

*turning knowledge into practice*

# **Strategies for Contacting Participants and Enhancing Data Quality: Lessons Learned from a Large Ongoing Web-Based Collection of Postsecondary Institution Data**

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# IPEDS

## Integrated Postsecondary Education Data System

- Conducted by the U.S. Department of Education's National Center for Education Statistics (NCES)
- 7 integrated surveys collected annually, during three collection periods:
  - Institutional Characteristics
  - Completions
  - Enrollment
  - Finance
  - Graduation Rates
  - Human Resources
  - Student Financial Aid

# IPEDS

## Integrated Postsecondary Education Data System

- Surveys are required for all postsecondary schools (colleges, universities, trade/vocational schools, etc) participating in federal financial aid (Title-IV) programs
- 7000 institutions, about 6700 of which are Title-IV

# IPEDS

## Integrated Postsecondary Education Data System

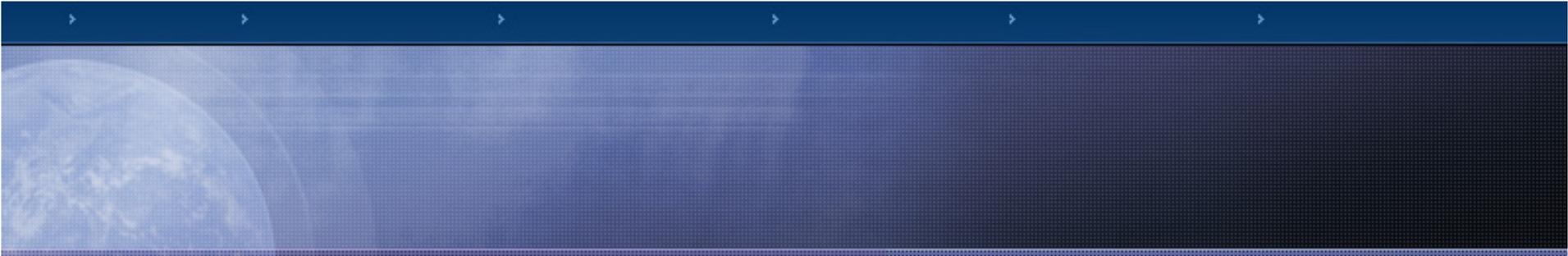
- IPEDS has been around for over 20 years
- The Web system was fully implemented in July 2000
- Secure system with password protection
- All institutions now submit data via the Web-based data collection system by:
  - keying the data into the system
  - uploading data files
- Users range from being very computer-savvy and experienced with IPEDS, to those who are new to the job and/or unfamiliar with the Web

# Key Issues Concerning Participants

- Web accessibility is required
- Ease of use needed for variety of types of users
- Must accommodate multiple users per school
- Automated quality checks on several types of data needed to facilitate submission of accurate data
- Technical support must be available to respondents

# Contacting Participant Institutions

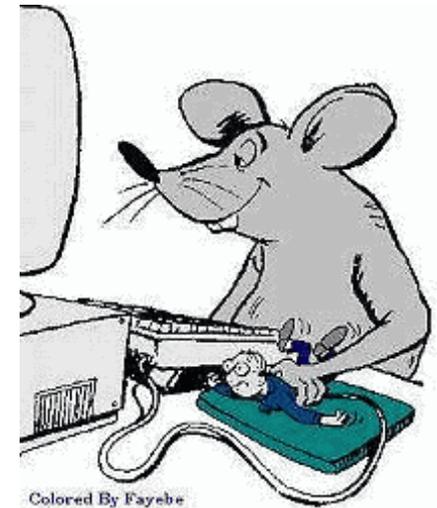
- Aggressive prompting schedule used to ensure:
  - Timely and accurate data submission
  - Adequate notification for purposes of compliance
  - Well documented history of multiple prompting attempts via multiple modes (email, telephone, and/or U.S. Mail)



# Communication Strategies

# Communication Strategies

- Email
  - Inbound questions & outbound responses
  - “Broadcast” reminder emails
  - “This Week in IPEDS” updates
- Telephone
  - Inbound questions & outbound responses
  - Prompting (reminder) calls to non-respondents
- U.S. Mail
  - Prompting (reminder) letters to Chief Executives



# Communicating via Email

- Email has served as our primary means of communicating with respondents.
  - Dependent upon respondents keeping their email address(es) updated. A significant number of users and email domain names change from year to year.
- When email is unsuccessful (or if success is not known), we use telephone, and (to a lesser degree) U.S. mail.
- Email is low-cost, but has other problems
  - Technology issues
  - Staff turnover issues
  - Unknown if email is successfully delivered.

