Service Orientation promises to rehabilitate pre-existing legacy assets by encapsulating them as added-value services. Migrating those legacy assets into services that can smoothly operate with modern technology has become a challenging and complex task. Such complexity amounts to the shift in the ways we conceive services, compared to the ways legacy assets are already developed: from a large system to a set of small pluggable services, where services are neither owned nor always part of a “monolithic” system. Services are well-specified, loosely coupled, and cohesive pluggable elements, whereas legacy assets are often tightly coupled, not cohesive, and support multiple business functionalities. Those inherent distinctions make the service-enabling of the legacy assets to be a complex and demanding task. Under such a complex environment, the ways migration is guided can greatly influence the outcome of the migration. This is the topic of this thesis, namely, how SOA migration can be guided.

The research in this thesis started by understanding what SOA migration entails. Obtaining such an understanding in an emerging and still fuzzy research field like SOA migration, however, is difficult. To provide such an understanding, we defined a framework, called SOA-MF, that facilitates characterizing different migration approaches. Hence, a general understanding of the migration approaches was reached by mapping and positioning those approaches on SOA-MF.

With the goal of understanding how SOA migration is perceived in academic research, we carried out a systematic literature review. Using the framework we categorized academic migration approaches. As a result, we provided a frame of reference for SOA migration categorizing the migration approaches with respect to activities carried out and knowledge elements used or produced.

To gain an understanding on how industrial practice perceives SOA migration, we further conducted an industrial survey in seven SOA solution provider companies. Results showed that the industrial migration approaches are considerably different from the academic ones. The differences between academic approaches and industrial ones motivated us to seek for a deeper understanding of industrial migration approaches. By further analyzing the results of the interview survey, we generalized the practice of industrial migration into a Lean & Mean SOA migration approach.

This thesis presents the Lean & Mean approach as a general tool to guide and steer migration projects. The essence of this approach is that the core elements that are repeating in SOA migration are separated from the project-specific ones and the advanced needs of certain projects are supported as an extension to the core. We applied the Lean & Mean SOA migration approach in two industrial studies. The usage implications of the Lean & Mean revealed the following ways in which this approach guides migration. Firstly, the core guides determining “what knowledge has to be made available” and “what activities needs to be carried
out”. Secondly, the extensions to the core guide practitioners in dealing with more context- or project-specific problems or needs. Using the two industrial studies we devised two extensions for the Lean & Mean approach: (i) Extension for practice reuse, and (ii) Extension for dealing with change. In this way, we addressed two main problems of industrial practice related to SOA migration: (i) how to reuse past experience, (ii) how to deal with changes during migration. Finally, the Lean & Mean approach guides practitioners reasoning in migration decision making.

Last but not least, this thesis has shown that the combination of knowledge management and SOA migration is particularly helpful to provide necessary foundation for guiding migration decision making. Such combination led us to identify typical types of knowledge that shape and drive the migration, and address certain challenges and issues in SOA migration using knowledge management practices. While in this research the first steps towards enriching SOA migration with knowledge management practices are taken, further research is needed to fully bring the advancements of knowledge management discipline to SOA migration.