How to write a scientific paper?

Sjaak Brinkkemper
MBI Colloquium
Outline

1. Compose your message
2. Finding an outlet
3. Structure of Design Science papers
4. Structure of Quantitative Research papers
5. Rules of the game
6. Results so far
1. Compose your message

We assume you are well under way with your MSc graduation project. Usually at a 60-70% stage you should start preparing (mentally and physically) for writing a paper.

- What is your contribution? What is new? What was not known, and is known now?
- A paper is not a summary of your thesis
- Select the best parts of your research findings (cherry picking)
- What position statement do you want to make?
- Formulate a one sentence position statement
2. Finding an outlet

- See the pages at website of Association of Information Systems: www.aisnet.org
  - Upcoming calls under Menu: Publications→ Journal and Book Conference CfPs

- Consult your supervisor

- Discuss an outlet at about half or 2/3rd of your project, because each type of outlet has a different style and level.

- Informatie or AutomatiseringGids (in Dutch) are very positive towards MSc thesis summaries.
  
  Works very well in recruitment interviews. 😊
Select an outlet

Level
1. Workshop: 30 – 50 submission with 50% acceptance rate
2. Conference: 100 – 500 submissions with a 10-25% acceptance rate
3. Journal: 30% acceptance rate with long lead times

Subject
1. Narrow: Web Information Systems Modeling
3. Broad: Information Systems

Region
1. National
2. European, Americas, Asia, Australia, Nordic
3. Worldwide

❖ The higher the more competitive
❖ For students it is most successful to focus on a focussed European workshop
Professional journals covering MBI subjects (Netherlands)
- Informatie
- Computable
- AutomatiseringsGids
- IT Executive
- CIO Magazine
- Outsourcing magazine
- Intellectueel Kapitaal (Knowledge Management)

English journals:
- Computerworld
- BYTE
- Dr. Dobbs
- Computer Companion
- and many, many more.
3. Structure of design science papers

Abstract
1. Introduction with a good title to scope the paper
2. Key contribution
3. Elaboration of the research ...
4. ... in a convenient ...
5. ... chapter structure ...
6. Conclusions and further research

Acknowledgements
References

Readers and reviewers want to know the scientific contribution quickly, in order to assess the relevance of the work.
Focus on the main interesting results first!
Start with the main message in section 2
Elaborate in the next sections
Note: different for quantitative papers
IS Research Framework

[from Hevner et al. 2005]
Title

- Descriptive title covering the domain and the contribution

- Nice alliterations or paraphrasing of proverbs
  - “Maturity Matters”
  - “Useful but Unused”
  - “Turning the Ugly Duckling into a Swan”

- No punctuation, except for : for subtitle

- No unknown acronyms
Abstract

- First sentence is problem statement

- One sentence per chapter

- Some overall conclusion at the end to position the conclusion

- Do not oversell your contribution

- Choose keywords known in the domain and from the list of topics in the Call for Papers
  - Good keywords are an SLR catch, so important for impact and citations
Introduction

- Give Introduction a **good title to scope** the paper, e.g.
  1. Introduction: Software Supply Networks

- Problem description with some **published evidence** (collect continuously! Not again the Chaos report)

- **Literature perspective** with related work

- Main research question

- Main **contribution** of the paper

- Outline of the paper

- Sometimes **Related Work** is a separate chapter
Chapters 2, 3 and ff

- Key contribution
- The design artefact
- Proper explanation
- Adhere to the customs in the area
  - With examples, meta-models, formal mathematics
  - Check the style of the papers in the outlet of the previous years
- Be aware that many papers have suggested similar designs
  - What makes your solution different?
- Other chapters explain design artefact
  - Overall method with steps
  - Further explanation of details
  - Case study/ies with examples
Conclusions

Conclusions and further/future research

- **Major findings**: some kind of summary without being a summary
- **Limitations** of the study, be honest
- Some outlook of the usage
- Some speculations, but not overselling
- Future research

- Avoid references to future work of yourself in this chapter, unless it has been finalized.

Note: Reference to MSc thesis as **Technical Report** of UU CS department. (Get instructions from supervisor)
4. Structure of quantitative research papers

1. Introduction
2. Problem statement, research question
3. Theory model with existing knowledge
   Framework, hypothesis
4. Data collection
   Measurement and validation
5. Analysis
6. Discussion
7. Conclusion and evaluation

Title and abstract are similar as for Design Science papers
Ch. 1. Introduction with trigger

“Organizational performance of CRM usage is still beyond expectations ...”

