I. Research Overview and Outcome

BACKGROUND

- The widespread diffusion of Web services and SOA is raising interest for SOA-based implementation of life and mission-critical applications for which reliability is a crucial requirement.
- In Service-Oriented Architectures (SOAs), the mechanism for run-time discovery and selection of services may conflict with the need to make sure that business process instances satisfy their reliability requirements.
- We believe the best approach for building reliable services is to incorporate reliability in every phase of the system design and throughout the entire software development life cycle using reliability patterns.
- Reliability patterns support widespread application of best practices and best solutions, and offer an effective guideline for software developers that may not have expert knowledge and experience in reliable system development.
- Specifically, a reliability pattern consists of several parts which provide a detailed description of the patterns’ objective and serves as a tangible reference for an effective reliability solution.
- A pattern is an encapsulated solution to recurrent software or system problems in a given context, and it can be described using UML diagrams.
- Once a system is built using some methodology that uses reliability patterns, it is important to show how it has reached a given level of reliability.
- In a SOA environment we can go even further, we can certify that the services satisfy some standards of reliability making digitally signed information available at runtime.

OBJECTIVE

- To define an approach for certifying reliable services using reliability patterns.
- To increase the reliability of critical services.

PROBLEM

- Challenges in software reliability not only stem from the size, complexity, difficulty, and novelty of software applications in various domains, but also relate to the knowledge, training, and experience of the software engineers involved.
- The SOA paradigm which supports runtime selection and composition of services, makes it difficult to guarantee the reliability of a process instance.
- “How to certify the level of reliability of a Web Service?”

II. International Experience

ITALY

My experience was absolutely phenomenal. I went to Italy alone which challenged me to step outside of my comfort zone in many respects. I surprised myself by exploring Italy on my own as a lone female. I enjoyed the cuisine, daily life style and language too much.

The PIRE program gave me the opportunity to conduct collaborative research that allowed me to progress significantly with my PhD research. I was able to develop and hone my previous research skills and this allowed me to progress significantly with my research goals. It also allowed me to bridge cultural gaps and develop camaraderie among international peers with the added benefit of experiencing a new culture and customs. The union formed from this collaboration is priceless and will continue to appreciate in my future academic endeavors.

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