Evolution

- Petra Schubert and Uwe Leimstoll, Extending ERP Systems in SMEs into Personalized E-Commerce Applications

- Andreas Voss, Research in Electronic Markets and the Legend of the Yeti: Will we ever find Best Practice in E-Commerce?
Extending ERP Systems in SMEs into Personalized E-Commerce Applications

RSEEM 2003, Bremen

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Leading House  ecademy.ch
Contents

- Motivation
- The research project
- Results of an empirical survey
- Personalization framework
- Finding a standard project method
- Conclusions
- Future Research
What is personalization?

Personalization starts AFTER THE LOGIN

Targeted at the fulfillment of a special requirement of the user

Aimed at people as well as organizational roles in companies (e.g. a purchasing agent)

Personalization is context sensitive (regarding output for a certain user) and requires learning (by the system)
Motivation: Special Requirements of SMEs

- Integrated software packages for personalization are available.
- Expensive applications (for use in large companies)
- Separate consideration of SMEs is meaningful because they differ from corporations in many respects.
- They are characterized by
  - limited financial resources
  - poor conceptual knowledge
  - limited IT resources and
  - low economies of scale and scope.
The Project

- Research project: Personalization of E-Commerce Applications
  - Start of project: June 2000
  - Government funding by soft[net] and KTI
  - Focus: Personalization in SMEs

- Starting position
  - Only a few SME-operated E-Commerce applications use personalization
  - Available standard software tools are not suited for SMEs
  - Competitive disadvantage for SMEs
Research Steps

1999-2000
Research on existing personalization software

SW not suited for SME

2001
Survey in SMEs regarding requirements for personalization

SME want personal.

E-Commerce- Study 2002

2002
Literature review and development of personalization framework

“Handbook Personalization”/ Demonstrator

2003
Prototypes with partners

Lessons Learned

O1 Expectations towards SW

O2 Do SME need personalization?

O3 Know-how in SME is rudimentary

O4 Software must be based on exist. ERP
# Results of an empirical survey

<table>
<thead>
<tr>
<th>Time</th>
<th>August/September 2001</th>
</tr>
</thead>
<tbody>
<tr>
<td>Region</td>
<td>Basel-Stadt and Baselland</td>
</tr>
<tr>
<td>Methode</td>
<td>Questionnaire (paper and Internet)</td>
</tr>
<tr>
<td>Enterprise size</td>
<td>SMEs with 1 to 250 employees</td>
</tr>
<tr>
<td>Target groups</td>
<td>Mainly managing director (owner) and IT manager in SME. Independent IT service companies and management consultants (“experts”).</td>
</tr>
<tr>
<td>Response rate</td>
<td>271 questionnaires, 216 by SMEs and 55 by experts; ratio: 16 percent</td>
</tr>
</tbody>
</table>
Success factors in SMEs

- Quality of the products: 0.66 (0.74)
- Customer advisory service: 0.70 (1.63)
- Delivery reliability: 0.77 (1.53)
- Close customer relations: 0.87 (1.38)
- Efficiency of internal business processes: 0.86 (1.17)
- Application of IT: 0.81 (1.09)
- Production costs: 1.08 (0.72)
- Marketing/Advertising: 1.00 (0.64)

n = at least 207

Less important - Especially important

Arithmetic mean (lower scale) - Standard deviation (upper scale)
Personalized E-Commerce in SMEs (I/II)

- Addressing the customer personally and individually
- Giving customers the opportunity to order online
- Indicating tailor-made purchase recommendations to individual customers
- Offering special prices/discounts to individual customers
- Making special offers to individual customer groups
- Offering special prices/discounts to individual customer groups
- Giving customers the opportunity to look at their previous orders online
- Giving customers the opportunity to order online

Arithmetic mean

SMEs (n = at least 208)
Experts (n = 55)
Personalized E-Commerce in SMEs (II/II)

- Sending a regular newsletter by E-mail: 51% SMEs, 60% Experts
- Recording and analysing customers' surfing and purchasing behaviour: 39% SMEs, 53% Experts
- Tools for evaluating the data recorded: 33% SMEs, 56% Experts
- Cross-selling functions: 31% SMEs, 56% Experts
- Enabling information exchange between customers: 25% SMEs, 24% Experts
- Individual creation of the E-shop structure by customers: 24% SMEs, 27% Experts
- Making available rankings of favourite products: 19% SMEs, 31% Experts
- No statement: 21% SMEs, 18% Experts