<table>
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<tr>
<th>Source</th>
<th>N</th>
<th>Base</th>
<th>Performance</th>
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<td>IT commerce</td>
<td>400</td>
<td>NL, 2002</td>
<td>66% ‘satisfied’</td>
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<tr>
<td>Giarte</td>
<td>104</td>
<td>NL, 2003</td>
<td>25% positive ROI</td>
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<td>Siebel customers</td>
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<td>75% ‘better business performance’</td>
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Ch. 2/3 Theory model

Provide an adequate theory. Should be in your MSc thesis already!!
Hypotheses:
Higher CRM Performance leads to more ....

Customer Satisfaction
Customer Retention
Effective route to market
Ch. 4 Data collection

A careful account of the data collection is required

For example:

- 3 Experts Meetings
- 31 respondents of 30 organisations
- Between 10 and 10,000 fte
- All sectors
- On-line questionnaire
- Group discussion meeting
### Ch. 5. Analysis (tabular)

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<th>Alignment score based on total set of items</th>
<th>Sum of all 3 progress performance variables</th>
<th>Sum of all 6 performance variables</th>
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<tr>
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<td>0.09</td>
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<td>0.11</td>
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</table>

Adhere to standards in research domain!
Ch. 5 Analysis (figure)

Alignment score based on total set of items

Sum of all 6 performance variables

0 10 20 30

5.0 4.5 4.0 3.5 3.0 2.5 2.0 1.5
Main findings with discussion in perspective existing knowledge

Conclusions:
Similar as Design Science paper
Design the structure of the paper

I Introduction
- Twin peaks
- Joint use models
- Discussion model (paper Gilson)
- Decision making
- Why, how
- Context.
- Rationale

II Capturing Discussion
- Main idea
- Discussion: all is read
- Discussion: video wall
- Discussion: who?
- Discussion: what?
- Discussion: why?
- Discussion: decisions
- Discussion: conclusions
- Discussion: derivation

III Possible Uses
- How while we that
- Jan view ours?
- Situations
- Scenarios

IV Outlook
- Enable further research
- Towards continuous arch.
- Automatic decision making
- Other (CART)

Facilitating Collaborative Decision Making
With the Software Architecture Video Wall

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Utrecht University
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5. Rules of the game

- The **supervisors** of both the academic side as well as the organisation side are *all invited as co-authors*
  Even when they will not write *any* texts
- They have been helpful in arranging the research environment, in establishing good research questions, and providing suggestions.
- **Co-authorship makes friends!**
  But never put a name without asking!
- It can be that a *PhD wishes to be first author*: discuss during the start of the project

- The department of Information and Computing Sciences can **not** pay for a trip of students
  We are looking for sponsoring opportunities.
RICE test for a paper

RICE: is the paper worth reading?

- **Rigour**: show that the research process is adequately and thoroughly performed
- **Interesting**: the results are appealing for a wide audience
- **Contribution**: significant and valuable addition to knowledge
- **Exposition**: explain everything in a logical and clear manner
Papers, grade, and CV

- A completed scientific paper is required to score an 8 or more for your graduation thesis project.

- Students heading towards a 6 or 7 should aim at writing an article for professional journal.

- List papers on your CV.
- Publications are considered as a very valuable asset by many organizations.
Tips for writing a paper

- Suppose you are writing a paper for ECIS next year with the deadline around 1 December.
- Look at the call for papers
- Find the topics or the track of your contribution topic
- Discuss this all with your supervisors. Meeting 1.5hrs.
- Analyse the structure and contents of about 6 recent(!) ECIS papers with a comparable subject.
- Construct a preliminary title that covers your message best.
- Draft the abstract as a kind of to-do list with for every chapter just 1 sentence.
- Adapt the structure of the paper when needed.
- Start every chapter on a new page with keywords, links to thesis and tekst snippets.
- Cut-and-paste possible contents from your thesis in the paper doc.
- Write a preliminary introduction and conclusion (can be defective and unpolished) as kind of hammock for the story.
- Elaborate the paper.
- Put some references to the PC members
- Submit the paper: have a very good look at all the requirements on the paper: double blind, page limit, referencing style, etc.
6. Results so far

- So far hundreds MBI students have published hundreds papers with their co-authors.
- ~40% of students write paper
- ~8% of students become PhD

- MBI is one of the largest ICT master in the Netherlands

- “MBI educates students at an international research level” (Educational certification committee, January 2007)
## Statistics

<table>
<thead>
<tr>
<th>Year</th>
<th>Papers with MSc students</th>
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<tr>
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<td>2014</td>
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<td>2015</td>
<td>24</td>
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<td>2016</td>
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</table>

### Since start of MBI
- Number of graduated students: **450**
- Pursued a PhD: **34**
- Started an academic career: **10**

[Status: October 2017]
Some hard work, but then …  

- Writing a scientific paper is very rewarding!
- Get yourself listed in scholar.google.com and dblp.org
- Get citations!
Questions?

Good luck and have fun!