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# Winter Documentation

Design Thinking at ThyssenKrupp 2014/15

March 8, 2015

Text



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# Management Summary

ThyssenKrupp Industrial Solutions has engineers all around the world. Since their collaboration process is not aligned perfectly, the challenge is to find out how the collaboration of engineers can be improved. This challenge is tackled by a joint team of eight students in total from the University of St.Gallen and the Hasso Plattner Institute. To come up with a solution the methodology of Design Thinking is used. The following report is a summary of the last few weeks where we worked on the first two phases of the Design Thinking cycle: the Design Space and Critical Function Prototype phase.

During the Design Space phase (Chapter 2), we conducted a benchmark across several industries to see how other companies handle the issue of collaboration. Furthermore, we had a look into existing tools to get an overview about state of the art technologies. The benchmark already gave us first insights and needs of users with regard to team collaboration. Afterwards, we continued our study of insights and needs by conducting interviews within ThyssenKrupp. Recently, we were able to talk to engineers in Germany and India. All the knowledge we collected about the topic helped us to define two personas, which could be typical users at ThyssenKrupp.

By analyzing the needs and insights, we were able to identify critical functions and experiences (Chapter 3). They are the basis for the development of the prototypes. We selected ten different prototypes for this report and each of them fulfills one or several critical functions and experiences. Various users tested the prototypes afterwards, so we have been able to gather feedback and to learn more about them in order to be able to improve them or create new prototypes.

The project lasts until June 2015, so this report is just about the first findings. Our current activities will continue as we might need specific benchmarks for a certain topic for example, but the process of Design Thinking continues with the phases of Dark Horse and Funky Prototypes. Afterwards, our designs and prototypes will converge until a final prototype is presented in June 2015.



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ABC	Spelled-out abbreviation and definition
BABI	Spelled-out abbreviation and definition
CABR	Spelled-out abbreviation and definition



**Part I**  
**Part Title**

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# Chapter 1

## Chapter Heading

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Please note that the first line of text that follows a heading is not indented, whereas the first lines of all subsequent paragraphs are.

Use the standard `equation` environment to typeset your equations, e.g.

$$a \times b = c, \quad (1.1)$$

however, for multiline equations we recommend to use the `eqnarray` environment<sup>1</sup>.

$$\begin{array}{l} a \times b = c \\ \mathbf{a} \cdot \mathbf{b} = \mathbf{c} \end{array} \quad (1.2)$$

### 1.2.1 Subsection Heading

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Please note that the first line of text that follows a heading is not indented, whereas the first lines of all subsequent paragraphs are.

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1. Livelihood and survival mobility are oftentimes coutcomes of uneven socioeconomic development.
  - a. Livelihood and survival mobility are oftentimes coutcomes of uneven socioeconomic development.
  - b. Livelihood and survival mobility are oftentimes coutcomes of uneven socioeconomic development.
2. Livelihood and survival mobility are oftentimes coutcomes of uneven socioeconomic development.

### *Subparagraph Heading*

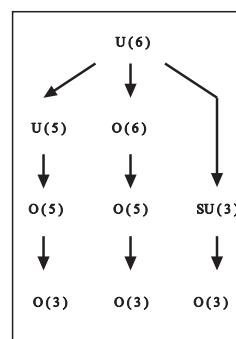
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Please note that the first line of text that follows a heading is not indented, whereas the first lines of all subsequent paragraphs are.

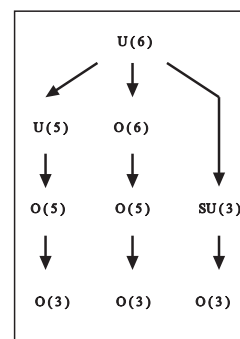
For unnumbered list we recommend to use the `itemize` environment – it will automatically render Springer’s preferred layout.

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  - Livelihood and survival mobility are oftentimes coutcomes of uneven socioeconomic development.
  - Livelihood and survival mobility are oftentimes coutcomes of uneven socioeconomic development.
- Livelihood and survival mobility are oftentimes coutcomes of uneven socioeconomic development.

