

# Assessing Perceived Usability of the Data Curation Profiles Toolkit

## Using the Technology Acceptance Model

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# The Data Curation Profiles Toolkit (DCPT)

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- Created at Purdue for librarians to engage researchers in discussion about data
  - Interview protocol
  - Capture information about a dataset across lifecycle
  - Explore how data are used and managed
  - Identify data curation needs
  - Document generated from data interview

# Using the DCPT

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- Three-stage process



- DCPs as community resource
  - Understand researcher needs with data
  - Inform development of data services
- Data Curation Profiles Directory
  - <http://docs.lib.purdue.edu/dcp/>

# Assessing the DCPT

- Various data collected on how the DCPT has been used
- Study on effectiveness of the DCPT
  - Carlson (2013): Increased users' confidence in discussing data sharing, but time and effort for developing DCP as barrier to use the DCPT
  - Brandt & Carlson (2013): Users recognized utility and impact, and strongly suggested further enhancement for data curation needs (as opposed to data management)

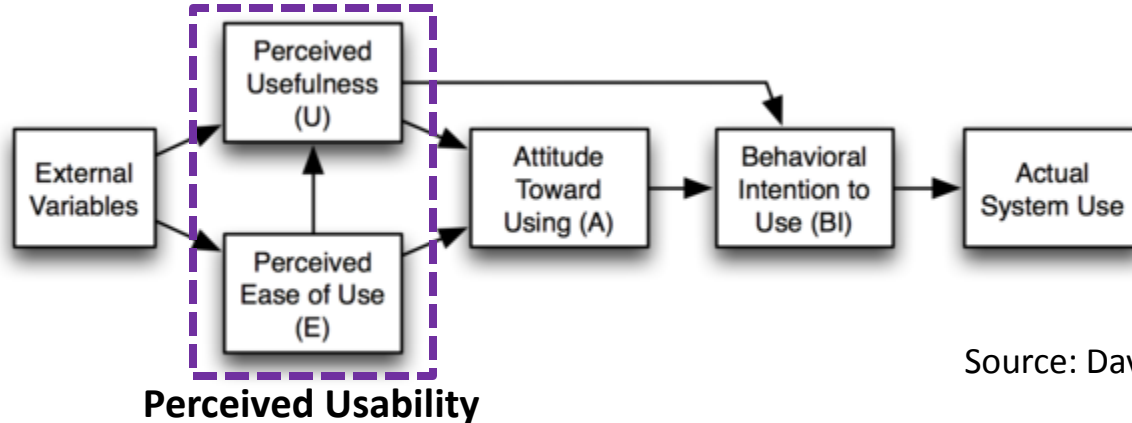
# Motivation

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- **Formal** and **structured** assessment of the DCPT to reveal factors affecting:
  - User perception
  - Intention to use
  - Difficulties
  - Areas to be improved
- Challenge for usability evaluation
  - Time limit
  - Task performance measures

# Technology Acceptance Model (TAM)

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Source: Davis (1989)

- Perceived usability (PU and PEOU)
  - Predict user acceptance and actual usage of technical systems/tools
  - Critical for overall user experience

# Methodology

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- **Survey** of potential determinants of perceived usability (28 questions measured in 5-point Likert scale)
  - “I have experience in conducting one-and-one interviews.”
  - “It takes \_\_ time to learn the DCP Toolkit.”
  - “I can adjust the questions in the DCP Toolkit for use in different situations.”
- **PU, PEOU, and Intention to Use** the DCPT
  - Questionnaire measures adopted from Davis (1989)
- **Open-ended questions**
  - Difficulties and obstacles
  - Areas that user liked and could be improved

