Usability and switching costs in Forecasting Support Systems: An empirical study

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Stavros Asimakopoulos-Department of Computer Science
Gregory Asimakopoulos- Business Management Department
Universidad Carlos III de Madrid

Contact email:
info@sasimako.com
What is the study about?

- Understanding FSS adoption and use: important for organizations, vendors, designers, and users!
- Motivation to investigate intention to switch FSS-considered:
  - Usability metric (Finstad, 2010)
  - Switching costs (Klemperer, 1995; Jones et al., 2002; Burnham et al., 2003)
  - Intention to switch FSS (within the next 2 years)

Previous research on FSS
Why now (crisis)?

- Need to gain competitive advantage or at least retain current FSS customers 😊
- Research need to examine the human issues of FSS (Asimakopoulos et al., 2009; Asimakopoulos et al., 2011) adoption: perceived usability and costs when FSS are used
- Usability and user experience (UX) is not part of current FSS designs/research
  - Performance/monitoring/adjustments/rolling forecasts
  - Switching costs examined in other information systems (IS) settings (e.g. Chen & Hitt, 2002; Kim et al., 2006; Sun et al., 2009)
Switching costs: Klemperer (1987, 1995) describes the effects of switching costs when consumers switch from their current supplier to a new one.

- Compatibility cost
- Transaction costs
- Costs of learning to use new products
- Psychological costs of switching (from our research not the case with FSS).
- Uncertainty about the quality of untested products
- Discount coupons/similar devices (loyalty programs)
What is the study about (II)?

Jones et al. (2002) and Burnham et al. (2003) compiled a list of 8 switching costs:

- Economic risk, evaluation costs, learning costs, set-up costs, benefit loss, monetary loss, personal relationships, brand relationship, loss costs

**Identified 3 higher-order types**

- Procedural switching costs: time and effort
- Financial switching costs: loss of financially quantifiable resources
- Relational switching costs: psychological and emotional discomfort.
So, what to do?

- Designed an empirical study to investigate these issues
- Covered a wide range of areas where FSS are used
- Experienced users working in different sectors
- User FSS switching costs and training used as moderator variables

Research questions

Does usability impact intention to switch FSS?
What is the influence of switching costs on intention to switch?
What is role played by training on the relationship between usability and intention to switch FSS?
What is the empirical model you tested?

- **Training (train)**

**Usability (usab)**
- effectiveness
- satisfaction
- ease-of-use
- efficiency

**Switching costs (sc)**
- need for compatibility
- transaction costs
- cost of learning
- uncertainty about untested software
- loyalty programs

**Intention to switch FSS (intsw)**

**H1**

- H2

- H3

- H4
Will you tell us about the study design and the results?

Web questionnaire located at www.sasimako.com/fss

- **Usability** definition based on ISO 9241-11 (1998)
  Finstad (2010) study effectiveness, efficiency, ease-of-use, user satisfaction measure (4 questions)

- **Switching costs** from various authors: compatibility, learning, transaction, uncertainty about untested new FSS features, loyalty programs, (15 questions)

- **Training**

- **Intention to switch FSS** (3 questions)
Methodology and analysis

Data collection between Oct 2010 and Jan 2011 through various sources: Oracle magazine, LinkedIn groups and users, announcements to participate in forecasting.org and appliedforecasting.com.

Participants
278 participated, final sample: 220 complete questionnaires
Users also provided post-survey comments: Important to further understand how FSS are adopted (but not the focus of this study)
Statistics and results

- Partial Least Squares (PLS) technique used (Fornell & Cha, 1994)
  - Requires relatively small sample size
  - Simultaneous testing of hypotheses while also measures with single and multiple items
  - Use of formative and reflective indicators (Fornell & Bookstein, 1982)
    - Measurement model
    - Structural model
FSS characteristics and user demographics

- 186 males and 34 females (surprising!):
  - User experience: 41.36% (6 years or more),
    23.64% (4-6 years), 5% (7-12 months)
  - Training on the use of FSS: 62% (0-12 weeks),
    38% (13 weeks or more)
- Size of the organizations:
  - 1-50 employees (15%)
  - 51-250 employees (11,82%)
  - 251 employees or more (73,18%)
FSS types included in the sample

Main software product used for forecasting

- 27% spreadsheet package
- 51% forecasting module within ERP system
- 22% stand-alone forecasting package
### PLS results

<table>
<thead>
<tr>
<th>Factor</th>
<th>Variable</th>
<th>Main</th>
<th>Full</th>
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</thead>
<tbody>
<tr>
<td>H1 Usability</td>
<td>usab</td>
<td>-0.348***</td>
<td>-0.341***</td>
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<tr>
<td>H2 SC</td>
<td>comp</td>
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<td>-0.064</td>
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<tr>
<td></td>
<td>trans</td>
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<td>-0.223***</td>
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<tr>
<td></td>
<td>learn</td>
<td>0.068</td>
<td>0.067</td>
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<tr>
<td></td>
<td>uncert</td>
<td>-0.075*</td>
<td>-0.074*</td>
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<tr>
<td></td>
<td>loyal</td>
<td>-0.177**</td>
<td>-0.171**</td>
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<tr>
<td>H3 SC x Usability</td>
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<td>usab*uncert</td>
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<td>usab*loyal</td>
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<td>R²</td>
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<td>0.316</td>
<td>0.319</td>
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***: p<0.01, **: p<0.05, *: p<0.10

\[ f^2 = 0.004 \]

### Training

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<th>H4</th>
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<th>β Low</th>
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<tr>
<td></td>
<td>-0.6297</td>
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Main study conclusions

- **Perceived usability** – distinctive factor that shapes users’ intention to switch FSS
- **Transaction costs, uncertainty about new FSS products, and loyalty programs** – the most important FSS switching costs
- No moderation effect of overall switching costs was found on the relationship between usability and intention to switch
- **Moderation effect of user training** – in particular highly trained users exhibit stronger relationship between usability and intention to switch.
Have you considered the study limitations?

• Assumptions about users’ intention to switch FSS are not straightforward – choice is influenced by organizational decisions/processes, personal and business needs

• Not take into account users’ freedom to customize the FSS – additional benefits offered by the FSS

• Strength of association between switching intention and actual switching remains unclear – need for qualitative/longitudinal studies
Future studies?

• More attention should be paid on the role of users’ participation in the process of buying and using FSS
• Explore methodologies and metrics to improve user experience (UX) with FSS in different organizations
• FSS usability benchmarking studies – within and between different types of products used for forecasting with larger user samples

User experience (UX) as an emerging concept in FSS
Some proposals for FSS vendors

• Incentive for vendors to improve their FSS usability to gain competitive advantage over the other players in the market

• User-centred design strategies – to be incorporated in software design and development

• Provide a highly usable version if the users also buy the support services

• Determine users’ training needs – for different versions of software
References


Thanks for your attention!