inContext
Unleash Team Power

INCONTEXT

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National University of Ireland, Galway – DERI (IR)
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OBJECTIVES

Knowledge workers are increasingly engaged in various projects at the same time requiring flexible collaboration. New team forms emerge that feature dynamic interaction patterns currently unsupported by existing software services. Teams of virtual, nimble, or mobile/nomadic kind evolve and merge to reflect the vibrant nature of human interaction.

To enable efficient collaboration amongst team members and effective participation of individuals in multiple teams at the same time, collaboration environments need to exhibit capabilities for large-scale interaction, peer-to-peer communication, and loose coupling in a trusted serviced-oriented way.

inContext strives to enable dynamic collaboration by exploring new techniques and algorithms for pro-active service aggregation, context-aware service adaptation and service provisioning.

inContext's contribution will be twofold. On the one hand, new techniques and algorithms for mining human-to-human and human-to-service interaction patterns provide the foundation for providing relevant services at the right place and time. On the other hand, a new generation of services no longer merely reacts to changes in a collaborative environment but anticipates transitions and adapts accordingly. To this end, relevance-based context representation models and methods for context-coupling and enrichment allow for autonomic service adaptation and provisioning.

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The focus of the project lies in four key innovation areas

Dynamic interaction patterns: mining and algorithms.

As dynamic interaction processes cannot be determined in advance and should not be restricted by rigid workflow models, a set of interaction patterns are investigated to be applied on the fly. Analyzing conversations and information flow of intra- and inter-team collaboration will reveal the underlying work patterns to identify best practices.

Context representation, transformation models and reasoning techniques.

Services need to be context-aware to provide the relevant functionality at the right place and time.

Thus, suitable formalization and representation techniques will allow modelling of context in highly dynamic collaborative environments. Transformation models reflect a team's transition from one form to another and context reasoning techniques enable contextual knowledge extraction from existing information.

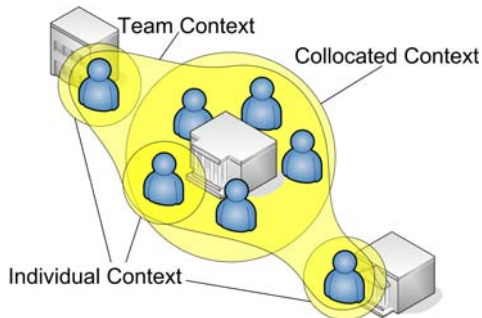*Relevance-based trusted context service provisioning techniques.*

Based on a context model, new algorithms can select relevant services already in advance resulting in pervasive collaboration services. Amongst other requirements, such a model needs allowing for formalizing relevant context types under certain conditions. Hence, a reliable set of suitable services constitutes the basis for autonomic service adaptation and aggregation.

Figure 1: Identified Context Scopes

Autonomic service adaptation: Context learning, coupling, and enrichment.

Algorithms aimed at context learning empower services to recognize situations, artefacts, roles, people and places. They are bundled with situation-aware mining techniques to extract the relevant context information. In addition, context is coupled with time and location constraints to improve these algorithms, while combination of individual and team contexts enriches the overall service provisioning process.
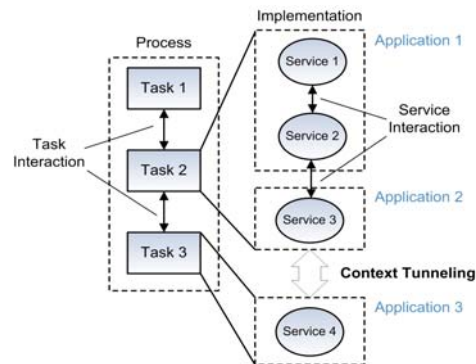
Figure 2: Work activities (tasks) are mapped to services embedded in applications. Context Tunneling enables context transfer between applications across tasks.

IMPACT AND EXPLOITATION

inContext will have a significant impact on businesses as knowledge workers greatly increase their efficiency and effectiveness through better integration and improved quality of teamwork.

Furthermore, process awareness enables organizations to improve their risk assessment and management possibilities. Increased flexibility of ad hoc processes empowers a large section of the society to create virtual organizations and communities.

Relevant service provisioning reduces time-to-team and time-to-work while increasing productivity because of fewer irrelevant interruptions. Furthermore, identified best practices and on-going work pattern monitoring support dynamic collaboration.

Finally, the Pervasive Collaboration Services Reference Architecture serves as a tested and foundation for further projects and prospective products.