Methods for automating questionnaire creation using the conceptual instrument framework of DDI-Lifecycle

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THE PURPOSE OF METADATA
Realising positive outcomes using DDI

CHALLENGES IN DATA COLLECTION
Identifying gaps in DDI-Lifecycle

CHALLENGES GETTING DDI-LIFECYCLE ON THE WEB
content + ? = Web-based Survey
content + presentation + structure = Web-based Survey
content + CSS + structure = Web-based Survey
body {
    margin: 4px;
    border: 3px dotted #
    font-family: sans-serif;
    color: #000000;
    background-color: #FFFFFF;
}

h1 {
    padding: 5px;
    margin: 10px;
    border: 1px solid #C0C0C0;
    color:#FF0000;
    background-color:#0000FF;
}
<ddi> + CSS + XForms = Web-based Survey

content + presentation + structure
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Strict//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-strict.dtd">
<html xmlns="http://www.w3.org/1999/xhtml"
     xmlns:xcerpt="http://www.w3.org/2001/XMLSchema-instance">
    <head>
        <title>XYZ</title>
    </head>
    <body>
        <p>
            voluptatem accusantium doloremque
        </p>
    </body>
</html>
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head><title>XYZ</title></head>
<body>
<p>voluptatem accusantium doloremque laborum et</p>
</body>
</html>
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd">
<html xmlns="http://www.w3.org/1999/xhtml">
<head><title>XYZ</title></head>
<body>
<p>
voluptatem accusantium doloremque<br>
totam rem aperiam eaque
</p>
</body>
</html>
<ddi> + CSS + XForms = Web-based Survey

content  presentation  structure
Using DDI to describe the conceptual framework of a survey

LOGICAL FLOW IN XForms AND DDI
1. Do you own a dog?  
   No.... Go to Q 6  
   Yes…

2. What is your dog’s name?  
   ______________

3. What is your dog’s sex?  
   ____________

4. Does he/she play fetch?  
   No.... Go to Q7  
   Yes…

5. What does he/she like to fetch?  
   Tick all that apply  
   a) Ball  
   b) Bones  
   c) Frisbee  
   d) Sticks  
   e) Newspapers  
   f) Postman  
   **Go directly to Q7**

6. What is the main reason you do not own a dog?  
   1. I have an allergy to dogs  
   2. I have a fear of dogs  
   3. I am a postman  
   4. Other, please specify  
      ______________

7. Please provide any comments on the survey.  
   ________________________________
1. Do you own a dog?  
   No…. Go to Q 6  
   Yes…

2. What is your dogs name?  
   ______________

3. What is your dogs sex?  
   ______________

4. Does he/she play fetch?  
   No…. Go to Q7  
   Yes…

5. What does he/she like to fetch?
   Tick all that apply
   a) Ball  
   b) Bones  
   c) Frisbee  
   d) Sticks  
   e) Newspapers  
   f) Postman  
   Go directly to Q7

6. What is the main reason you do not own a dog?  
   1. I have an allergy to dogs  
   2. I have a fear of dogs  
   3. I am a postman  
   4. Other, please specify  
      ______________

7. Please provide any comments on the survey.  
   _______________________________
Main sequencing

Do you have a dog?

Do they have a dog:

Yes

Do they play fetch:

Yes:

What do they like to fetch?

No

What is the main reason you do not own a dog?

Comments

Please provide comments on the survey
Dog Fanciers Survey

Main sequencing

Do you have a dog? (Yes/No)

Yes:
- What is their name?
- What is the sex of the dog?
- Do they play fetch?
  - Yes: What do they like to fetch?
  - No: What is the main reason you do not own a dog?

No: Please provide comments on the survey

Comments
Do you have a dog?

Do they have a dog:

Yes:

What is the name of the dog?

What is the sex of the dog?

Do they play fetch:

Yes:

What do they like to fetch?

No:

What is the main reason you do not own a dog?

Comments

Please provide comments on the survey.
Dog Fanciers Survey

Main sequencing

Do you have a dog?

Do they have a dog:

Yes:

What is their name?

What is the sex of the dog?

Do they play fetch:

Yes:

What do they like to fetch?

No:

What is the main reason you do not own a dog?

Comments

Please provide comments on the survey
Do you have a dog? Do they have a dog: Yes What is the name? What is the sex of the dog? Do they play fetch? Do they play fetch: Yes: What do they like to fetch? No What is the main reason you do not own a dog? Please provide comments on the survey Comments
Main sequencing

Do you have a dog?

- Yes
  - What is their name?
  - What is the sex of the dog?
  - Do they play fetch?
    - Yes: What do they like to fetch?
    - No: What is the main reason you do not own a dog?

- No: Please provide comments on the survey

Comments
Dog Fanciers Survey

Main sequencing

Do they have a dog:

Comments

Do you have a dog?

What is their name?

What is the sex of the dog?

Do they play fetch?

What do they like to fetch?

What is the main reason you do not own a dog?

