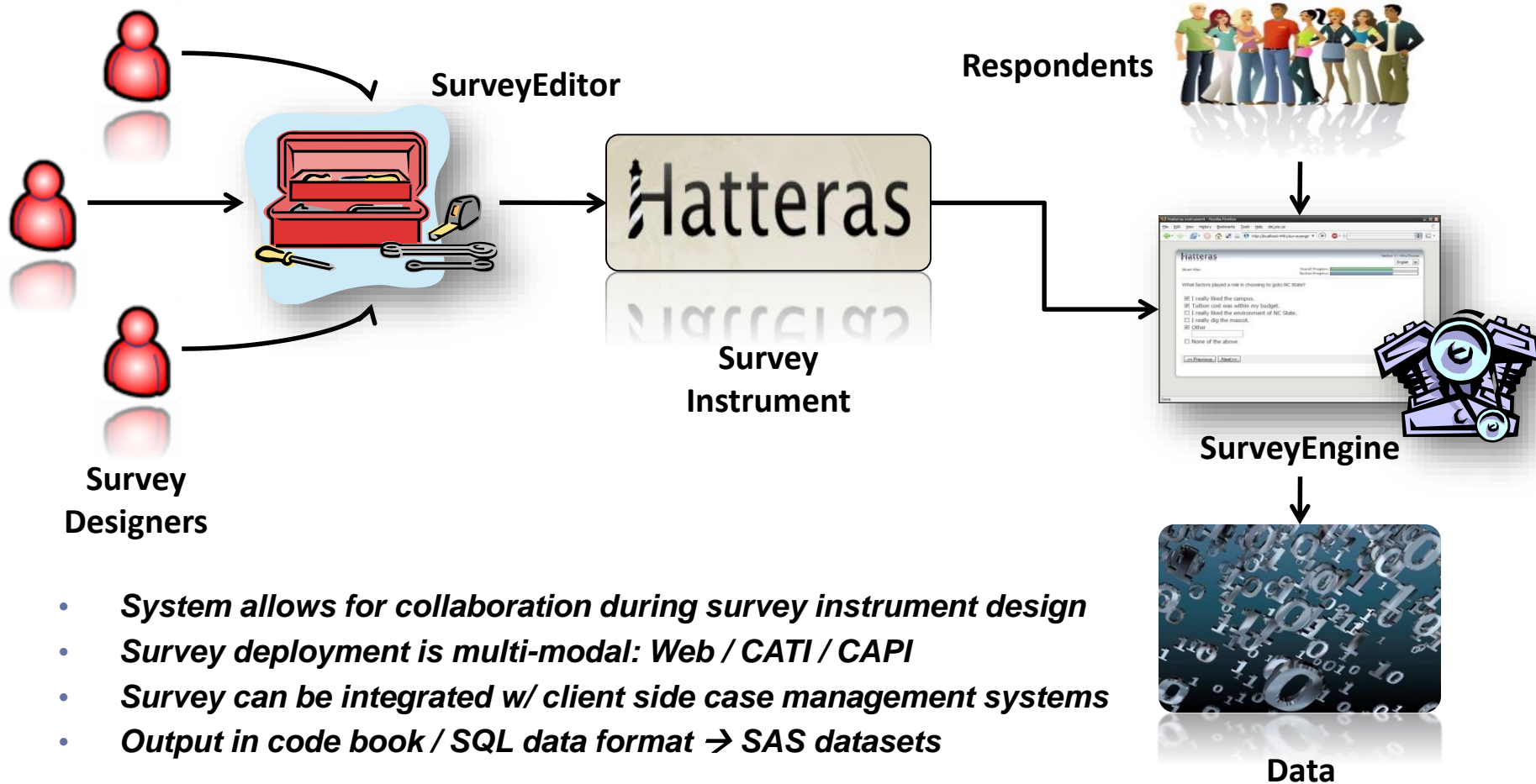
# What is Hatteras?

- A standard development platform for surveys, initially developed for web-based surveys
- A platform shared by specification writers and programmers for instrument design and documentation
- A web based rendering engine based on common core libraries

# Hatteras System Overview

- Hatteras = SurveyEditor + SurveyEngine + Utilities
- SurveyEditor
  - Edit instrument specs
  - Collaborate with team on specifications
  - Documentation utilities
- SurveyEngine
  - Website that runs the instrument
  - Based on Hatteras Core library
  - Testing utilities
- Utilities
  - Codebook generator
  - Blaise code generator

# Hatteras System Overview



# Challenge: Questionnaire Specification

*Questionnaire development environment changes every time a new CAI software is introduced!*

- Same editor (or IDE) is used by all users
  - Comments system facilitates collaborative development
- Same editor used for different modes and software (web, Blaise, data-entry)
- Specs can be provided in MS Word or Excel for block import into the system as a starting point
- Whole instrument can be copied over as a “template” especially for longitudinal studies using XML

# Hatteras Dashboard



**My Studies** [-] My Comments **Instruments**

Study: NPS.