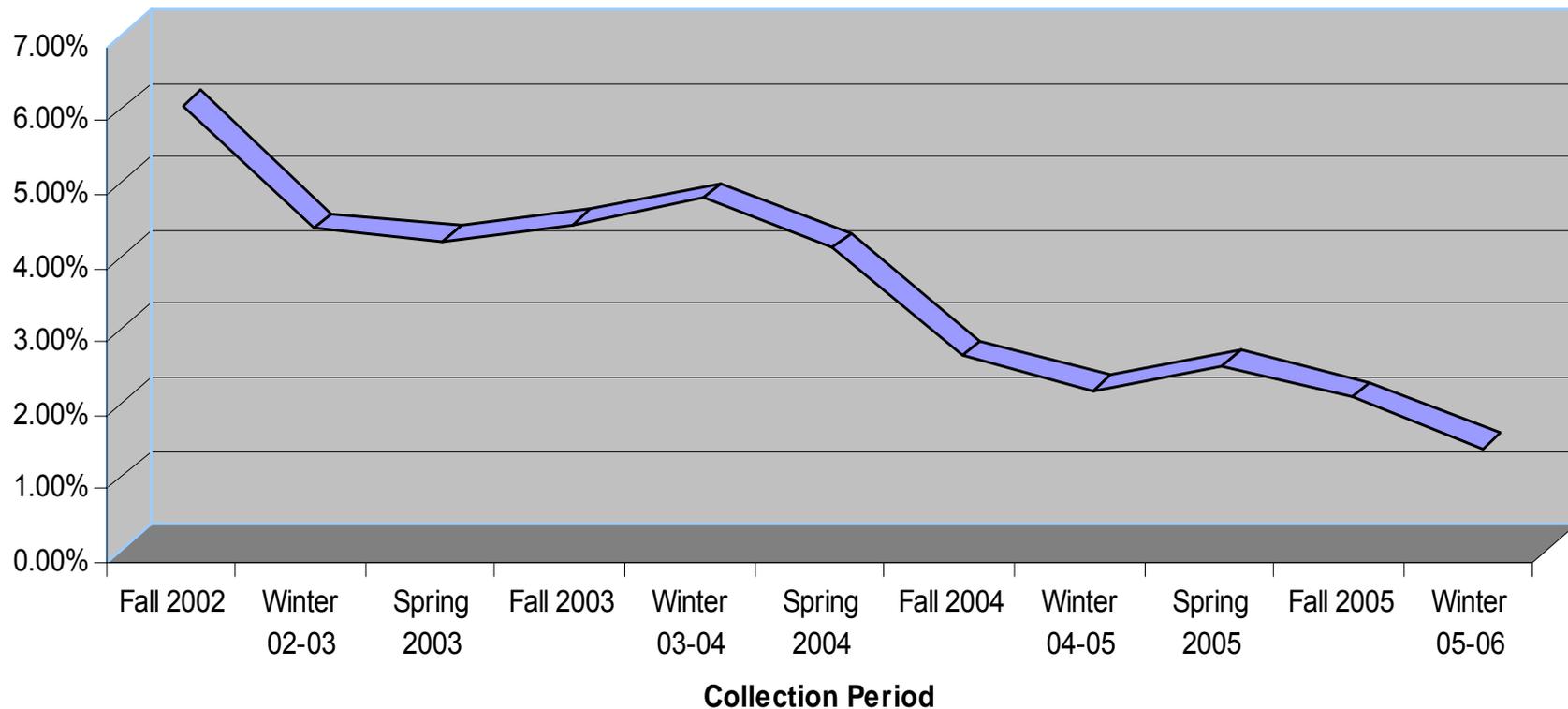
# Communicating via Email

## Non-Deliverable Emails

- Significant Changes in Internet Technology
  - Increase in SPAM filters— email is filtered out prior to receipt of email, and neither sender nor receiver is aware of this.
    - “Approved” senders lists used more extensively.
  - Fewer systems send automated delivery failure notices (e.g. “bounced email”).
    - If the domain is valid, but username doesn’t exist, email won’t be successfully delivered, yet it won’t “bounce” either.
- Thus, while the number of Non-Deliverable Emails may not be declining, fewer emails are being “bounced.”

# Communicating via Email

## “Bounced” Emails



# Communicating via Email

- Bounced emails, though fewer, still require follow-up.
  - “Email sweeper” – In-house tool used to track emails that bounce back and automatically assign for telephone follow-up.
    - Monitors bounced mail Outlook folder
    - Determines school and user with associated bounced address via Help Desk API
    - Creates incident ticket in Help Desk application for investigation and follow-up

# Communicating via Email

- Bounced emails (continued):
  - Although reasons for bounced emails vary, previous investigations that we have conducted revealed that over half of the email addresses were incorrect due to human error:
    - Mis-keyed email address
    - Domain name change was not updated
    - Staff changes were not updated

