Research Program and Enterprise Architecture for Adaptive Survey Design At Census

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Adaptive Design Elements

• A tailored and dynamic approach to case management in data collection
• Uses auxiliary frame data, paradata and response data to guide contact approaches and resource allocation
• Employs a centralized system for controlling multiple data collection modes
Data Resources for Adaptive Design

• Frame data: e.g. type of structure, block group demographic statistics, alternative modes, (previous response data)

• Paradata: contact history (effort and response propensity), interviewer observations, time and travel, progress, Web survey metrics

• Response data: Current estimates for key variables

• **Quality metrics** -> sample balance, response rate, stability/quality of estimates
Tailored and Dynamic Case Management

• Prioritize cases (e.g. NSCG, 2013 Census Test)
• Prioritize modes (e.g. NSCG)
• Shift priorities with experience (e.g. NSCG, 2013 Census Test)
• Subsample open cases (e.g. Econ Census)
• Stop data collection (e.g. NHIS)
• Faster provision of data (e.g. NSCG)
What Does it Take to be Adaptive?

• An organizational mandate to “prove in” adaptive approaches to data collection
• An understanding of the elemental capabilities required
• An architectural approach
Organizational Mandate

Census Bureau Example

1. Established a Center with the primary responsibility for researching and implementing Adaptive Design for the enterprise
2. Staffed the new Center for Adaptive Design (CAD) with motivated representatives from each Directorate (Decennial, Demographic, Economic, Information Technology)
3. Inserted Adaptive Design goals in key strategic documents
4. Insisted that the CAD be a combined effort of Statistical Methodology and IT Enterprise Architecture
5. Robert Groves and John Thompson
Architectural Approach

• Work with Standards (common conceptual frameworks)

• Create a solution architecture

• Create a Program Roadmap
Challenges

• Accidental Architecture¹

Challenges

• This is what Accidental Architecture looks like at Census:
Single Platform to Manage Multiple Data Collection Modes

Sample & Response Processing

XML

Maestro

User Interface

Policy Automation – Business Rules Layer

Workflow Automation – BPM Layer

Integration & Access Services Layer

XML

Paper Mode Systems

Internet Mode System

Interview Operations Control (CATI, CAPI, TQA, Listing)

Sample

Response

XML

Workload Instrument for Modes

Responses From Modes

Status From Modes

XML
Augment Frame Data

Administrative Records

Sample & Response Processing

Maestro

User Interface

Policy Automation – Business Rules Layer

Workflow Automation – BPM Layer

Integration & Access Services Layer

Sample

Response

XML

Workload, Instrument

Response

Status

XML

Paper Mode Systems

Internet Mode System

Interview Operations Control (CATI, CAPI, TQA, Listing)

United States Census Bureau

U.S. Department of Commerce
Economics and Statistics Administration
U.S. CENSUS BUREAU
Adaptive Orchestration of Data Collection

- Administrative Records
- Sample & Response Processing
- Visualization, Modeling, Analysis, & Estimation
- Paradata

Maestro:
- User Interface
- Policy Automation – Business Rules Layer
- Workflow Automation – BPM Layer
- Integration & Access Services Layer

Systems:
- Paper Mode Systems
- Internet Mode System
- Interview Operations Control (CATI, CAPI, TQA, Listing)
Plan for Rolling Out Adaptive Design

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**Baseline 1:** Maestro Platform: Support ACS in 2016

**Baseline 2:** Maestro in place, add Paradata & Concurrent Analysis – Bring on **Decennial** and some Demo surveys in 2017

**Baseline 3:** Bring on more Demo surveys, start bringing on Econ surveys and Econ Census