The Evolution of Password Requirements in the Consumer Expenditure Diary Survey
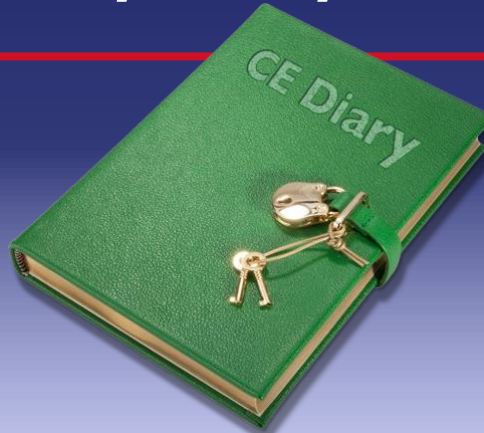
Brandon Kopp

FESAC 2015
June 12th, 2015

BLS
BUREAU OF LABOR STATISTICS
U.S. DEPARTMENT OF LABOR
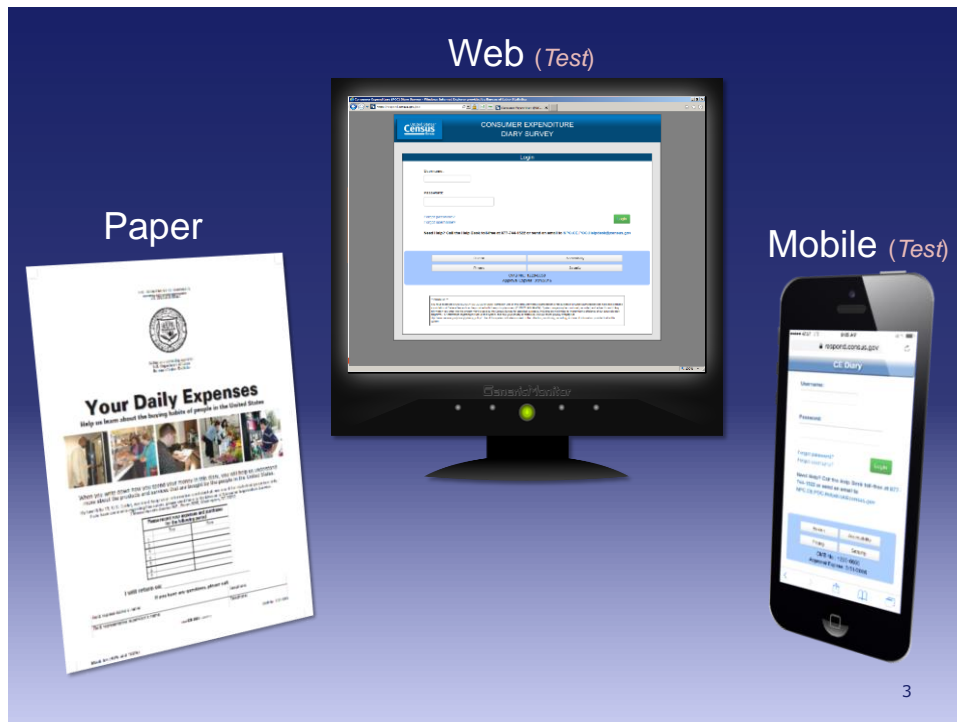
This presentation does not reflect BLS Policy

www.bls.gov

The Consumer Expenditure Diary Survey (CED)

- Currently, BLS's only self-administered household survey
- Respondents are asked to enter all of their expenses in as close to real-time as possible
- Respondents complete two, 1-week diaries

2

Web (*Test*)

Paper

Mobile (*Test*)

3

As a Web Survey
The CE Diary is Unique

- Respondents access the diary multiple times throughout the diary period
  - ▶ Respondents may be more likely to invest time in learning the instrument (e.g., training materials)
  - ▶ Usability problems are multiplied across repeated experiences
- Because respondents return to the survey multiple times and need access to data they've already entered, a login process is required

BLS

4

As a Password-Protected Website The CE Diary is Unique

- People volunteer their time and effort for limited personal benefit
- Credentials are only usable for 2 weeks
- Putting roadblocks in their way gives people a reason to say "No" or put in less effort

Discussion Topic

- How do we balance security and usability to ensure that web surveys live up to their promise of making survey response more convenient for respondents, while still keeping their data safe?