# Communicating via Email

## Summary

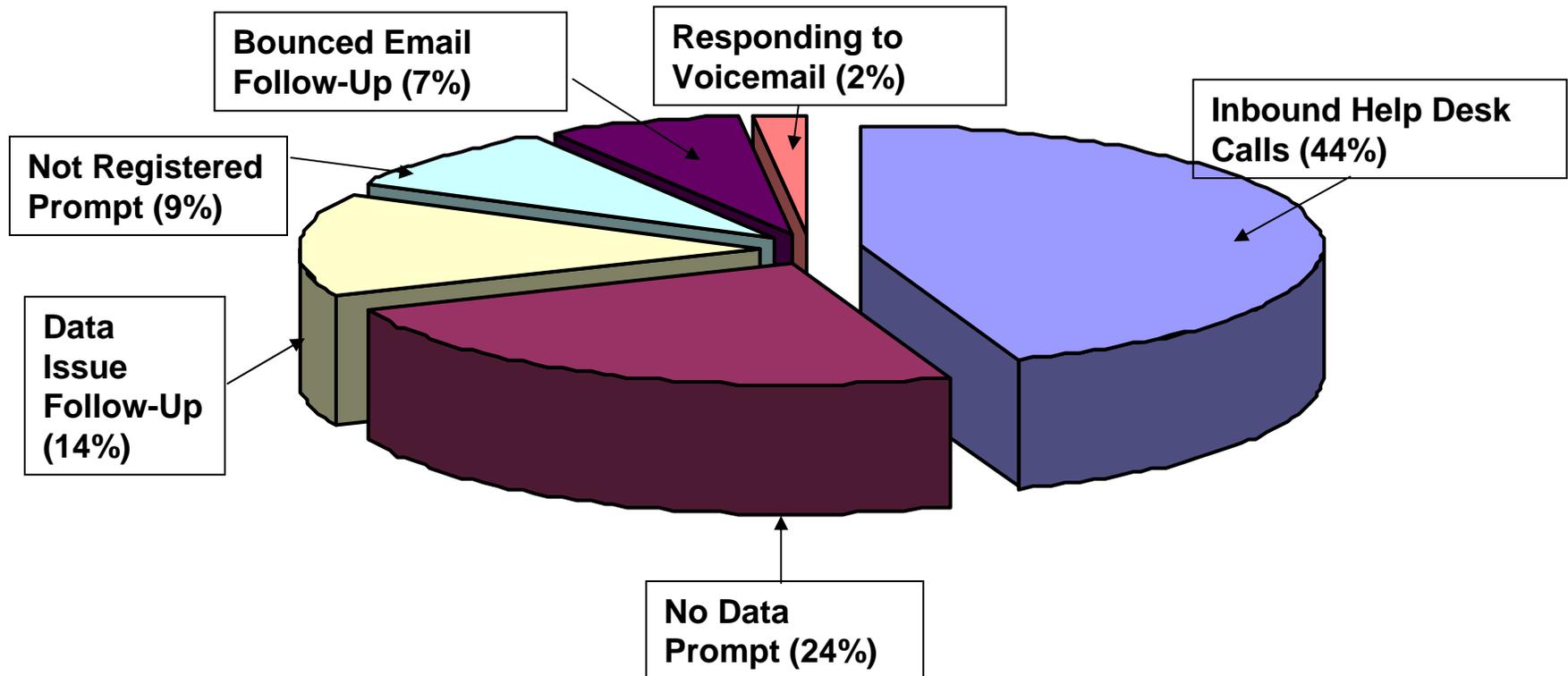
- IPEDS has effectively used Email as the primary means of communication. Highly cost effective relative to other modes.
  - Allows increased communication that wouldn't otherwise be possible
- We have identified problems and worked to overcome them.
  - Bounced Emails continue to be the most consistent and labor-intensive problem

# Communicating via Telephone

- Telephone is used as the primary means of communicating when:
  - Participants call the Help Desk.
  - We return messages left by voicemail.
  - Prompting participants that have not registered.
  - Prompting participants as deadline approaches and data entry has not been started.
  - Following-up on data quality issues and questions (post-submission).

# Communicating via Telephone

## Help Desk Call Activity by Type



# Communicating via Telephone

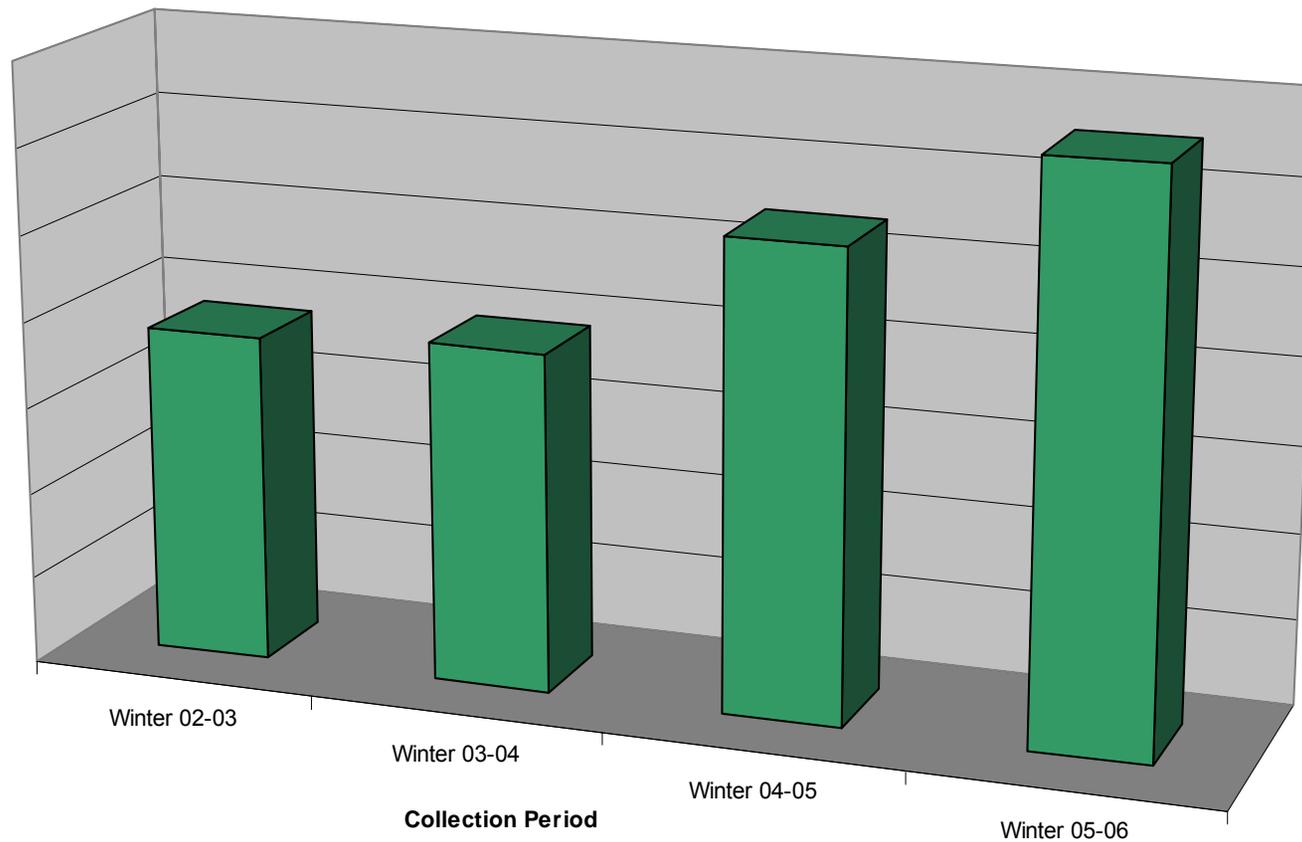
- Over the past several years, telephone communication has become increasingly important, especially as needed for conducting participant prompting. Why?
  - Participants become more familiar with web-collection system (i.e. complacency)
  - Increase in competing job demands
  - Decrease in job resources available
  - Complications arising from transition from legacy systems to more modern database structures/systems

