



Being stuck with ages-old software is a constant headache for businesses. It's clunky, old fashioned, expensive to run and never quite works like it should.

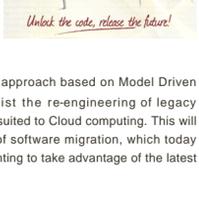
Now a team of developers from across Europe think they have the answer...

Introduction

Dear readers,
We are very glad to introduce you the first newsletter of the ARTIST project

ARTIST is a European project, which is developing a set of methods, tools and techniques to facilitate the transformation of legacy software assets to a Cloud-based delivery model. The constant improvements to the speed, geographical coverage and reliability of Internet connections have increased the appeal of Cloud-based solutions. Traditional software solutions and service providers must adapt to the new reality of the Cloud, without disrupting the business continuity of their existing customers.

Given this need to support the evolution of the software and migrate it to the new service provision environment, companies must make a decision about whether to migrate their solutions, in which significant investments have been made, or to start from scratch, accepting the difficulty involved in calculating the cost of both options. Moreover, they must do so in a market where the Time to Market for products and services is critical.



ARTIST provides a software modernisation approach based on Model Driven Engineering techniques in order to assist the re-engineering of legacy applications to platform independent models suited to Cloud computing. This will significantly reduce the risk, time and cost of software migration, which today represent major barriers for organisations wanting to take advantage of the latest Cloud-based technologies.

The ARTIST project will continue until September 2015, delivering a toolset to assess, plan, design, implement and validate the assisted migration of legacy software to Software-as-a-Service. There are plans to create a repository for reusable components (models and transformations), a validation framework and a certification model for migrated applications. Through our web site and this periodic Newsletter we will keep you informed about our progress.

Thank for your interest in our work
The ARTIST consortium

The ARTIST concept

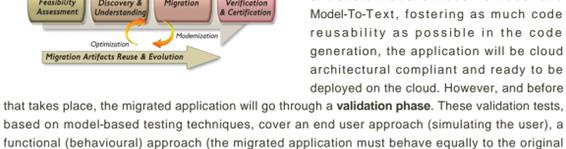
As introduced above, the ARTIST approach covers the whole migration cycle, from a feasibility analysis until the software is provided as a service and in three axis, technology, business and organizational processes.

The **pre-migration phase** consists on a maturity assessment and a technical and business feasibility analysis. The maturity assessment (MAT) results on the application characterization in terms of technology and business as well as on a set of non-functional migration goals. The technical feasibility assessment (TFT) studies the source code, obtaining metrics such as code coupling, reusability degree (and components), and a high level design following an MDE approach that end up with a detailed list of proposed migration tasks and their associated effort. The Business Feasibility Analysis (BFT) analyses not only the ROI of tackling a migration project but also the impact of such migration project in the business processes of the company and in the whole enterprise of the ecosystem providing a simulation of the metrics over time.

The pre-migration phase results in a "go – no go" decision. If the decision is a go, based on the analyses performed in the pre-migration phase, the user will receive a customized methodology for its own project. ARTIST aims to create a generic methodology that will be customized, automatically, for each migration project through the creation of a methodology framework that will be provided as an Eclipse EPF plug-in, following the SPEM2.0 standard. This customized methodology will guide the user in all aspects of the migration, technical and business (in cloud computing these aspects they are so intertwined that one cannot be addressed without the other) as well as processes. For the technical approach, ARTIST is following a model-driven one. This starts off with a **reverse engineering step**, where the code models are first discovered and then understood, that is, going from a platform specific view to a platform independent. These activities will also be supported by means of an Eclipse plug – in, compliant with OMG standards such as KDM and UML.



In the context of ARTIST, Cloud providers (IaaS and PaaS) are being benchmarked. Unlike current benchmarks that focus only on performance characteristics, the **ARTIST benchmark** will cover other aspects such as platform and configuration features, and third party services provision. These data will serve as instances of the **metamodels** created for IaaS and PaaS using the CloudML languages.