Number of answers (multiple answers possible)
ERP Systems in SMEs

→ No standard ERP for SMEs

Anzahl der Nennungen (n = 216)

<table>
<thead>
<tr>
<th>Software</th>
<th>Percent</th>
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<tbody>
<tr>
<td>ABACUS</td>
<td>15.3%</td>
</tr>
<tr>
<td>SAP (R/2 oder R/3)</td>
<td>5.1%</td>
</tr>
<tr>
<td>NAVISION</td>
<td>3.2%</td>
</tr>
<tr>
<td>BISON Solution (alpha px 2)</td>
<td>1.4%</td>
</tr>
<tr>
<td>BRAIN (Brain AS/XPPS/MAS 90)</td>
<td>0.5%</td>
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<tr>
<td>iBaan</td>
<td>0.5%</td>
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<td>infor:com</td>
<td>0.5%</td>
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<td>Movex</td>
<td>0.5%</td>
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<tr>
<td>proALPHA</td>
<td>0.5%</td>
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<tr>
<td>andere</td>
<td>63.9%</td>
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<tr>
<td>keine/ungültige Angabe</td>
<td>8.8%</td>
</tr>
</tbody>
</table>
E-Shop Software in SMEs

No standard E-Shop software for SMEs

- No E-Commerce software: 63.9%
- Winware-eShop: 0.9%
- EasyMarket: 0.5%
- eMMA-WebShop: 0.5%
- andere Standardsoftware: 7.9%
- individuell programmierte Software: 13.9%
- No response: 12.5%

Anzahl der Nennungen (n = 216)
Framework for the Personalization of E-Commerce Systems
Customer Profile Life Cycle

- Step 0) Modeling Customer Profiles
- Step 1) Data Input
- Step 2) Data Processing
- Step 3) Information Output

**Step 0) Modeling Customer Profiles**
- **Data Input**
  - **Explicit**:
    - Identification Profile
    - Preference Profile
    - Ratings
  - **Implicit**:
    - Interaction Profile
    - Transaction Profile

**Step 1) Data Input**
- **Data Processing**
  - **Explicit**:
    - Identification Profile
    - Preference Profile
    - Ratings
  - **Implicit**:
    - Interaction Profile
    - Transaction Profile

**Step 2) Data Processing**
- **Data Mining**:
  - Information Warehouse
- **Information Use**
  - Information (explicit)
  - History (implicit)
  - Situation (Place/Time)

**Step 3) Information Output**
- Learning from Actual User Behavior
- Input for Redesign

- Structure
- Source
- Storage
Step 0) Modeling Customer Profiles

- **Explicit profiles**
  - Identification Profile (name, context information, payment information)
  - Preference Profile (categories)
  - Socio-economic Profile (self-categorization in predefined classes – age, gender, hobbies, ...)
  - Reviews
  - Ratings (of products, reviews, users)

- **Implicit profiles**
  - Transaction Profile
  - Interaction Profile (click stream)
Step 1) Data Input

- Explicit information (reactive approach)
  - Defining categories
  - Asking the customer (Web forms)
  - Categorization of pages (meta data)

- Implicit information, recording customer activity (non-reactive approach)
  - Storing transactions and interactions (log files)
Defining the Right Categories

Preference Profile
- “paper back”
- “middle”
- “Internet Business”

Meta Data
Types:
- Book cover: paper back – hard cover
- Price level: low – middle – high
- Category: Computers – Internet Business – Fantasy – Romance - etc.

Transaction Profile
Products bought:
- 15 paper back, 1 hard cover
- 13 middle, 2 low, 1 high
- 16 Internet Business

Recommendations

Review
xxx xxx xxx
xxx xxx xxx
xxx xxx xxx
xxx xxx xxx
xxx xxx xxx

Rating
“I love it”

Rating
“Very useful”
Step 2) Data Processing

- Data mining/web mining techniques (especially for transaction and interaction profiles)
- Defining rules for the use of the profiles
Step 3) Information Output

- Matching product and user meta information
- Content-based filtering
  - Same/directly linked categorization/meta information in user profile and in product meta information
  - Rule-based approaches
  - Similarity approaches
- Collaborative filtering
  - Match users with a similar taste
Developing a Standardized Project Method for Personalization Projects in SMEs
The consulting projects