# Communicating via Telephone

- Prompting Call Issues
  - Gatekeepers
  - Screening Devices (voicemail, CallerID, etc)
  - Respondents are very busy/inaccessible
- More prompting calls are required, and more attempts are needed to make successful contact with participants.

# Communicating via Telephone

## Outbound Prompting Calls – Relative Increase Over Time



# Communicating via Telephone

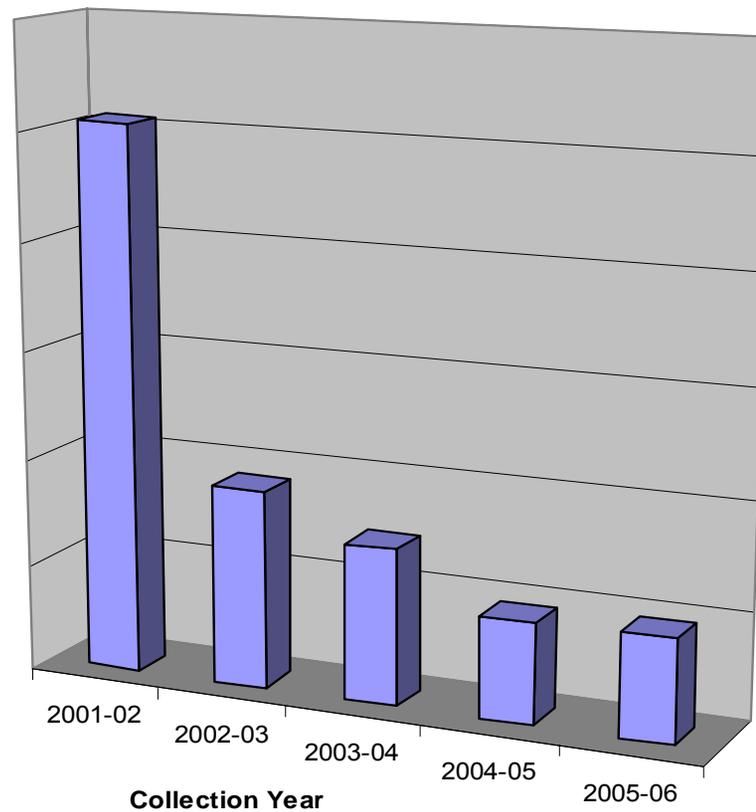
- Data-Submission Related Calls
  - Questions about inadequate edit explanations (e.g. “Data are correct” rather than an actual explanation).
  - Questions about caveats (e.g. explanatory comments that will be posted to the public websites).
  - Questions about obvious errors or inconsistencies in data.
- Frequently result in improvements to data (more on this later).

# Communicating via U.S. Mail

- U.S. Mail is used as the primary means of communicating when:
  - The contact person at the participant institution is not known (letter is sent to Chief Executive or to general school address).
  - The contact person at the school has not registered (letter is sent to Chief Executive).

# Communicating via U.S. Mail

## Outbound U.S. Mail – Relative Decrease Over Time



# Summary of Communication Strategies

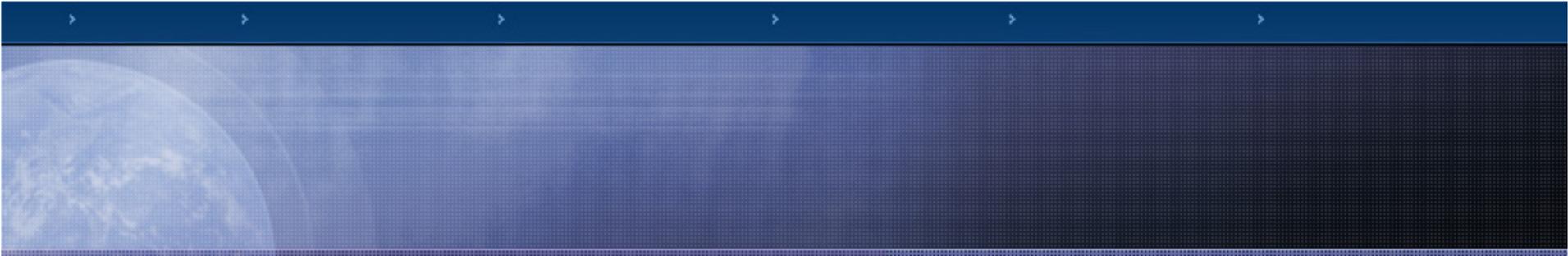
- Email is used as primary means of communication
  - Advantages:
    - Low Cost, Minimal Resources, Fast
    - Effective for most participating institutions
    - Communications are easily and quickly documented
  - Disadvantages:
    - Not all emails will successfully reach recipients
    - Dependent upon users updating emails addresses
    - Competes with SPAM for attention of recipient
    - Technology changes may outpace user knowledge

# Summary of Communication Strategies

- Telephone is used as secondary means of communication
  - Advantages:
    - Relatively effective. The vast majority of institutions have voicemail or live people who can take a message.
  - Disadvantages:
    - Often difficult to speak to the desired person due to scheduling/time constraints, and/or time zone issues.
    - Relatively expensive, highly dependent upon resources.
    - More time consuming to document.

