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Motivation An increasing portion of our economic activities is supported via business service engagements. Managing such service engagements is challenging: not only are the participating organizations autonomous and their information systems heterogeneous, but also the underlying requirements evolve continually. My long-term research goal is developing effective techniques for modeling, analyzing, and enacting such service engagements.

Philosophy Research is of two main styles: revolutionary and evolutionary. The former offers greater impact but with higher risk, the latter narrower impact but with lower risk. Evolutionary research has more immediate paybacks, but can get stuck in "local" optima. Revolutionary research can reach across such local optima, but without appropriate backing from evolutionary work, may remain largely inaccessible to the society. Thus, both styles are essential for a research effort to be truly successful. I intend to pursue both styles of research, following my revolutionary research with evolutionary work, even as I seek revolutionary advances on new problems.

Contributions My work contributes to the revolutionary direction of business protocols as abstractions for modeling business service engagements (TSE'05; PhD dissertation). I advocate a two-fold shift in focus: a focus on *interactions* instead of activities as building blocks, and a focus on *business-level* instead of purely flow-level or data-level semantics.

However, for business protocols to be widely adopted and have a high impact presupposes significant evolutionary work on tools, techniques, and methodologies. Accordingly, I have formalized modular business protocols via a business-level abstraction of commitments (AAAI'07b). Also, a technique for composing such modular protocols enables us to model business processes involving several protocols (AAAI'07a). Further, I have studied the effectiveness of protocol composition in accommodating changes in the models due to evolving requirements (SCC'06—best student paper). To aid practitioners in applying the above techniques, I developed Amoeba—a methodology to support the above activities (submitted to TOSEM).

I have sought industry collaborations to evaluate my research and to create opportunities for the eventual adoption of business protocols. I participated in a joint effort with TWIST (a finance industry consortium developing foreign exchange process standards) to apply business protocols to TWIST processes, evaluate their efficacy, and explore the possibilities of their adoption (SCC'07). I also advised TWIST on the evaluation of emerging choreography standards WS-CDL and ebXML business process (ebBP) with respect to foreign exchange needs.

A well-rounded perspective leads to research that is scientifically relevant and appealing to a broad community. I have made a conscious attempt to widen my perspective. A systems background (JPDC'04; ICDCS'03; MS thesis) complements my current focus on business-level challenges. My internship experiences at the IBM TJ Watson Research Center (summers of '03, '05, '06) have greatly exposed me to the challenges and methods of industrial research. I contributed to the support for different transaction styles in BPEL (the de facto standard languages for business processes today) via advertising and matching of declarative policy assertions (DKE'04). I built a tool that supports the automatic model-driven development (as in MDA) of business solutions. I participated in the development of a community platform where services can be exchanged (SEM'06; DEST'07, US Patent), and enhanced it with a domain-specific language for engineering and sharing services mashups (ICSOC'07). These internships strengthen my credentials for carrying out evolutionary research. These experiences have uniquely shaped my perspective.

Future Directions In collaboration with my future colleagues, I intend to establish a program of research in the exciting area of the science of business service engagements. Let me describe two specific research directions, which will not only build upon my past work but introduce new insights from fields such as software engineering, artificial intelligence, semantic modeling, management, risk analysis, and economics.

Contractual relationships among business partners form the basis of the business service engagements. The engagements may create, modify, or fulfill the contractual obligations outlined in the terms and conditions of the contracts. Real-life contracts tend to be complex. In current practice, contracts are often designed by hand and adopted by their participants after only a manual analysis. Thus, a method to check whether the contract is safe for an organization to participate in is needed. I plan to develop a framework for checking various correctness properties of business contracts. A basic framework is in place and is accepted with exceptional reviews: overall scores of 8/10, 9/10, and 9/10 at AAMAS'08.

A crucial aspect of business service engagements is the structure of the participating organizations. The success of service engagements depends as much on how well the organizations interact as on how well they are structured to manage their responsibilities. Organizations not only proactively manage their commitments to others but also others' commitments to them via assigning responsibilities to various roles. Checking whether the responsibility structure of an organization is attuned to its engagements is important. I plan to develop a framework for checking various structural properties of organizations.

My professional goal is to play a leading role in shaping the emerging, interdisciplinary area of services science by making lasting technical contributions.