Implications of Data Integrity & Security Standards for Managing Web Survey Fieldwork

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Overview

How authentication & access control practices interact with self-administered web survey fieldwork practices

1) Applicable information system security standards
2) Integrity of survey data: range of IS & survey practices
3) Balancing data integrity and fieldwork needs
4) Need to continuously re-examine evolving IS security and survey data collection practices

Relevance of Authentication & Access Control

Respondent	Researcher	Info System
• Confidentiality: Protection from disclosure and unauthorized access • Confidence in integrity of research	• Integrity: Protection from ineligible unit and cases • Control over reporter, authenticity of final submission	• Security: Attack prevention • System integrity, appropriate role-based access

IS Security Standards & Practices

- Objectives: confidentiality, integrity, and availability
- FISMA of 2002, implemented by:
  - Definitions in FIPS (“Federal Information Processing Standards”) 199 & 200
  - Controls in NIST Special Publication 800-53 (“Security and Privacy Controls for Federal Information Systems and Organizations”)

IS security standards & practices

- Approach: baselines for security controls for low-, moderate-, and high-impact information systems
- Selected access-related controls:
  - Account management
  - Access enforcement
  - Access control decisions
  - Permitted actions wo/ ID
  - Least Privilege
  - Bad logon attempts
  - Previous logon attempts
  - Session lock, termination

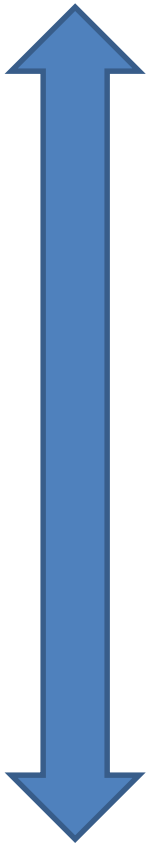
Example: Economic Census Industry Classification Report

- Mandatory, confidential, brief, no operating data - to determine NAICS code of company
- Respondent creates/signs in to account on Respondent Portal to access “my surveys”
- 12 digit Authentication Code to link respondent to one specific survey
  - One time use, for one reporter
  - Can’t always determine who used Code

Example: Economic Census Industry Classification Report

- Process for “sharing survey access” or delegation: request sendout of invitation email, recipient creates Portal account (no Authentication Code necessary)
  - Or: print and distribute questionnaire, facilitate aggregate data entry
  - Or (limited): spreadsheet download/upload (EDI)
- Mailed User ID and Password access for some not yet migrated to Authentication Code

Range of Web Survey Authentication & Access Control



- Open access to one URL
- Unique access code embedded in link to URL
- Static UserID and Password
- One-Time Password (e.g., additional PIN)
- Multi-Factor Identification (e.g., token)
- Digital certificate
- Identification device (card reader, biometrics)

Additional, Compensating Authentication & Access Controls

- Password strength and expiration options
- Security questions
- Identification/authorization of respondent device
- Challenge-and-response to prevent automated access attempts (e.g., “CAPTCHA”)

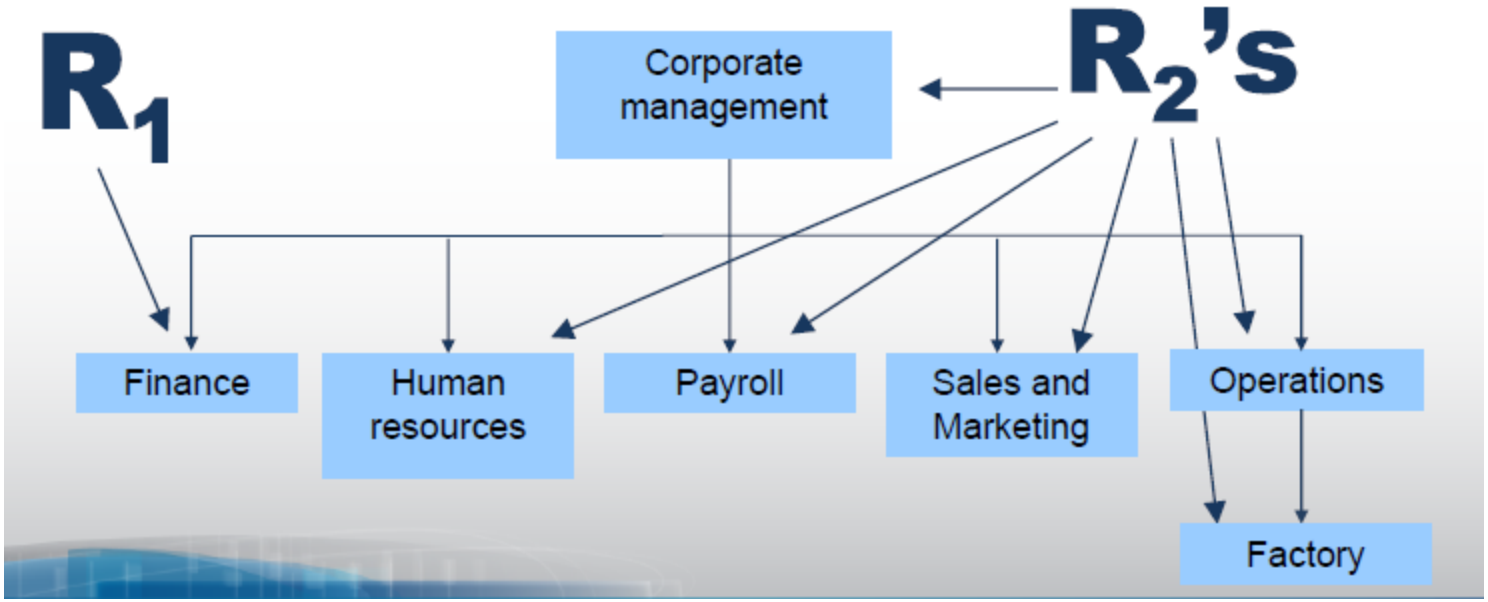
Web Survey Design for Integrity

(To Complement Authentication & Access Control)

- Instruct reporters on good access practices
- Reporter self-identification to determine role eligibility and enable validation follow-ups
- Review, certification and release by a specified authority
- Paradata, and response checks: legitimate respondent behavior?
- Time limitations decrease risk: response-related transactions, fieldwork period

Authentication & Access Control and Specific Fieldwork Activities

- High rate of substitute/multiple reporters in establishment (and some household) surveys



(Tuttle, 2016)

Authentication & Access Control and Specific Fieldwork Activities

- Limited workarounds in distributed response settings (e.g., enable facilitator/aggregator role with preview forms)
- Often impossible to identify, contact, and authorize only one eligible reporter for a unit
- Need “appropriate access” for help desk, case manager, and other research team agents interacting with reporters

Challenge of balancing security and response quality

- Human-computer interaction, usability, and cognitive research on survey burden:
  - Login effort may decrease participation and quality (Sedivi, Nichols, Kanarek, 2000)
  - But, manual login may not degrade response rate or quality over automated access (Heerwegh & Loosveldt, 2002)
- Working conclusion: burden matters, but security from disclosure or misrepresentation is increasingly important to respondents

Continuously Examine Authentication & Access Practices

- Adapt to new fieldwork methods, and enable good survey practices, while maintaining integrity aspect of information security
- But: “Do not remove security controls for operational convenience. Tailoring decisions regarding security controls should be defensible based on mission/business needs and accompanied by explicit risk-based determinations.” (NIST Special Pub 800-53)