# Summary of Communication Strategies

- U.S. Mail is used as “last resort”
  - Advantages
    - Relatively inexpensive
    - Relatively effective (e.g. delivery is usually successful)
  - Disadvantages
    - Indeterminate as to successful delivery (e.g. may be difficult to document successful receipt of letters)
    - Relatively slow



# Data Capture & Data Quality

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# Data Capture & Data Quality

- Web-based Data Collection System
  - Benefits
    - Multiple users can enter data (simultaneously or sequentially)
    - Respondents can enter data in multiple sessions
    - Data can be imported (and/or exported) using “.txt” files
    - Data are secure and subjected to procedures for ensuring confidentiality of individually-identifiable information

# Data Capture & Data Quality

- Web-based Data Collection System
  - On-Line Editing
    - Field edits ensure appropriate data (i.e. alpha vs. numeric)
    - Screen edits ensure that critical fields are completed
    - Global edits
      - Compares values across sections for consistency
      - Compares current year values to prior year values for consistency
      - Programmable rules (e.g. thresholds)

# Data Capture & Data Quality

- Web-based Data Collection System
  - On-Line Editing
    - Edit Rules are dynamically editable within collection system.
    - Help Desk can review rules to ensure that they are correctly established, and problems with edit rules can thus be easily located and resolved.
  - Real Time Reports
    - Allow data collection managers to assess progress.
  - User Activity Log
    - Allows tracking of changes made by users at all levels.

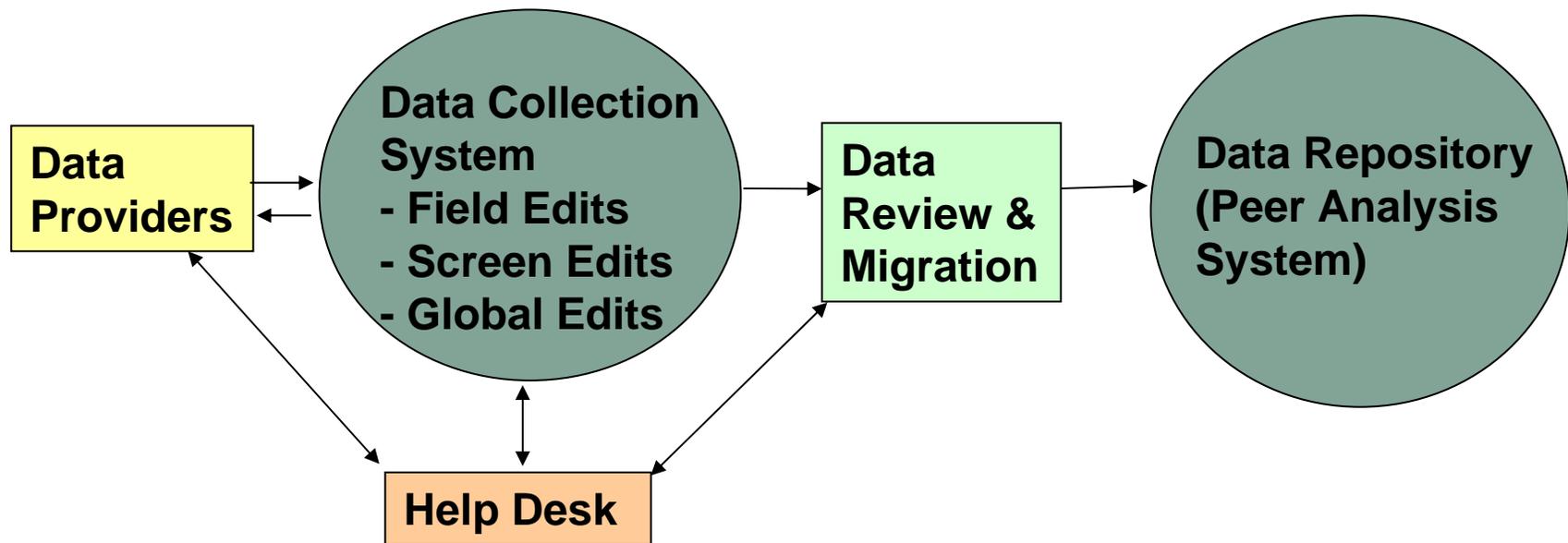
# Data Capture & Data Quality

- Web-based Collection System
  - Data collection (self-administered web surveys) are enabled and disabled as set by date parameters within web system.
  - As surveys are completed during each collection period, cases are queued for data review prior to final disposition.
  - As needed, surveys can be “un-locked” for correcting by the data providers or by the Help Desk.