2

Diary Development Timeline

- 2017 — Gemini Large Scale Feasibility Test
- 2016 — Electronic Diary Development Contract
- Now — 2015 — Gemini Proof of Concept Test
  - New **Web** Instrument Developed
- 2014 — Individual Diaries Feasibility Test
- 2013 — First **Mobile** Instrument Developed
- 2012 — Web Diary Feasibility Test
- 2011 — Two New **Web** Instruments Developed at Census
- 2005 — Individual Diaries Field Test
- 2004 — Current **Paper** Diary First Used in Production
  - First **Web** Instrument Developed at BLS

BLS

7

Current Paper Diary (2005)

- The Paper Diary does not have any built-in security measures

BLS

First Web Version (2004)

- 21 participants were assigned 10-character account number and password
- They could change password

Bureau of Labor Statistics
Internet Data Collection Facility

ADA Statement | Privacy Policy | Logout

How Do I...?
Test Your Browser

Internet Data Collection Facility Logon

Account Number: [   ]
Password: [   ]

(password is case-sensitive   )

[Logon]

Forgot Password?

Please read:
Due to security reasons, your session will time out after 15 minutes of system inactivity. You will need to logon to the website again to continue.

9

Usability Recommendations
First Web Version (2004)

- "Criteria for creating a password are troublesome"
- "if password criteria are not absolutely required, remove them"
- "Make password & ID easier"

New Password: [   ]

Confirm Password: [   ]

Security Question:
Security Answer:

ATTENTION: Password Criteria
- Must be between 8 and 12 characters long
- Must contain 3 of these 4 following options
  - UPPERCASE ALPHA (A-Z)
  - Lowercase alpha (a-z)
  - Numeric (0-9)
  - Special Character !@#$^*-__=./:?[]\'{|} ~
- Passwords must match

Individual Diaries Field Test (2005)

- 38 participants in 20 households were given the choice of the Paper Diary and the new Web Diary
- Only 2 participants chose the Web Diary
- Several participants cited ease of use as a reason for choosing the Paper over the Web Diary.

U.S. Internet Users

Source: PewInternet.org
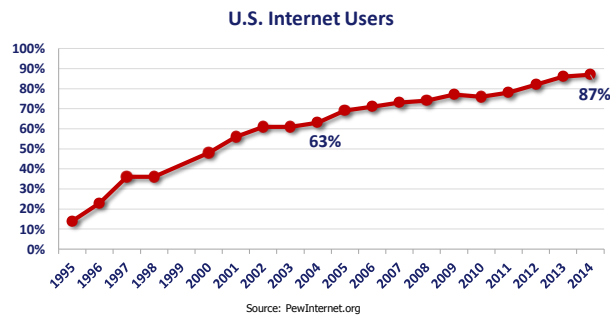
11

Second Web Version (2011)

- 42 participants were given an ID Number
- They entered the ID and received an email
- They then set a username and password

12

Usability Recommendations
Second Web Version (2011)

- 52% of participants failed to create a password on the first try
- 31% commented negatively about the account creation process
- "We recommend implementing a PIN login screen."

Passwords must contain a minimum of the following:
- 8 characters in length
- 1 uppercase character
- 1 lowercase character
- 1 number
- 1 special character from the following: ! # $ * & ? ~

13

Third Web Version (2011)

- 22 participants were assigned a username and 6-digit PIN as a password
- They were not allowed to change their PIN/password

14

Usability Recommendations
Third Web Version (2011)

- All participants completed a successful log-in using only 1 attempt

BLS

15

Web Diary Feasibility Test (2013)

- 1,426 respondents were asked to record their expenses using the Web Diary

	Web (N = 890)	Paper (N = 2,522)
Response Rate	32%	61%
Total Recall Rate	21%	9%
Week 1: # of Diary Entries	38	42
Week 2: # of Diary Entries	32	38
Total: # of Diary Entries	70	80

BLS

16

Web Diary Feasibility Test (2013)

	Web	Paper
Average Age	50.1	49.6
Average CU Size	2.6	2.5
Ethnicity (Hispanic)	12.7%	9.8%
Gender		
Male	48.5%	51.0%
Female	51.5%	49.0%
Education		
Elementary	0.9%	1.4%
High School	21.1%	26.7%
College	78.1%	71.8%
Never Attended	0.0%	0.1%

17

Web Diary Feasibility Test (2013)

■ How easy or difficult was it to log in?