Please provide comments on the survey
Dog Fanciers Survey

Main sequencing

Do they have a dog:

Comments

Do you have a dog?

What is their name?

What is the sex of the dog?

Do they play fetch?

What do they like to fetch?

What is the main reason you do not own a dog?

Please provide comments on the survey
DON'T MAKE NEW "STANDARDS" OR YOU WILL BE PUNISHED
ResponseML is a dereferenced expression of a DDI-Lifecycle Instrument, not a standard.
Controlling branching and looping within survey instruments

STANDARDISING CONDITIONAL LOGIC IN DDI-LIFECYCLE
ORDERED <SOURCE QUESTION REFERENCE> CONDITIONALS
ORDERED <SOURCEQUESTIONREFERENCE>
CONDITIONALS

<d:IfCondition>
  <r:Code programmingLanguage="orderedSQRConditional">1</r:Code>
  <r:SourceQuestionReference>
    <r:Scheme>
      <r:ID>QuestionSchemeID</r:ID>
      <r:IdentifyingAgency>au.gov.abs.legostormtroopr</r:IdentifyingAgency>
      <r:Version>0.0.1</r:Version>
    </r:Scheme>
    <r:ID>QuestionID</r:ID>
    <r:IdentifyingAgency>au.gov.abs.legostormtroopr</r:IdentifyingAgency>
    <r:Version>0.0.1</r:Version>
  </r:SourceQuestionReference>
</d:IfCondition>
<d:IfCondition>
   <r:Code programmingLanguage="orderedSQRConditional">1</r:Code>
   <r:SourceQuestionReference>
      <r:Scheme>
         <r:ID>QuestionSchemeID</r:ID>
         <r:IdentifyingAgency>au.gov.abs.legostormtroopr</r:IdentifyingAgency>
         <r:Version>0.0.1</r:Version>
      </r:Scheme>
      <r:ID>QuestionID</r:ID>
      <r:IdentifyingAgency>au.gov.abs.legostormtroopr</r:IdentifyingAgency>
      <r:Version>0.0.1</r:Version>
   </r:SourceQuestionReference>
</d:IfCondition>
ORDERED  <SOURCEQUESTIONREFERENCE>
CONDITIONALS

<d:IfCondition>
  <r:Code programmingLanguage="orderedSQRConditional">1,2</r:Code>
  <r:SourceQuestionReference>
    <r:ID>QuestionID_1</r:ID>
  </r:SourceQuestionReference>
  <r:SourceQuestionReference>
    <r:ID>QuestionID_2</r:ID>
  </r:SourceQuestionReference>
</d:IfCondition>
ORDERED <SOURCEQUESTIONREFERENCE> CONDITIONALS

<d:IfCondition>
  <r:Code programmingLanguage="orderedSQRConditional">1,2</r:Code>
  <r:SourceQuestionReference>
    <r:ID>QuestionID_1</r:ID>
  </r:SourceQuestionReference>
  <r:SourceQuestionReference>
    <r:ID>QuestionID_2</r:ID>
  </r:SourceQuestionReference>
</d:IfCondition>
ResponseML XPath CONDITIONALS
ResponseML XPath CONDITIONALS

```xml
<d:IfCondition>
    <r:Code programmingLanguage="responseML_xpath1.0">
        //rml:response[@id='QuestionConstructID'] = 1
    </r:Code>
</d:IfCondition>
```
ResponseML XPath CONDITIONALS

```xml
<d:IfCondition>
  <r:Code programmingLanguage="responseML_xpath1.0">
    //rml:response[@id='QuestionConstructID'] = 1
  </r:Code>
</d:IfCondition>
```
<d:IfCondition>
  <r:Code programmingLanguage="responseML_xpath1.0">
    //rml:response[@id='QuestionConstructID_1'] = 1 and
    //rml:response[@id='QuestionConstructID_2'] = 2
  </r:Code>
</d:IfCondition>
ResponseML XPath CONDITIONALS

```xml
<d:IfCondition>
  <r:Code programmingLanguage="responseML_xpath1.0">
    min(
      //rml:response[@id='QuestionConstructID_1'],
      //rml:response[@id='QuestionConstructID_2']
    ) > 10
  </r:Code>
</d:IfCondition>
```
ResponseML XPath CONDITIONALS

<d:IfCondition>
  <r:Code programmingLanguage="responseML_xpath1.0">
    avg(
      //rml:response[@id='QuestionConstructID_1'],
      //rml:response[@id='QuestionConstructID_2']
    ) > 10
  </r:Code>
</d:IfCondition>
ResponseML XPath CONDITIONALS

```xml
<d:IfCondition>
  <r:Code programmingLanguage="responseML_xpath1.0">
    avg(
      //rml:response[@id='QuestionConstructID_1'],
      //rml:response[@id='QuestionConstructID_2']
    ) > //rml:response[@id='QuestionConstructID_3']
  </r:Code>
</d:IfCondition>
```
COMPARISONS OF LOGICAL EXPRESSIONS