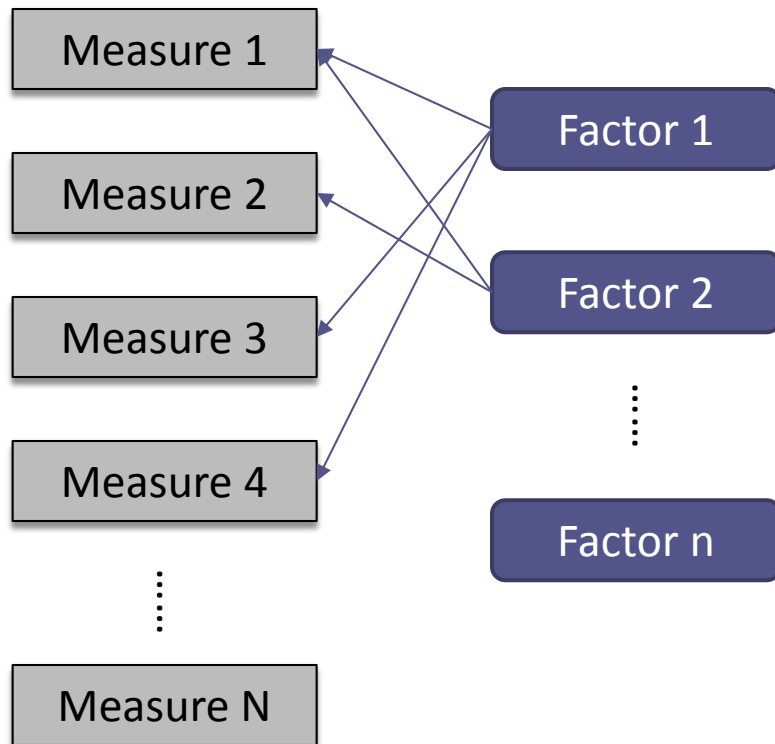
# Methodology

- Survey sent to 895 registered users of the DCPT website in Dec. 2013
  - 28 measures of determinants
  - 221 responses (24.7%) in a month
  - Most respondents are professional librarians with data management related responsibilities
- Data analysis
  - Likert ratings of determinants-> Exploratory Factor Analysis -> Regression Analysis
  - Qualitative analysis of open-ended responses



# Exploratory Factor Analysis

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- Correlations between variables result from sharing of factors
- Uncover underlying structure of a large set of measured variables

# Factor Analysis Results

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- Seven factors extracted for 84.2% of total variance
  - Applicability
  - Time
  - Complexity
  - Experience and Share
  - Training and Help
  - Extensibility
  - Interviewee Requirements
- Factors in regression models to predict PU, PEOU, and Intention to Use

# Regression Results

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- Multivariate, stepwise regression models

$$[\text{PU PEOU Intention to Use}] = \text{Factors 1-7} + \text{error}$$

Perceived Usefulness	Estimated $\beta$
Applicability	3.00
Experience and Share	2.38
Training and Help	1.17

Intention to Use	Estimated $\beta$
Applicability	0.60
Time	-0.41
Complexity	-0.38
Training and Help	0.29
Extensibility	0.33

Perceived Ease of Use	Estimated $\beta$
Applicability	1.12
Time	-1.11 *
Complexity	-1.59
Interviewee Requirements	-1.71

\*p-value = 0.064, sample size > 250 needed to show significance

# Regression Results

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- Multivariate, stepwise regression models  
[Intention to Use] = PU, PEOU + *error*

Intention to Use	Estimated $\beta$
PU	0.156
PEOU	0.054 (p = 0.07 > 0.05)

- All regression models  $R^2$  around 0.5

# Open-ended Questions

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- Questions asked in the survey:
  - “If you used the DCP Toolkit in the past, did you encounter any difficulties? If yes, please explain.” (n=46)
  - “If you plan to use the DCP Toolkit, what would be the obstacles you may encounter?” (n=62)
  - “What are the things you like about the DCP Toolkit?” (n=69)
  - “What are the things you think should be improved in the DCP Toolkit?” (n=54)
- Qualitative analysis method
  - Two independent researchers reviewed and coded responses
  - Two iterations, 66.8% agreement on initial coding and 100% consensus on final coding results

# Open-ended Responses

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- Themes:
  - Amount of time required to use the DCPT vs. depth of information from completed DCP
  - Structure and format of the toolkit
  - Alignment of the DCPT with particular context
  - Using the DCPT to engage faculty and library community

# Open-ended Responses

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- Finding the right balance
  - **Time** required for both researchers and interviewees
  - **Depth of information** in DCP as good utility
- Applicability
  - Adapting structure and format to contexts
  - Making decisions based on results
- Extending the DCPT
  - Compact, “lite version”; online tool
  - Focus on particular data types or fields
  - Community building based on DCPs