NPS	Field Test	
<b>Editing</b> Drill-down Batch Editor Item Option Editor Instructions Editor Globals Editor	<b>Tools</b> Print Specs Comments Search Label List Code Book IDADS Docs <i>Test Link</i> <i>Prod Link</i>	<b>Admin</b> Sync Settings Import XML General Help Check-in Forms Languages

NPS	Full Scale	
<b>Editing</b> Drill-down Batch Editor Item Option Editor Instructions Editor Globals Editor	<b>Tools</b> Print Specs Comments Search Label List Code Book IDADS Docs Test Link Prod Link	<b>Admin</b> Sync Settings Import XML General Help Check-in Forms Languages

**My Studies** list:

- Hatteras Demo
- Stu testing study
- NPI
- NPS
- General Survey Systems Initiative

# Hatteras Survey Editor

**Instrument structure: Sections, Forms, Questions, Items, and Options**

**Multi-language tabbed interface**  
(when instrument is setup for multi-lang)

**Active Menu: Question wording**

**Active Tab: Form (Address)**

**Menu options (Form tab)**

**Properties for currently selected element (Address Form)**

**Form Properties**

Form Name	Address
TIO Probe	None
Custom	<input type="checkbox"/>
Active	<input checked="" type="checkbox"/>
Iteration Group	
Iteration Type	None

★ Test Form Save

# XML Tagging for Block Import

The screenshot displays an XML editor with a document containing XML tags for a survey question and its options. The XML structure is as follows:

```
<question name="CL_3">  
  <prelogic>IF CL_2=1, ASK CL_3</prelogic>  
  <wording>Where are you moving?</wording>  
  <option itemname="CL_3_STREET" itemtype="TEXT" itemwording="Street:">  
    <wording>Do you plan to move in the next 6 mont</wording>  
    <option 1 = YES</option>  
    <option 2 = NO</option>  
  </option>  
  <option itemname="CL_3_CITY" itemtype="TEXT" itemwording="City:">  
  </option>  
</question>
```

The XML Structure panel on the right shows the document's hierarchy:

- option
  - question
    - name
    - prelogic
    - wording
    - item
      - itemname
      - itemtype
      - itemwording
    - item

Options in the XML Structure panel:

- Show XML tags in the document
- Choose an element to apply to your current selection:
  - item
  - itemname
- List only child elements of current element
- [XML Options...](#)



# Challenge: Questionnaire Design

*Web-based software tend not to support all question types and/or complex logic that are standard in client-based software*

Features include:

- Standard question types as well as types such as conditional display for 'specify other'
- Conditional display of question text
- C# language to specify skip logic and validation logic
- Looping through sets of questions
- Automatic flagging of backed-over items
- Look and feel for study specific "skin" can be customized easily
- Can add custom forms for unique scenarios
- Support for multiple languages

# Hatteras Survey Engine

## NPSAS

National Postsecondary Student Aid Study

OMB Clearance No.: 1850-0666 Exp. Date: 01/31/2010

John Public\_stu

Education Experiences / N8MATHHT



Overall Progress: 

Section Progress: 

Which of the following math courses did you complete while in high school?

	Yes	No
Algebra II	<input type="radio"/>	<input checked="" type="radio"/>
Algebra III or Trigonometry	<input type="radio"/>	<input type="radio"/>
Pre-calculus or analytic geometry	<input type="radio"/>	<input type="radio"/>
Calculus	<input type="radio"/>	<input type="radio"/>
Statistics	<input type="radio"/>	<input type="radio"/>



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# Hatteras Survey Engine With Keyboard Entry

**Hatteras** SectionF / F10

Overall Progress:    
Section Progress: 

10. Is this student's reading level...

- 1** On grade
- 2** Below grade
- 3** Above grade
- 99** Don't know

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# Challenge: Mixed-Mode Studies

*Spec it once, use it in different ways and oh yeah, make it compatible with other infrastructure systems*

- Same Hatteras instrument can be set up for data collection in different modes: Self Interview, CATI, CAPI, or Data Entry
- Works seamlessly with RTI's CATI-CMS and IFMS for CATI and CAPI studies respectively
- Response options can be varied for different modes
- Keyboard entry including function keys (for DK/RF) makes it easier for interviewers
- Double-Key verification is built-in for data entry

# Challenge: Non-linear Interviewing

*Administering questions in sequence is so 20<sup>th</sup> century!  
Need to be able to “jump-around” the instrument but still  
perform all of the validations*

- Hatteras instrument can be administered in a non-linear manner (code named: Kangaroo engine) for data abstraction purposes
- Validations are deferred and implemented at section level
- Keyboard entry is still available
- Same IDE is used to specify the questionnaire

# Challenge: Deployment

*Can we host the survey in Timbuktu but still allow CATI interviewers to follow up?*

- Develop the instruments in house but host them on the servers at client sites
- Synchronization tools facilitate updating of the instruments at client sites, FIPS-moderate environments and on CAPI laptops
- Version controlled common core library allows for new features to be added without affecting studies in production
- RTI's CATI-CMS can be used for follow up even if the study is hosted at client site or FIPS-moderate environments

# Challenge: Performance

*Everything is on the web fighting for bandwidth with Netflix but screen updates should match client-based software*

- Use AJAX technology to refresh only portion of the web page that changes
- Common core library improves performance
- Application level caching: Single but a full copy of instrument loaded in memory serves all users and helps reduce server load
- Use Smartclient technology for off-line interviewing

# Challenge: Data

*Data has to be available almost immediately with codebooks that are self-explanatory*

- Data can be extracted in unattended batch mode even from remote sites
- Built-in codebook generator includes question text, response options, and frequencies
- Paradata such as administration timing information are easily extractable
- Built-in modules facilitate generation of SAS datasets with all of the formats and labels



# Future Challenges

In the future, Hatteras will be able to:

- Generate code for Handheld devices
- Exploit features of smart phones
- Provide a much more user-friendly and feature rich data dissemination system

# That's all folks!

For additional information, please contact:

R. Suresh

Director, Center for Survey Technology

RTI International

919 541 6814

[suresh@rti.org](mailto:suresh@rti.org)

Thank you!