English Summary

A networked software development effort is any software development effort that is carried out through a network of multiple, heterogeneous organizations. For example, projects being developed within open-source forges are instances of networked software development. Similarly, Global Software Engineering efforts that are carried out remotely by means of digital networks connecting multiple organizations are instances of networked software development. The constant behind a networked software development scenario is the emergence of development communities. A social community is a social network across which certain conditions and organizational/social arrangements are constantly true, either explicitly (i.e. enforced by a managing body) or by emergence (e.g. as a consequence of contextual conditions and other emerging relations). For example, an open-source community generated by school buddies is different than a rigid framework-based workgroup. The organizational-social structures for both social communities will have their own peculiar characteristics. These likely correspond to multiple community characteristics, yielding multiple community types and the corresponding relations.

In real-life industrial development scenarios, community boundaries, their characteristics and type during software development are often blurry if not hidden. Producing software better within networked software development, means researching the Organizational-Social Structure (OSS) behind networked software development communities, as well as the means to support their key characteristics. An OSS is the set of interactions, patterned relations and social arrangements emerging between individuals part of the same endeavour.

This dissertation offers the state-of-the-art in OSSs, and discusses mechanisms to support OSS-related decisions in software engineering. First, The dissertation presents decision mechanisms (i.e., a decision-tree and a method to apply it in practice) to establish observable OSS types and their key characteristics. Then, the dissertation presents representation mechanisms for captured types and characteristics that allow for further analysis. This representation is based on the Service-Networks formalism (SN). Finally, the dissertation discusses a tool prototype, called HYDRA, capable of harnessing an SN-based representations of observable organizations and analyse it to support decisions concerning its evolution.