Access and Use: Improving digital multimedia consumer health information

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Consumer Health Information

**Platform**

**Device**

**Access**

**Use**

**Log**

<table>
<thead>
<tr>
<th>Context</th>
<th>Action</th>
<th>Time stamp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Menu</td>
<td>Start Module1</td>
<td>t1</td>
</tr>
</tbody>
</table>

**Consumer**
The Problem

83%
Consumer Health Information

Platform

Device

Context

Action

Time

stamp

Menu

Start Module1

t1

Module1

Close

t2

Access

Use

Operator

Producer

Consumer

Abandon

Operator

Producer

Consumer

Clinical Sponsor

Context | Action         | Time stamp |
---------|----------------|------------|
Menu     | Start Module1  | t1         |
Module1  | Close          | t2         |
## Data Mining

### Module Log

<table>
<thead>
<tr>
<th>Module ID</th>
<th>Time Start</th>
<th>Duration</th>
<th>Censored</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>t1</td>
<td>t2-t1</td>
<td>N</td>
</tr>
<tr>
<td>1</td>
<td>t3</td>
<td>t4-t3</td>
<td>N</td>
</tr>
<tr>
<td>2</td>
<td>t5</td>
<td></td>
<td>Y</td>
</tr>
<tr>
<td>3</td>
<td>t6</td>
<td>t7-t6</td>
<td>N</td>
</tr>
</tbody>
</table>

### Context Log

<table>
<thead>
<tr>
<th>Context</th>
<th>Action</th>
<th>Time Stamp</th>
</tr>
</thead>
<tbody>
<tr>
<td>Menu</td>
<td>Start Module1</td>
<td>t1</td>
</tr>
<tr>
<td>Module1</td>
<td>Close</td>
<td>t2</td>
</tr>
<tr>
<td>Menu</td>
<td>Start Module1</td>
<td>t3</td>
</tr>
<tr>
<td>Module1</td>
<td>Close</td>
<td>t4</td>
</tr>
<tr>
<td>Menu</td>
<td>Start Module2</td>
<td>t5</td>
</tr>
<tr>
<td>Menu</td>
<td>Start Module3</td>
<td>t6</td>
</tr>
<tr>
<td>Module3</td>
<td>Close</td>
<td>t7</td>
</tr>
</tbody>
</table>

### Data Mining

- Module 1: Start Module1 at t1, Close at t2, Duration t2-t1, Censored N
- Module 1: Start Module1 at t3, Close at t4, Duration t4-t3, Censored N
- Module 2: Start Module2 at t5, Duration t5, Censored Y
- Module 3: Start Module3 at t6, Close at t7, Duration t7-t6, Censored N
WITH eventsEnter (RowID, Event_Type, ModuleID, StartTime, Censor) AS
{
    -- Get the unique module Enter events
    SELECT
        [RowID]
    , 'Enter' AS 'Event_Type'
    , [ModuleID]
    , Col5 AS 'StartTime'
    , 0 AS 'Censor'
    FROM [EventsUnique]
    WHERE [Col3] = 'enter'
},
eventsClose (RowID, Event_Type, ModuleID, StartTime, Censor) AS
{
    -- Get the unique module Close events
    SELECT
        [RowID]
    , 'Close' AS 'Event_Type'
    , [ModuleID]
    , Col5 AS 'StartTime'
    , 1 AS 'Censor'
    FROM [EventsUnique]
    WHERE [Col3] = 'close'
}
INSERT INTO [UsageDurations] (ModuleID, StartTime, Duration, Censor)
SELECT
    1 AS 'EnterSessionID'
, ee.ModuleID
, ee.StartTime AS 'TimeStart'
, ISNULL(DATEDIFF(second, ee.StartTime, ec.StartTime),0) AS 'Duration'
, ISNULL(ec.Censor,0) AS 'Censor'
FROM eventsEnter ee
    LEFT JOIN eventsClose ec ON ee.ModuleID=ec.ModuleID AND ec.RowID=(ee.RowID + 1)
ORDER BY ee.StartTime

-- This code snippet builds the set of module usages and their durations
-- censoring the data to 0 for open-ended events

-- Use INNER join to get only events which are deliberately closed
-- or LEFT join and ISNULL to get right-censored data set to 0
-- INNER JOIN eventsClose ec ON
A Case Study

Survival Plot

Survival Plot

Survival Plot

Survival Plot
Comparing curves – Portfolio Analysis
Interpreting The Curves
Comparing Curves – Improvement
Improvement & Learning

Producer

Operator

Clinical Sponsor
Technological
Organisational
Recommendations

• **Platform operators** - make sure that platforms record abandonment events in their log files

• **Producers** - plot the survival curves of the use of the content and ‘experiment’ with content variants to improve their use

• **Clinical sponsors** - warrant that service providers are employing data-driven approaches (such as abandonment of use) to continuously improve