Once the application has been reverse engineered and the platform selected, the **forward engineering phase starts**. By means of transformations Model-To-Model and Model-To-Text, fostering as much code reusability as possible in the code generation, the application will be cloud architectural compliant and ready to be deployed on the cloud. However, and before that takes place, the migrated application will go through a **validation phase**. These validation tests, based on model-based testing techniques, cover an end user approach (simulating the user), a functional (behavioural) approach (the migrated application must behave equally to the original application) and a non-functional approach, comparing the tests results with the migration goals, modelled with the π^* notation, determined in the pre-migration phase. The test results will result in the application of optimization patterns, at architectural level, in order to solve possible bottlenecks issues.

The final step of the ARTIST process is the **certification** of the migrated application also in three axis, technology, administrative aspects (business sustainability) and organizational processes. The aim of this certification model, which will be offered as a service, is the generation of trust in the end consumer of SaaS applications with the ultimate goal of encouraging the uptake of cloud computing in the European society.

For more information [click here](#)

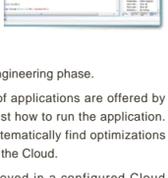
What is in store for you?

ARTIST is about dealing with existing software modernization. The required first phase of obtaining useful higher-level representations of such (legacy) software is commonly called reverse engineering (RE), and remains today a major challenge to be tackled. In the context of ARTIST, we are promoting a **model driven reverse engineering (MDRE) approach** relying on two main consecutive sets:

- **Model Discovery** which consists in automatically producing initial (low-level) models from the various artifacts composing the software (e.g. source code, configuration files, data files, etc.);
- **Model Understanding** which allows obtaining, from the previously discovered models, the needed models describing the system in such a way that the next Forward Engineering phase can be performed efficiently.

The main benefits of following such an approach is twofold: 1) the use of the well-known and largely spread UML OMG standard for sharing models (notably with Forward Engineering) permits an interesting **genericity** (concerning the type of legacy potentially supported) and **extensibility** (concerning the type of information to be extracted and represented), 2) the possible use of the KDM OMG standard as a pivot intermediate representation (even if not strictly mandatory) provides significant **reusability** capabilities (e.g.; capitalization on some transformation components upon several different legacy technologies).

After the reverse engineering phase, the forward engineering phase aims at the optimization of the legacy applications in order to run their improved versions effectively and efficiently in the Cloud environments. As for the reverse engineering, we employ model driven techniques to support the user in the forward engineering phase:



- **Cloud provider selection:** As a first step, the potential Cloud providers have to be examined and the most promising one has to be selected. This step is supported by matching Cloud provider profiles with the application models produced in the reverse engineering phase.
- **Application adaptation:** Several possibilities for the optimization of applications are offered by Cloud providers, but at the same time, also some restrictions may exist how to run the application. For dealing with these issues, model transformations are used to systematically find optimizations and restrictions as well as to prepare the applications to be executed in the Cloud.
- **Application deployment:** Finally, the application has to be deployed in a configured Cloud environment-the different components have to be distributed and assigned to certain Cloud services. To support this step, we develop transformations that first explore the possible deployment strategies and second achieve the actual provisioning of the application in the Cloud.

The main benefits of the forward engineering approach are the following. First, reuse of existing knowledge for selecting potential Cloud providers as well as for improving and running the existing applications in the Cloud is achieved. Second, by having models for Cloud providers including their capabilities and restrictions, for the configuration of Cloud environments, and for the deployment of the application allows to move to the Cloud and between Cloud providers in the future more easily.

How to put ARTIST in place?

ARTIST aims at positioning itself in the Industrial community, simplifying dramatically the migration of legacy industrial ICT services and applications towards the Cloud paradigm. A significant number of cross-sector industrial companies own or use legacy ICT services and applications whose reasonable evolution in the short term, in the current ICT frame, is to be migrated to the Cloud, not only to obtain the benefits and advantages of the Cloud features, but also to be competitive in the current ICT market. ARTIST offers to those companies that, having assumed the need of shifting their ICT assets towards the Cloud, want to keep their original investment as much as possible, by reusing the legacy assets.