- Four projects
- Running time of each project: one year
- Partners
  - Four ERP II system suppliers (Abacus Research AG, OPACC Software AG, Polynorm AG, Simultan AG)
  - Four pilot customers (Also Comsyt AG, Ecomedia AG, KDMZ, Technofil AG)
  - One consultant with experience in personalization projects (TIM Consulting AG)
  - One lawyer with special knowledge on legal aspects of personalization (Weblaw GmbH)
## Project Steps

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<tr>
<th>Tasks</th>
<th>Oct</th>
<th>Nov</th>
<th>Dec</th>
<th>Jan</th>
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<td>Concept development</td>
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</table>

The table above outlines the project steps and milestones for the RSEEM 2003 project, with tasks and their corresponding months.
Ending of a Metaplan® Meeting
Example of a Meta Plan Result (I/II)
[source: company workshop]
Example of a Meta Plan Result (II/II) [source: company workshop]

Differenzierung
Pers-Login/Gruppen-Login

Loginantrag online stellen
Bearbeitung des Loginantrags
automatisieren, manuell: Loginantrag prüfen

Login

Kundendatenpflege
Kunde pflegt seine Daten selber. Was darf der Kunde, was darf er nicht?
Ansprechpartnerverwaltung (insb. ändern, löschen)

Senden (Infomaterial) via Web abonnierbar als PDF-Newsletter (Supply-Line, On Top, ...)
(4 Punkte)

Adresse/Firmen/Personen-Adressen ändern
Liste von Direktlieferadressen hinterlegen
Auftragsbestätigung an mehrere Adressen via vers. Medien


Nach dem Vorgesetzten freigegeben zur Bestellung; abhängig vom Login; Warenkorb füllen, aber nicht abschicken.

(Ware-Side-Funktionalität) (1 Punkt)

Musterwarenkörbe als Vorgabe speichern (für Wiederholkäufe). Abhängig von Kundenummer oder vom Login?

Personeller oder öffentlicher Warenkorb?

Bestellvorgang gemäß Vergangenheitsdaten, d.h. Vorschläge zum Bestellvorgang unterbreiten

Warenkorb

MyShop
15.09.2003 - 13

Präsentation

Aufgabenlegende

Hohe Priorität
(Anzahl der Punkte)

☑ Bereits vorhanden
Das sieht der Vertrieb

Aufgabenlegende

Aufbau der Artikellisten selber anpassen (Anordnung von Feldern und deren Reihenfolge); speichern auf Login-Ebene

Eigene Menüs zur Shop-Bedienung - MyShop. Auf Login-Ebene kann der Kunde selbst definieren, was er sehen will.

Neuheiten der letzten xx Tage (individuell wählbar)
Example of “Rapid Screen Design” (I/II)
[source: company workshop]

<table>
<thead>
<tr>
<th>Wasserfilter XY-12345</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Beschreibung</strong></td>
</tr>
<tr>
<td>Dieser Wasserfilter eignet sich für ... abc def abc def abc def abc def abc def abc def abc def abc def abc def abc def abc def abc def abc def</td>
</tr>
<tr>
<td><strong>Technische Spezifikationen</strong></td>
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<tr>
<td>xyz xyz ...</td>
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<tr>
<td><strong>Bruttopreis:</strong> 150.-</td>
</tr>
<tr>
<td><strong>Ihr persönlicher Nettopreis:</strong> 123.-</td>
</tr>
</tbody>
</table>
Example of “Rapid Screen Design” (II/II)
[source: company workshop]

Wählen Sie die Felder und deren Reihenfolge für die Artikel-Auswahlliste

Nicht gewählt

Originalnummer
Verkaufspreis
Netto-Einkaufspreis
Verfügbarkeit

Gewählt

Artikelnummer
Bezeichnung
Menge
Einheit

Auswahl speichern
Conclusions

- SME acknowledge the *personal* sales approach as a key aspect of their success.
- E-Commerce applications are an *interface* to the customers and their personalization can thus be beneficial for both vendors and customers.
- The ERP is a suitable core for SME-operated personalized E-Commerce applications.
- SMEs need *individual consultation*. They need to identify the value proposition which they can implement on the electronic medium.
- Consultants need special methods and instruments.
Future Research

- Development of a methodology, which allows a systematic consulting process in SMEs
- Development of a Web based Decision Support System (DSS)
- Development of check lists dealing with the legal aspects of personalized Web sites
Thank you!

Questions and Suggestions?

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