Personalization through search roles in collaborative search scenarios

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Background and related work

**CIS**

‘[...] activities that a group or team of people undertakes to identify and resolve a shared information need’

(Poltrock et al. 2003)
Background and related work

group awareness

‘[…] the knowledge and perception of behavioural, cognitive and social context information on a group or its members’ (Bodemer and Dehler, 2011)

Adequate kind of awareness ➔ reduces the cost of coordination and maximizes the benefits of collaboration (Shah & Marchionini 2010)
Background and related work

Roles of users

Individual Information Seeking

CIR

➔ roles based on:
- expertise, e.g. *search expert/search novice*
- search performance: *prospector/miner* (Pickens et al. 2008)
Background and related work

Roles of users

Collaboration/teamwork
e.g. Belbin’s team roles ➔ initially eight team roles in three categories:

**Thinking roles** *(plant and monitor evaluator)*

**Social roles** *(co-ordinator, teamworker and resource investigator)*

**Action roles** *(shaper, implementer and completer-finisher)*

(Belbin 2010a; 2010b)
- Distant collaborative search
  - systems for efficient and effective collaboration

- Raising efficiency, awareness and satisfaction
  - personalize the process through role-specific behaviour patterns
Retrospect

Our research on role patterns for collaborative search
Experiment

- field study
  - 34 information science students
  - 12 teams, 2-4 members
  - task-based
  - duration: two weeks

- mixed methods approach
  1. interaction with a collaborative search system
  2. group interviews
  3. questionnarie
    - based on Belbin’s *Team role self-perception inventory*
## Analysis

When involved in work with other people:

<table>
<thead>
<tr>
<th>Points (in sum 10)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. I like to take responsibility for bringing the team to a consensus.</td>
</tr>
<tr>
<td>b. I verify all the details carefully to ensure that no damaging errors are made.</td>
</tr>
<tr>
<td>c. I will press for action and drive the team towards its objectives.</td>
</tr>
<tr>
<td>d. I come up with unexplored ideas for the team to develop.</td>
</tr>
<tr>
<td>e. I am able to offer support and understanding where it is most needed.</td>
</tr>
<tr>
<td>f. I look for chances to gain personal fulfilment from the work.</td>
</tr>
<tr>
<td>g. I am quick to discover and develop ideas which could be useful to the team.</td>
</tr>
<tr>
<td>h. I am keen to learn as much as I can and apply what I have learned.</td>
</tr>
<tr>
<td>i. I ensure that I remain objective and unbiased.</td>
</tr>
<tr>
<td>j. I will use structure and organization to achieve productivity.</td>
</tr>
</tbody>
</table>

Excerpt from the TRSPI. In total there are eight blocks with ten statements each. The participants allocate points to the statement(s) which present(s) their behaviour best. In each block the points have to be ten in sum.
### System interaction

<table>
<thead>
<tr>
<th></th>
<th>Links</th>
<th>Comments</th>
<th>Files</th>
<th>Chat Messages</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total n</td>
<td>346</td>
<td>193</td>
<td>50</td>
<td>470</td>
</tr>
<tr>
<td>Total $\bar{x}$</td>
<td>10.2</td>
<td>5.7</td>
<td>1.5</td>
<td>13.8</td>
</tr>
<tr>
<td>SR $\bar{x}$</td>
<td>7.7</td>
<td>5.6</td>
<td>1.4</td>
<td>3.1</td>
</tr>
<tr>
<td>TR $\bar{x}$</td>
<td>8.4</td>
<td>9.2</td>
<td>0.2</td>
<td>8.0</td>
</tr>
<tr>
<td>AR $\bar{x}$</td>
<td>12.5</td>
<td>6.1</td>
<td>1.8</td>
<td>20.0</td>
</tr>
</tbody>
</table>

Overview of the interaction with the search system. Given is the total amount (n), the mean average ($\bar{x}$) and the mean average system interaction according to the categories Social Roles (SR), Thinking Roles (TR), and Action Roles (AR).
Group interviews

- based on the qualitative content analysis (Mayring 2015)
- focus: collaboration specific categories, behaviour and interaction during team work

Integrated analysis

... in conjunction with the roles‘ categories (TR, SR, AR)
Results

“social” related roles

✓ Facilitator (n=10)

- focus: team
- supporting/mediating/moderating function
- helps to smooth conflicts in the team
- supports group-specific activities
- average system interaction
Results

“thinking” related roles

✓ **Observer/Editor (n=5)**

- focus: *results*
- low participation in search and team building
- little action at the beginning of the process
- observes, edits, processes and classifies results
Results

“action” related roles

✓ Pathfinder (n=7)
  • focus: start
  • establishes the SearchSpace
  • distributes sub-tasks
  • associated with leadership

✓ Compiler (n=2)
  • focus: end
  • merges results
  • checks results before handing them in
  • takes care for deadlines
  • associated with leadership

✓ Implementer (n=12)
  • focus: search
  • collects information
  • supports search and task processing in general
  • not associated with leading/organising the process
Conclusion + Discussion

- Roles for distant collaborative search
  - Group Awareness
  - Personalization

Awareness, Personalization vs. Privacy

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Conclusion + Discussion

Further studies are necessary to ...

- **Evaluate and validate the search roles**
  - Bigger study with quantitative approach
  - Develop an instrument (questionnaire) to measure the role patterns more efficiently

- **Research the conflict between personalization, awareness and privacy**
  - Is privacy-violation avoidable?
  - Is privacy-violation acceptable under certain circumstances acceptable for the users?
Thank you for your attention!

Questions?
Comments?

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Literature

Literature

- Shah, C. 2012. Collaborative information seeking. The art and science of making the whole greater than the sum of all. Berlin, London: Springer (The information retrieval series, 34)
Backup
Background and related work

**CIS**

‘[...] activities that a group or team of people undertakes to identify and resolve a shared information need’

(Poltrock et al. 2003)

- Explicitly defined among participants
- Intentional
- Interactive
- Mutually beneficial
- Task-based  (Shah 2012)
## Questionnaire

<table>
<thead>
<tr>
<th>Role Category</th>
<th>Total</th>
<th>% TP (n=34)</th>
<th>% TR (n=35)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Social role</td>
<td>10</td>
<td>29.4</td>
<td>28.6</td>
</tr>
<tr>
<td>Thinking role</td>
<td>5</td>
<td>14.7</td>
<td>14.3</td>
</tr>
<tr>
<td>Action role</td>
<td>20</td>
<td>58.8</td>
<td>57.1</td>
</tr>
</tbody>
</table>

Proportion of role categories identified in the study (Total), in relation to the number of test participants (% TP) and to the number of detected team roles (% TR).
Conclusions

RQ: Which role-specific behaviour patterns can be examined in the context of CIS?

• five different role-patterns ➔ execute different steps and show specific behaviours during collaboration

• *pathfinder and compiler* indicate that a certain pattern is not necessarily applied during the whole process
  ➔ *pathfinder* takes a leading position at the beginning of the process, *compiler* takes it at the end
Conclusions

• sample for this study was relatively small (n=34)
  ➔ testing the statistical evidence with a larger sample in a quantitative study

• other domains, other context?
  ➔ other role-patterns?

• influence of roles on effectiveness, efficiency and satisfaction during CIS?
  • development of an instrument for analysing roles prior to collaboration