# Data Capture & Data Quality

- Manual Review by Help Desk Staff
  - Following completion of on-line editing and submission of completed survey data.
  - Critical fields are reviewed, especially those that cannot be edited automatically.
  - If problems are located, additional reviews can be run against completed data to determine if other institutions submitted data with those problems.
  - Data that pass muster are migrated from the collection server to another database server.
- We call this “Data Migration”

# Data Capture & Data Quality



# Data Capture & Data Quality

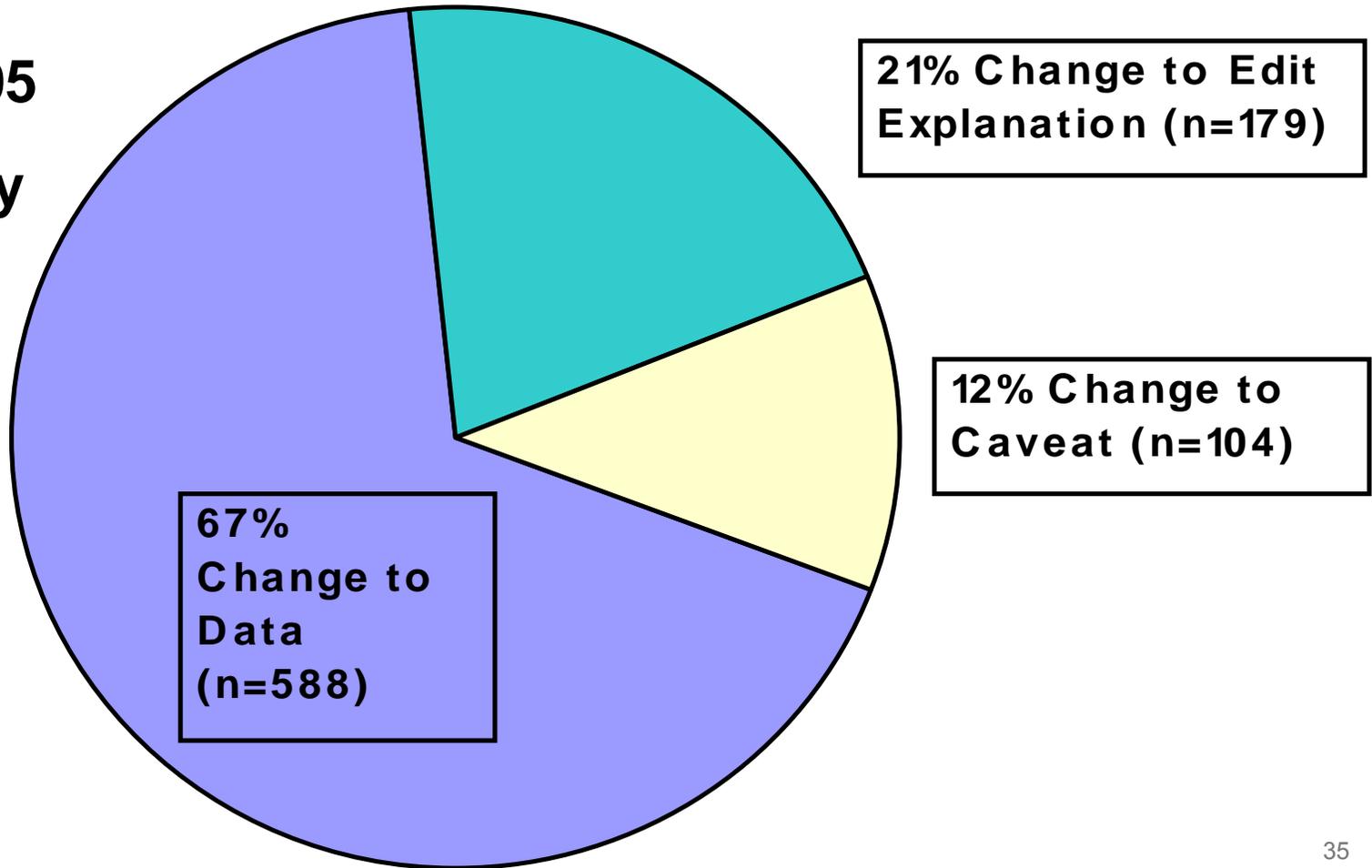
- Data Migration Review by Help Desk Staff
  - Although time consuming, this review has several benefits:
    - Significant improvements to final dataset
    - Improves consistency across respondents (e.g. through educating users as to appropriate definitions, methods for aggregating data, etc)
    - Increases respondent accountability
    - Ensures that consumer data available to public (e.g. College Opportunities On-Line (COOL) website) are as accurate as possible

# Data Capture & Data Quality

- Case Study:
  - Reviewed contact logs for 2700+ instances of respondents being contacted for data follow-up issues following the Spring 2005 collection.
  - Contacts were coded to determine if changes were made to: 1) data values, 2) text caveats, and 3) edit explanations.
  - Results were as follows:

# Data Capture & Data Quality

**Spring 2005  
Case Study**



# Data Capture & Data Quality

- Capturing Help Desk Activity
  - A separate web-based system (Help Desk Application) is used to store records of all contacts made to institutions. This system was developed in-house.
  - The system performs the following tasks:
    - Assigns prompting calls
    - Generates broadcast emails
    - Manages cases for data review purposes
    - Manages reminders/appointments
    - Facilitates communication among Help Desk staff
    - Samples contact histories for purposes of Quality Control

# Capturing Help Desk Activity

## Help Desk Application Contact Activity Reports

The screenshot shows the HD IPEDS Help Desk Application interface. At the top, there is a navigation menu with options: Logout, Admin, Search, Migration, Reports, Contacts, Appts., History, Forum, Bulletins, HDA IM, and Print. Below the navigation menu, the user's name "Eric Graham" is displayed. The main content area shows a table of contact activity reports for "Jamie Isaac".