	Percent (n= 296)
Very Easy	38.5%
Easy	28.0%
Neither Easy nor Difficult	13.2%
Difficult	8.1%
Very Difficult	12.2%

18

Web Diary Feasibility Test (2013)

- % of Respondents Who Reached the Login Screen

Days in Diary Period

Legend: Login Screen, Login Failure Screen
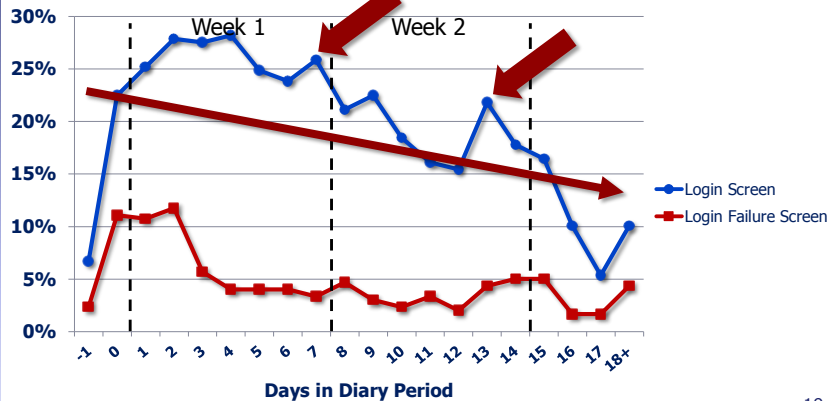
19

First Mobile Version (2013)

- 29 participants assigned 8-digit User ID and 8 character password
- They could change their password
- Respondents do not enter a household roster (i.e., there is no longer PII stored in the Diary)
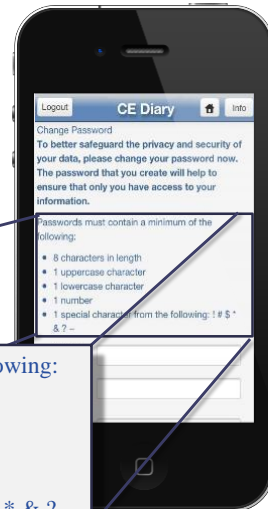

20

Usability Recommendations
First Mobile Version (2013)

- Nearly half of participants had trouble logging in with the provided password
- Only 1/3 of participants were able to successfully change their password without assistance
- "Simplify the password"
- "Limit the use of characters that look alike (e.g., 1, l, I, !)"

Passwords must contain a minimum of the following:
- 8 characters in length
- 1 uppercase character
- 1 lowercase character
- 1 number
- 1 special character from the following: ! # $ * & ? ~

21

15 keys for an
8 character password!

Your Password

ceG6SZP*

22

Individual Diaries
Feasibility Test (2014)

- 1,553 households were given the choice of using the Web *or* Mobile version.

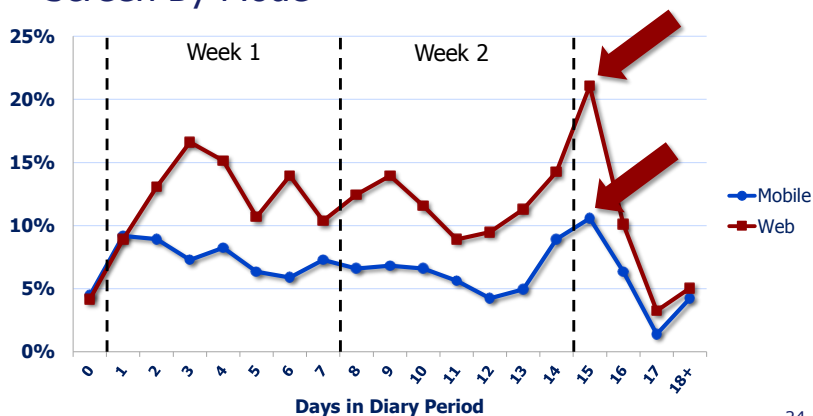|	Web	Mobile	Paper
Response Rate			
Total Recall Rate			
Week 1: # of Diary Entries			
Week 2: # of Diary Entries			
Total: # of Diary Entries			

BLS

23

Individual Diaries
Feasibility Test (2014)

- % of Respondents Who Reached the Login Screen By Mode

Days in Diary Period

BLS

24

Individual Diaries Feasibility Test (2014)

