MEMORIA TÉCNICA PARA PROYECTOS TIPO A o B

SUMMARY OF THE PROPOSAL

PRINCIPAL INVESTIGATOR: **Ernesto Pimentel Sánchez**

PROJECT TITLE:

SOFIA: Service Optimization and Orchestration in the Future Internet Applications

SUMMARY:
(brief and precise, outlining only the most relevant topics and the proposed objectives)

Our daily life has changed thanks to Web services, being social networks and smartphones the most recent examples. Nonetheless, even though services are potentially interconnected and ubiquitously accessible, their synergies are not exploited due to market fragmentation, incompatibility and bugs which naturally creep into products of certain complexity. The main goal of this proposal is to create a platform to support the development of orchestrators of Cloud services. The development process focusses on the optimization and certification of such orchestrators. Both the platform and the developed service orchestrators (which are also services themselves) will be accessible from mobile devices and will be tailored to their physical resources (memory, network, energy, etc.) and to the orchestrated Web services (Web applications and social networks). This platform will extend traditional software development environments both by the added-value provided by the services offered in the Clouds and by the generation of optimal and reliable services by means of formal methods. The synthesized services and orchestrators will be accessible through an intuitive interface based on the abstract models corresponding to the services. To fulfill such goal, the platform will be built in three modules or layers. In the first step, performance and QoS in general will be monitorized and analyzed in order to offer optimal services, spending the fewest resources at the lowest cost. This analysis will support a second layer in charge of synthesizing dynamic orchestrators. These orchestrators could evolve over run time to adapt themselves to changes in context (due to the mobile device, user preferences or their environment). This evolution will empower the discovery, adaptability and reconfiguration of services. Finally, on the third layer of the platform, functional and non-functional properties will be verified during the synthesis process, both statically and at runtime, by means of different formal techniques (both considering discrete systems, hybrid systems, or stocastic ones).