

Preface

In everyday IT work, the term “software architecture,” or “architecture” in general, has become ever-present, and due to its enormous relevance for project success, can no longer be ignored. Business cards show job titles such as Security Architect, Data Architect, System Architect, or even Enterprise Architect. We create documents with the title “Solution architecture” for customers, for example, or customers themselves request architecture from suppliers. Although the term “architecture” is used so frequently, on closer inspection, it is clear that architects, project leaders, developers, and other stakeholders do not share a common understanding of the term.

For some of us, “architecture” is the selection and use of a technology; for others, “architecture” is a process; for many, “the architecture” is a folder with drawings containing geometrical figures connected to one another; for others again, “architecture” may be everything that “the architect” produces—whatever this may be. In its practical use, the term “architecture” covers quite a broad scope—that is, it is not defined or understood uniformly. This often makes it difficult for several people to work together and communicate efficiently in the architecture domain and in daily working life.

When we decided to write a book about software architecture some years ago, we started our project by initially taking stock. We quickly learned that even within a strictly limited group of experienced software architects, it was not as easy to clearly define software architecture itself as we had expected. We realized that, even though we all had years of experience in designing, describing, or verifying software architectures, we did not have a uniform, precise understanding of the architecture domain.

We became more and more aware of how important it was to develop a common understanding and vocabulary. An architecture framework that establishes a common, uniform terminology would allow us to look at and explain the architecture topic discriminately. This type of holistic framework was something we had always been looking for in our professional careers.

We looked back to the time when we ourselves were primarily software developers and were confronted with the term “software architecture” for the first time. At this point in time, “software architecture” was a very abstract term for us, and it was difficult for us to really grasp what it meant. There was no intuitive architecture framework available that would have enabled us to understand this

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...**

**... initially even
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authors**

**Our desire for
an architecture
framework ...**

... and orientation

important field of topics. Theory and practice concentrated primarily on individual aspects of architecture and did not allow a holistic understanding. We therefore tried to find order amongst the architecture chaos ourselves. For a long time, we had all been subconsciously or intuitively looking for a framework that covers the important dimensions of the architecture domain. At the beginning of our journey through the IT world, we needed a lot of technical and detailed knowledge. We therefore concentrated on acquiring knowledge about techniques and technologies, process models, methods, and organizations. In the course of our professional life and thus throughout our educational journey, each one of us, constantly and partly without being aware of it, derived *his* understanding of the architecture domain from this collection of isolated individual insights. With this book project, we had finally arrived at the point where we could reconcile our individual understandings, bring them together to formulate a common understanding, and make this the core of our book.

Our architectural thinking developed over time

We all knew that there is *no one* architecture examination that gives *the one* architecture certificate that you can pass or acquire in order to then be able to call yourself a certified architect. In the course of our lives as computer scientists, we had all already worked in lots of roles. As analysts, software developers, testers, project leaders, designers, or enterprise architects, we knew that architecture has many faces and that the architecture aspect is decisively important for many roles—not solely for the role of the architect. Our experience was also that, in addition to further technical education, we first had to gather sufficient practical experience before we could start to think “architecturally.”

Our book vision

The primary goal of our book is to give readers orientation in the architecture domain. In our view, many books about architecture focus too heavily on the topic of technology. Other books concentrate on architecture documentation and nomenclatures and their related techniques. Some other books look at solution patterns for architecture problems. And finally, relevant computer magazines regularly cover reports on project experiences in which the architecture aspect of a solution presented is very often the factor that gives the article its substance. However, in our opinion at least, hardly any of these works attempt to give the reader a comprehensive orientation in the topic of architecture. Most of the books we know concentrate only on selected sub-areas of architecture. And the few books that cover architecture more broadly still lack more or less a thorough structure that provides orientation, or rather, a book architecture.

Our challenges

We thus faced two great challenges. The first challenge was to design a book structure that addressed the aspects of orientation, theory, and practice—for us, all of these aspects are equally important. Our second challenge was to develop and describe a software architecture model that then allowed us to work through

the multi-dimensional nature of this topic appropriately and to use it as a stable core for our book. The result of this initial and fundamental work was the architecture of the book itself. We describe this in detail in Chap. 2 and it is structured as follows:

- > Explanation of the architecture dimensions (e.g., requirements in the context of architecture) based on a holistic architecture framework.
- > Presentation of the parts of the individual architecture dimensions relevant in practice.
- > Practical application of the architecture contents covered in the book.

This book is thus the result of our desire for a work that structures the topics around architecture sensibly, is based on practice, and that conveys corresponding practical experience. In particular, the book is independent of any specific technology and is timeless. For us therefore, this book belongs to that group of fundamental works that provides you with a stable and future-proof reference system that goes beyond current technological trends. The task that we set ourselves with writing this book was not easy—it required all of the authors to look at the topic of architecture intensively and in great depth beyond the otherwise usual level of considering different aspects in isolation. In the time in which we produced this book, we learned a lot. We discussed and debated with one another. As a result of working together on this book, we gained a lot of new and valuable knowledge and a common understanding of architecture.

You now hold our understanding of architecture in your hands. We hope that our claim of arranging and explaining the topic of architecture for you, and anchoring it in practical examples, will help you in your dealings with this interesting and important area of your working life or your studies.

The first edition of this book appeared on the German-speaking market in autumn 2005. In our view, the great success that the first edition enjoyed was connected to the fact that at this time, conceptual, planning, educational, or organizational contributions in IT had gained importance to the extent that specialized technical knowledge was outsourced to countries with pay structures and an expert basis that further encouraged this trend. From then on, the role of the architect, with its holistic and integrative view of the IT challenges, formed the spearhead of a new generation of training profiles within computer science and neighboring domains. This had a corresponding positive effect on the sales of our fundamental work.

The high demand for the first edition of our book meant that we were able to offer our German-speaking readers a revised and updated second edition of the book in 2008.

Our book

History of the book and the English version

In the meantime, we received numerous requests from non-German-speaking colleagues to provide an English translation of our book. All of the authors work in an international, primarily English-speaking environment, and, thanks to presentations at IT conferences or university contacts, have regular exchanges with English-speaking colleagues. We therefore quickly agreed when we received a request from Springer for a further revised version of our book—this time in English. We used the opportunity of producing an English translation to improve the contents further based on reader feedback, our practical experience, and current IT developments, such as cloud computing.

Although the translation and the repeated revision of this third edition cost our translator and us as authors many hours of our free time, we are all happy that we took advantage of this opportunity. In particular, we are delighted to finally be able to offer our book to a global audience.

Our thanks

At this point we would like to thank everyone who gave us the freedom to work on this project and who supported us. This includes our partners and children, our friends and colleagues, our employers and superiors. We would like to thank all of those who gave up their time for us and constantly gave us new strength.

Our sincere thanks also go to our translator, Tracey Duffy. With her extremely professional and team-oriented approach and her great talent for technical translation, she provided us with continuous support in realizing this translation project. Her assistance enabled us to meet our high quality standards, and to do so highly efficiently and right on schedule.

Finally, we would like to thank Ralf Gerstner at Springer, who provided us with continuous and professional support in producing this third edition of our book, and who did so with great patience.

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Practitioners

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