**Fig. 1.1** If the width of the figure is less than 7.8 cm use the `sidecaption` command to flush the caption on the left side of the page. If the figure is positioned at the top of the page, align the sidecaption with the top of the figure – to achieve this you simply need to use the optional argument `[t]` with the `sidecaption` command



**Fig. 1.2** Please write your figure caption here



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*Run-in Heading Italic Version* Use the  $\LaTeX$  automatism for all your cross-references and citations as has already been described in Sect. 1.2.

**Table 1.1** Please write your table caption here

Classes	Subclass	Length	Action Mechanism
Translation	mRNA <sup>a</sup>	22 (19–25)	Translation repression, mRNA cleavage
Translation	mRNA cleavage	21	mRNA cleavage
Translation	mRNA	21–22	mRNA cleavage
Translation	mRNA	24–26	Histone and DNA Modification

<sup>a</sup> Table foot note (with superscript)

## 1.3 Section Heading

Instead of simply listing headings of different levels we recommend to let every heading be followed by at least a short passage of text. Furtheron please use the  $\LaTeX$  automatism for all your cross-references and citations as has already been described in Sect. 1.2.

Please note that the first line of text that follows a heading is not indented, whereas the first lines of all subsequent paragraphs are.

If you want to list definitions or the like we recommend to use the Springer-enhanced `description` environment – it will automatically render Springer’s preferred layout.

Type 1 That addresses central themes pertaining to migration, health, and disease. In Sect. 1.1, Wilson discusses the role of human migration in infectious disease distributions and patterns.



Type 2 That addresses central themes pertaining to migration, health, and disease. In Sect. 1.2.1, Wilson discusses the role of human migration in infectious disease distributions and patterns.

### 1.3.1 Subsection Heading

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Please note that the first line of text that follows a heading is not indented, whereas the first lines of all subsequent paragraphs are.

If you want to emphasize complete paragraphs of texts we recommend to use the newly defined Springer class option `graybox` and the newly defined environment `svgraybox`. This will produce a 15 percent screened box 'behind' your text.

If you want to emphasize complete paragraphs of texts we recommend to use the newly defined Springer class option and environment `svgraybox`. This will produce a 15 percent screened box 'behind' your text.

#### 1.3.1.1 Subsubsection Heading

Instead of simply listing headings of different levels we recommend to let every heading be followed by at least a short passage of text. Furtheron please use the  $\LaTeX$  automatism for all your cross-references and citations as has already been described in Sect. 1.2.

Please note that the first line of text that follows a heading is not indented, whereas the first lines of all subsequent paragraphs are.

**Theorem 1.1.** *Theorem text goes here.*

**Definition 1.1.** Definition text goes here.

*Proof.* Proof text goes here.  $\square$

#### Paragraph Heading

Instead of simply listing headings of different levels we recommend to let every heading be followed by at least a short passage of text. Furtheron please use the

L<sup>A</sup>T<sub>E</sub>X automatism for all your cross-references and citations as has already been described in Sect. 1.2.

Note that the first line of text that follows a heading is not indented, whereas the first lines of all subsequent paragraphs are.

**Theorem 1.2.** *Theorem text goes here.*

**Definition 1.2.** Definition text goes here.

*Proof.* Proof text goes here. □

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## Appendix

When placed at the end of a chapter or contribution (as opposed to at the end of the book), the numbering of tables, figures, and equations in the appendix section continues on from that in the main text. Hence please *do not* use the `appendix` command when writing an appendix at the end of your chapter or contribution. If there is only one the appendix is designated “Appendix”, or “Appendix 1”, or “Appendix 2”, etc. if there is more than one.

$$a \times b = c \tag{1.3}$$

## Problems

**1.1.** A given problem or Exercise is described here. The problem is described here. The problem is described here.

### 1.2. Problem Heading

- (a) The first part of the problem is described here.
- (b) The second part of the problem is described here.