**ResponseML/XPath**
- Can handle complex logic
- Specific to Ramona (for now)
- May support skip generation in the future

**OrderedSQRConditionals**
- Simple Boolean expressions
- Platform independent
- Supports skip statement compilation
RAMONA – A DDI TO XForms
TRANSFORMATION PROTOTYPE
- CSS 2.1
- DDI 3.1
- XForms 1.1
- XHTML 1.0
- XSLT 1.0
- XSLTForms β2
- CSS 2.0 - Presentation
- DDI 3.1 - Content
- XForms 1.1 - Survey Logic
- XHTML 1.0 - User Interface
- XSLT 1.0 - Transformation
- XSLTForms β2 - XForms Engine
<ddi> + CSS + XForms = Web-based Survey

content | presentation | structure
content + presentation + structure = Other Surveys
content + presentation + structure = Computer Aided Interviews
<ddi> + \LaTeX \Rightarrow \text{content + presentation + structure}
1. Did the business listed on the front of this form own and/or operate an agricultural property between 1 July 2011 and 30 June 2012?  
   Yes - own and/or operate only □ Go to Q2  
   Yes - own and operate AND agriculture only (e.g. aerial sprayers, weed control, etc.) □ Go to Q66  
   No - invest only □ Go to Q66  
   No - did not own and/or operate □ Go to Q66

**Part 1 - Business Details**

2. What additional Australian Business Numbers (ABNs) could report for the operations of this agricultural business? If there are no additional ABNs please continue to the next question.

3. Where is the business's main agricultural property located?

**Part 2 - Land Use**

4. Area of holding at 30 June 2012

5. Please provide a breakdown of the total area of your holding according to the main use of the land between 1 July 2011 and 30 June 2012

**Part 3 - Pasture and Crop Cultivation**

6. Did this business cultivate any land on this holding between 1 July 2011 and 30 June 2012?  
   Yes □ Go to Q7  
   No □ Go to Q8

7. Please show the area of land cultivated on this holding between 1 July 2011 and 30 June 2012

**Part 4 - Crop Management**

8. Did this business undertake any crop management practices on this holding between 1 July 2011 and 30 June 2012?  
   Yes □ Go to Q9  
   No □ Go to Q10

9. Please show the area of land on this holding that intercropping was undertaken on between 1 July 2011 and 30 June 2012

10. Did this business use pasture as part of crop rotation on this holding between 1 July 2011 and 30 June 2012?  
    Yes □ Go to Q11  
    No □ Go to Q12

11. Please show the area where pasture was used as part of crop rotation on this holding between 1 July 2011 and 30 June 2012

**Part 5 - Stubble/Trash Management**

12. Did this business undertake stubble and/or trash management practices (e.g. burn or windrow) on this holding between 1 July 2011 and 30 June 2012?  
    Yes □ Go to Q14  
    No □ Go to Q15

13. Please show the area of land on this holding stubble and/or trash management practices were carried out on between 1 July 2011 and 30 June 2012

**Part 6 - Livestock Management**

14. Did this business keep livestock on this holding between 1 July 2011 and 30 June 2012?  
    Yes □ Go to Q16  
    No □ Go to Q17

15. Please show the lambing and weaning rates on this holding between 1 July 2011 and 30 June 2012

16. Did this business keep sheep on this holding between 1 July 2011 and 30 June 2012?  
    Yes □ Go to Q19  
    No □ Go to Q20

17. Please show the average age and average live weight of cattle turned off on this holding between 1 July 2011 and 30 June 2012

18. Did this business keep cattle and/or calves on this holding between 1 July 2011 and 30 June 2012?  
    Yes □ Go to Q22  
    No □ Go to Q23

19. Please show the calving and weaning rates on this holding between 1 July 2011 and 30 June 2012

20. Please show the average age and average live weight of cattle turned off on this holding between 1 July 2011 and 30 June 2012

21. Did this business rotate livestock on grazing land on this holding between 1 July 2011 and 30 June 2012?  
    Yes □ Go to Q24  
    No □ Go to Q25

22. Please show the number of livestock, the area of grazing land and the number of paddocks livestock was rotated on between 1 July 2011 and 30 June 2012

23. Did you use any livestock feed additives or supplements on this holding between 1 July 2011 and 30 June 2012?  
    Yes □ Go to Q26  
    No □ Go to Q27

24. Please show the number of livestock on this holding that feed additives were supplied to between 1 July 2011 and 30 June 2012

25. Please show the number of livestock on this holding that feed supplements were supplied to between 1 July 2011 and 30 June 2012

26. Please show the number of livestock on this holding that feed supplements were supplied to between 1 July 2011 and 30 June 2012
OPEN SOURCE

• Code is licenced as GPL v3

• Code available at: sourceforge.net/projects/ddixformstrans/

• Short link is: http://bit.ly/ddi-xforms

• Currently works with XMLSpy XSLT Engine
CONCLUSION
QUESTIONS?

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