

Integration of Smart Grid Technologies by Electrical Utilities; Patterns, Motivations, Challenges, Success Factors, Practices and Influence of the Field

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The energy culture as a whole and electric industry in specific is going through wide-scale disruptive and consequential transformation. The pressure for these changes come from three different fronts: environmental sustainability (preserving natural resources and using renewables), customer expectations (demand for accessible, affordable high quality electricity) and energy security. (Energy Trilemma, Energy Council, 2015).

Over the last decade, in response to these challenges, utilities were continuously adopting **smart grid** technologies (mostly Advanced Metering Infrastructure (AMI) and enterprise-wide applications). Now, utilities' focus has shifted toward developing new services and business capabilities by integrating adopted technologies on both sides of the meter. The real value (economic and social) for utilities directly depends on the successful integration of these technologies. Considering multi-dimension nature of the integration, (systems, processes, practices, standards, and policies), that makes integration highly critical, while extremely difficult and challenging. **That is why integration at the smart grid is the topic of this research.**

The theoretical foundation is drawn from three research communities; computer-based information systems (IS), sociotechnical perspectives (infrastructure studies) and organizational theories (theory of the fields).

The proposed research seek to investigate (a) patterns of Integration of smart grid technologies by electrical utilities, motivations, challenges, and success factors, (b) practices that influences of technology integration, and (c) the Influence of the organizational field.

As a phenomenology-oriented research, I will adopt multiple comparative case studies, using interviews and archival data as data collection methods to investigate the phenomenon. The case studies will be used for theory development; unpacking the theory constructs and their relationships.

The expected contribution of this research are two folded: (1) theoretical contribution; on expanding the understanding of the phenomenon of technology integration, and (2) practical contribution; offering empirical evidences to be used for practical guidelines and frameworks for practitioners, managers, system designers, developers and policy makers.