## References

In view of the parallel print and (chapter-wise) online publication of your book at [www.springerlink.com](http://www.springerlink.com) it has been decided that – as a general rule – references should be sorted chapter-wise and placed at the end of the individual chapters. However, upon agreement with your contact at Springer you may list your references

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1. all works by the author alone, ordered chronologically by year of publication
2. all works by the author with a coauthor, ordered alphabetically by coauthor
3. all works by the author with several coauthors, ordered chronologically by year of publication.

The *styling* of references<sup>4</sup> depends on the subject of your book:

- The *two* recommended styles for references in books on *mathematical, physical, statistical and computer sciences* are depicted in [1, 2, 3, 4, 5] and [6, 7, 8, 9, 10].
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- Examples of the basic Springer style used in publications on a wide range of subjects such as *Computer Science, Economics, Engineering, Geosciences, Life Sciences, Medicine, Biomedicine* are [21, 22, 24, 23, 25].

1. Broy, M.: Software engineering — from auxiliary to key technologies. In: Broy, M., Dener, E. (eds.) *Software Pioneers*, pp. 10–13. Springer, Heidelberg (2002)
2. Dod, J.: Effective substances. In: *The Dictionary of Substances and Their Effects*. Royal Society of Chemistry (1999) Available via DIALOG. [http://www.rsc.org/dose/title of subordinate document](http://www.rsc.org/dose/title%20of%20subordinate%20document). Cited 15 Jan 1999
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7. H. Ibach, H. Lüth, *Solid-State Physics*, 2nd edn. (Springer, New York, 1996), pp. 45–56
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<sup>3</sup> Make sure that all references from the list are cited in the text. Those not cited should be moved to a separate *Further Reading* section or chapter.

<sup>4</sup> Always use the standard abbreviation of a journal's name according to the *ISSN List of Title Word Abbreviations*, see <http://www.issn.org/en/node/344>

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## Appendix A

### Chapter Heading

*All's well that ends well*

Use the template *appendix.tex* together with the Springer document class SVMono (monograph-type books) or SVMult (edited books) to style appendix of your book in the Springer layout.

#### A.1 Section Heading

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##### A.1.1 Subsection Heading

Instead of simply listing headings of different levels we recommend to let every heading be followed by at least a short passage of text. Furtheron please use the L<sup>A</sup>T<sub>E</sub>X automatism for all your cross-references and citations as has already been described in Sect. A.1.

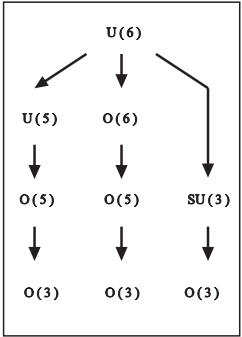
For multiline equations we recommend to use the `eqnarray` environment.

$$\begin{array}{l} \mathbf{a} \times \mathbf{b} = \mathbf{c} \\ \mathbf{a} \times \mathbf{b} = \mathbf{c} \end{array} \quad (\text{A.1})$$

##### A.1.1.1 Subsubsection Heading

Instead of simply listing headings of different levels we recommend to let every heading be followed by at least a short passage of text. Furtheron please use the

**Fig. A.1** Please write your figure caption here



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**Table A.1** Please write your table caption here

Classes	Subclass	Length	Action Mechanism
Translation	mRNA <sup>a</sup>	22 (19–25)	Translation repression, mRNA cleavage
Translation	mRNA cleavage	21	mRNA cleavage
Translation	mRNA	21–22	mRNA cleavage
Translation	mRNA	24–26	Histone and DNA Modification

<sup>a</sup> Table foot note (with superscript)

# Glossary

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# **Solutions**

## **Problems of Chapter 1**

**1.1** The solution is revealed here.

### **1.2 Problem Heading**

- (a) The solution of first part is revealed here.
- (b) The solution of second part is revealed here.



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