- % of Respondents Who Reached the Login Failure Screen By Mode

Days in Diary Period
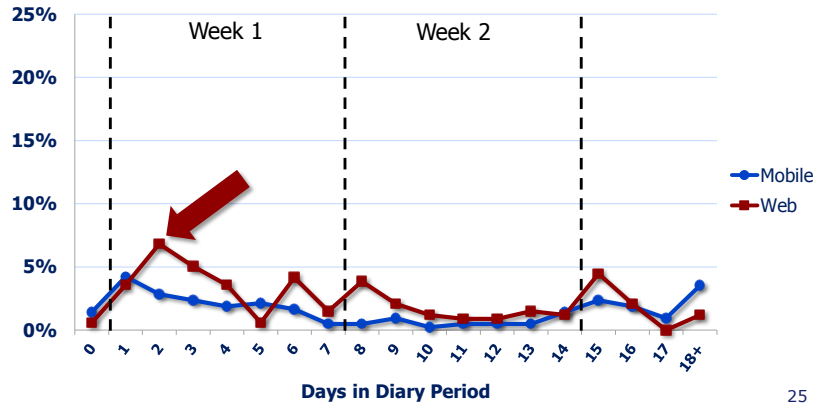
25

7-Digit PIN Test (2015)

- 8 participants were assigned 7-Digit PIN
- They ~~~~~~~~~~ 4 PIN ~~thin limits (cann~~~~~~~~~~~)
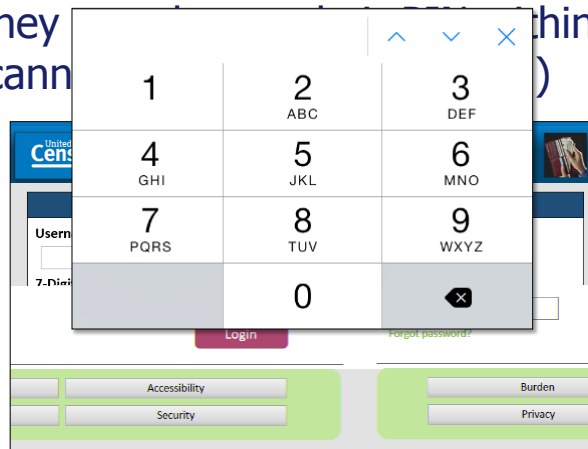
26

Usability Recommendations
7-Digit PIN Test (2015)

- Participants preferred password over PIN
- Needs further study, especially on Mobile
- Continue with current password requirements

CONSUMER EXPENDITURE
DIARY SURVEY

Passwords must contain a minimum of the following:
- 8 characters in length
- 1 uppercase character
- 1 lowercase character
- 1 number
- 1 special character from the following: ! # $ * & ? ~

Cancel   Submit

27

Current Web and Mobile Versions (2015)

- Respondents assigned a username and password
- They can change their username and/or password

CONSUMER EXPENDITURE
DIARY SURVEY

Login

Username:

Password:

Forgot password?
Forgot username?   Login

Need Help? Call the Help Desk toll-free at 877-744-1522 or send an email to NPC.CE.POC.Helpdesk@census.gov

CE Diary

Username:

Password:

Forgot password?
Forgot username?   Login

Need Help? Call the Help Desk toll-free at 877-744-1522 or send an email to NPC.CE.POC.Helpdesk@census.gov

Burden   Accessibility
Privacy   Security

OMB No.: 1220-0050
Approval Expires: 3/31/2016

Risk Management vs. Risk Elimination

- Organizations **use risk assessments to determine authentication needs** and consider…security in **balancing the need to ensure ease of use** for access to federal…information systems **with the need to protect and adequately mitigate risk**. -NIST 800-53, Rev 4, IA-8

Impact	Likelihood		
	Low	**Moderate**	**High**
Low	Low	Low	Mod.
Moderate	Low	Mod.	High
High	Mod.	High	High

29

Discussion Topic

- How do we balance security and usability to ensure that web surveys live up to their promise of making survey response more convenient for respondents, while still keeping their data safe?

©Marty Bucella   www.martybucella.com

"Actually, I'm working on a new computer password."

2

Contact Information

Brandon Kopp
Research Psychologist
Office of Survey Methods Research
www.bls.gov/osmr
(202)-691-7514
kopp.brandon@bls.gov

BLS
BUREAU OF LABOR STATISTICS
U.S. DEPARTMENT OF LABOR

www.bls.gov