# Quantitative vs. Qualitative Results

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- The balance between time and value
  - Interviewee Requirements affect Perceived Ease of Use
  - Complexity and Time affect Intention to Use
  - Time requirement vs. thoroughness in open-ended responses
- Training and Help
  - Significant in regressions on Perceived Usefulness, Intention to Use
  - Open-ended responses requested additional help on:
    - Adaptations for different purposes
    - Transforming collected information into DCPs and making decisions



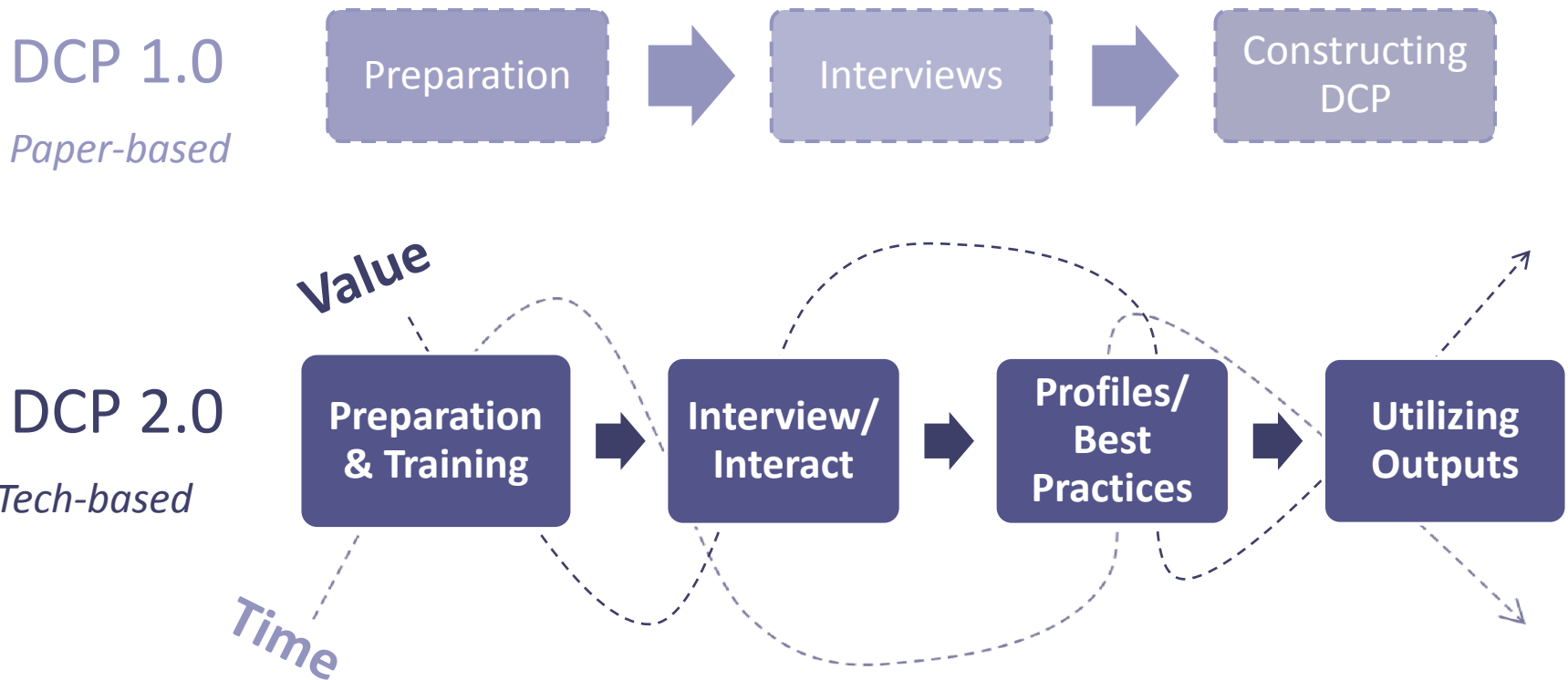
# Conclusion

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- Technology-Acceptance Model useful for assessment
  - Factor analysis & regressions
  - Significant factors identified for Perceived Usability & Intention to Use
- Open-ended responses complement quantitative results
- Usability improvement of the DCPT
  - Reduce time requirement
  - Increase flexibility
  - Training and help

# DCP: What We've Learned & Going Forward

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*DCP 2.0 Roadmap Workshop,  
Purdue University, June 2015*

# Thank you!

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