Date/Time	Incident type	Priority	Iped ID	School Name	Contact Name	Description
8/13/2004 10:05:36 AM	General IPEDS	Normal	<a href="#">440475</a>	PIERRES SCHOOL OF COSMETOLOGY	spoketo	See incident under 161493 of 8/9/04: Double checked info and 440475 should also be under the parent 161493. Called back to let Kelly know all 4 branches will be under the Portland main location. PS Jamie sent email to Jan on 8/9 asking her to update this.
9/20/2004 3:57:49 PM	Specific: Inst. Char. Survey	Normal	<a href="#">145354</a>	GRAHAM HOSPITAL SCHOOL OF NURSING	spoketo	KH's school is a small Nursing school who only had 1 student who was a woman,,,,,contacted Matt to help with override in Part C selection process,,,Matt will contact when work is complete
9/30/2004 4:14:39 PM	Bad Email	Normal	<a href="#">133261</a>	SUMMIT INSTITUTE	spoketo	Called number provided on registration page, called DIR ASSISTANCE, and accessed the institution web page, the web page expired on Spt 24, 04. Not sure what to do w/ this incident, assigned to admin Jamie I. /cs
3/10/2006 3:51:45 PM	General IPEDS	Normal	<a href="#">145354</a>	GRAHAM HOSPITAL SCHOOL OF NURSING	spoketo	The data provider is new to the school and requested copies of prior year reports. He was directed to the appropriate archive locations.
3/10/2006 3:53:21 PM	General IPEDS	Normal	<a href="#">145354</a>	GRAHAM HOSPITAL SCHOOL OF NURSING	spoketo	Mr. User was not available as he is presently out of town. I left a message with receptionist, Sallie Mae, reminding him that the deadline for this collection is March 20, 2006.
3/10/2006 3:56:23 PM	Specific: Staff Survey	Normal	<a href="#">440475</a>	PIERRES SCHOOL OF COSMETOLOGY	spoketo	A fax received containing the missing data elements. Data were entered and edits were successfully performed. Contact has been sent an email confirming receipt of fax and completion of remaining survey items. Supervisor has been contacted and fax log updated accordingly.
9/15/2003 3:33:31 PM	Specific: Enrollment Survey	Low	<a href="#">119173</a>	MOUNT ST MARY'S COLLEGE	spoketo	They don't have graduate programs at this campus, but do have graduate courses. Will need those screens for the EF in winter/spring.

At the bottom of the interface, the user's name "Jeff Rawlings" is visible, along with a "Done" button and a "Local intranet" status indicator.

# Capturing Help Desk Activity

- Specifics of Help Desk Tools:
  - Email logger:
    - .NET program run as a batch process overnight
    - Exchange library integration for email/Public Folder access
    - Help Desk API for lookup and incident creation
  - HelpDesk Prompt Processor
    - Automatic creation of incidents for followup
    - Easy interface for user, list of UnitIDs and prompt text only items required

# Capturing Help Desk Activity

- Specifics of Help Desk Tools:
- Help Desk Data Migration tools
  - Administrator assigns schools to Help Desk staff
  - Help Desk staff check Migration page (queue) for current survey status for their assigned schools
  - Users have real-time view of survey status and can manage cases for review quickly and easily
  - Overall migration significantly faster and more efficient

# Capturing Help Desk Activity

## Data Migration Case Management

**HD IPEDS HELP DESK APPLICATION**  
ONLINE HELP ?

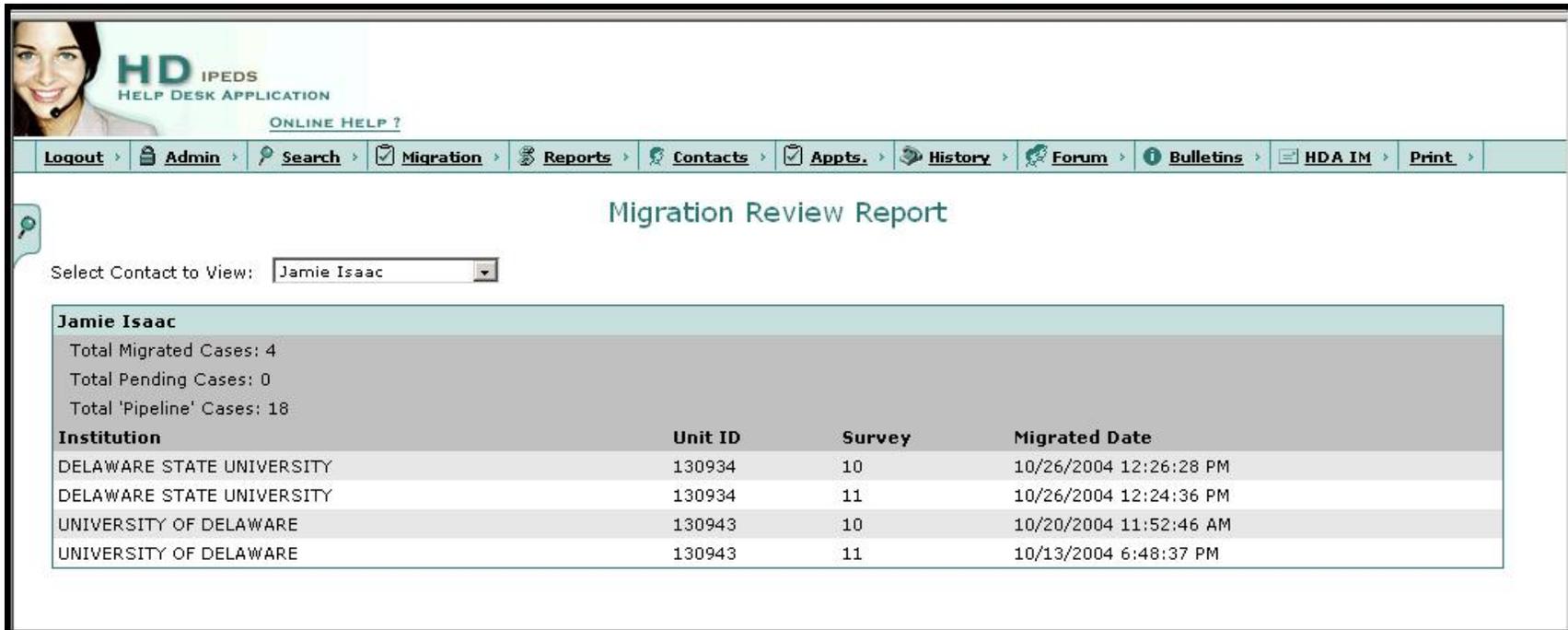
Logout > Admin > Search > Migration > Reports > Contacts > Appts. > History > Forum > Bulletins > HDA IM > Print >

Data Migration Review   Sort: [UnitID](#) [State](#) [Name](#) Jeff M

UnitID	State	Institution Name	Survey	Status	Last User
103954	AZ	ARIZONA ACADEMY OF BEAUTY INC	Completions	Start	P41039541
			Institutional Characteristics	Start	P41039541
104346	AZ	CENTRAL ARIZONA COLLEGE	Institutional Characteristics	Start	04A0011
104531	AZ	DEVRY UNIVERSITY-ARIZONA	Completions	Start	04A0011
			Institutional Characteristics	Start	04A0011
262235	AZ	ARIZONA ACADEMY OF BEAUTY-NORTH	Completions	Start	P42622351
			Institutional Characteristics	Start	P42622351
420574	AZ	ARIZONA STATE UNIVERSITY EAST	Completions	Start	04A0011
			Institutional Characteristics	Start	04A0011

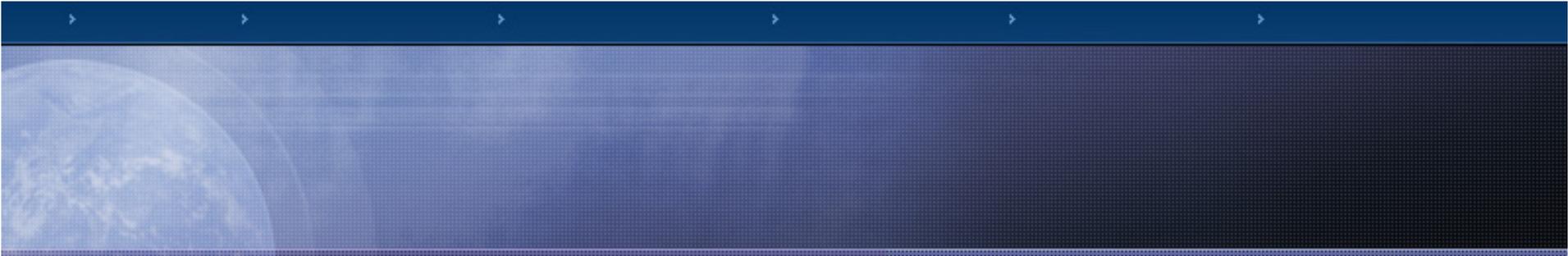
# Capturing Help Desk Activity

## Data Migration Case Management



The screenshot displays the 'Migration Review Report' for 'Jamie Isaac' within the 'HD IPEDS HELP DESK APPLICATION'. The interface includes a navigation menu with options like Logout, Admin, Search, Migration, Reports, Contacts, Appts., History, Forum, Bulletins, HDA IM, and Print. The report shows summary statistics for Jamie Isaac: 4 Total Migrated Cases, 0 Total Pending Cases, and 18 Total 'Pipeline' Cases. Below this is a table with columns for Institution, Unit ID, Survey, and Migrated Date.

Institution	Unit ID	Survey	Migrated Date
DELAWARE STATE UNIVERSITY	130934	10	10/26/2004 12:26:28 PM
DELAWARE STATE UNIVERSITY	130934	11	10/26/2004 12:24:36 PM
UNIVERSITY OF DELAWARE	130943	10	10/20/2004 11:52:46 AM
UNIVERSITY OF DELAWARE	130943	11	10/13/2004 6:48:37 PM



# Summary & Conclusions

# Summary & Conclusions

- **Contacting strategies**
  - Even for a mandated study with clear non-compliance ramifications, communicating with respondents poses challenges
  - Multiple contacting approaches can maximize effectiveness while minimizing costs
  - Patterns of response can greatly affect communication strategies, especially strategies dependent upon telephone communication
  - Use of strategies has evolved over time, as changes in technology, and in participant response patterns, have evolved

# Summary & Conclusions

- **Data capture and data quality**
  - Automated edit checks greatly improve data quality, but imposes extra burden on respondents
  - Adding additional levels of review (prior to any data cleaning/data imputation steps) can lead to significant improvements in data quality
  - Multiple data quality assurance procedures should be employed to target varying types of problems (and types of respondents)

# Contact Information

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**Slides available at: [www.rti.org/fedcasic](http://www.rti.org/fedcasic)**