With this aim in context, ARTIST will be evaluated by real-world case studies, developed by some ARTIST industrial partners, in the context of the migration to the Cloud of selected commercial ICT assets. A total of four industrial cases (representing a wider range of industrial sectors where ICT dependency is significant) will early drive the ARTIST objectives by posing real-world migration requirements and will evaluate ARTIST results achieved against their migration needs. The rationale behind the selection of the cases is mainly based on these criteria: (i) to represent a significant variety of application domains, such as e-government, media asset management, social business or natural disaster management systems, (ii) to represent computation and data intensive applications that show significant peaks in resource consumption, (iii) to embrace the most relevant software technologies including Java and .Net, (iv) to adopt most common desktop versus webtop client-server architectures or (v) to support partial versus complete migration projects.

The four ARTIST industrial cases can be summarized briefly as follows.

The Distant Early Warning System (DEWS)

provided by ATOS, is a distributed early warning disaster management system which requires real-time processing of information from a multi-sensor network to support decision making in natural disaster management. ARTIST addresses the challenge of the MDE driven redesign the architecture of the DEWS CCUI (Command-Control User Interface), from a Desktop-based Eclipse RCP application into a Cloud-deployable Webtop-based client-server application, which benefits of Cloud dynamic elasticity, ubiquitous and multi-device access and simplified evolutionary maintenance. DEWS use case will focus on the assessment of Reverse and Forward Engineering ARTIST techniques supporting an architecture paradigm change and in the provisioning of reusable artefacts that enables to automate the migration of other legacy desktop applications built upon the same very popular community Open Source Java frameworks.

The Public System for Cooperation (SPCoop)

provided by Engineering, lets its users to have a unified view on services of the Italian public administration, both central and local, such as public registration, taxation management or fuel price monitoring. SPCoop integrates both the processes and data involving different public administration services. ARTIST will ease SPCoop to benefit of the economies of Cloud scale, enabling to offer common eGovernment SPCoop services as a platform (PaaS) for the development of new applications, reducing the risk and costs of such migration.

NewsAsset

developed by ATC, is a media asset management solution for news agencies, broadcasters or publishers. NEWSASSET is a data intensive Java application managing news content such as text, images, audio or video. NEWSASSET use case will address some challenges motivating its migration into the Cloud, such as (i) archiving news and media content based on cloud datastores, (ii) elastic support for occasional peaks in user demand, (iii) access to highly geographically distributed data. NEWSASSET will benefit of Cloud elastic management, ubiquitous access, simplified evolutionary maintenance (fast deployment) and SaaS support.

UbiSoN

developed by Spikes, is a .NET social collaboration enablement facility targeting environments that have a rich real-time context. ARTIST will allow the application of UbiSoN as a smart Social Networking service to legacy applications "in situ" or through partial migration. That is, UbiSoN is a testbed for high potential partial migration and "model grafted" service extension and renovation. UbiSoN case test focus on ability for "deep" integration, not just API consumption, including pattern based model discovery, generation of event detection and interception artefacts. It provides reusable RE and FE artefacts, focusing on popular framework and data patterns in the .NET environment.

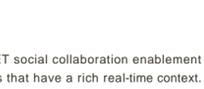
Did you know that?

ARTIST has already published four articles to scientific journals and conferences, participated in several events and organized collaboration activities.

Publications
Among ARTIST publications, one could distinguish the one that was released in the proceedings of the 17th European Conference on Software Maintenance and Reengineering (CSMR). It was the outcome of a joint activity that all the partners of the consortium participated.

For more information about ARTIST publications, please [click here](#)

Events
ARTIST has already participated in more than five relevant events, succeeding in raising the awareness of the project not only to all its relevant stakeholders, but to the scientific and industrial communities as well.



For more information about ARTIST related events, please [click here](#)

Where to look next

ARTIST will be presented at following events in 2013:

7th Advanced School on Service Oriented Computing (**SummerSQC**), 1-6th July 2013, Crete (Greece)

European Conference on Service-Oriented and Cloud Computing (**ESOCC**), 11-13th Sep 2013, Málaga (Spain)

Workshop **MICAS 2013**: Management of resources and services in Cloud and Sky computing, 23-24th Sep 2013, Timisoara (Romania)



ICT Event, 6-8th Nov 2013, Vilnius (Lithuania)

Do you want to be part of it or know about it

Register with our newsletter through the website (www.artist-project.eu), contact us in clara.pezuola@atos.net or:

Follow ARTIST on Twitter

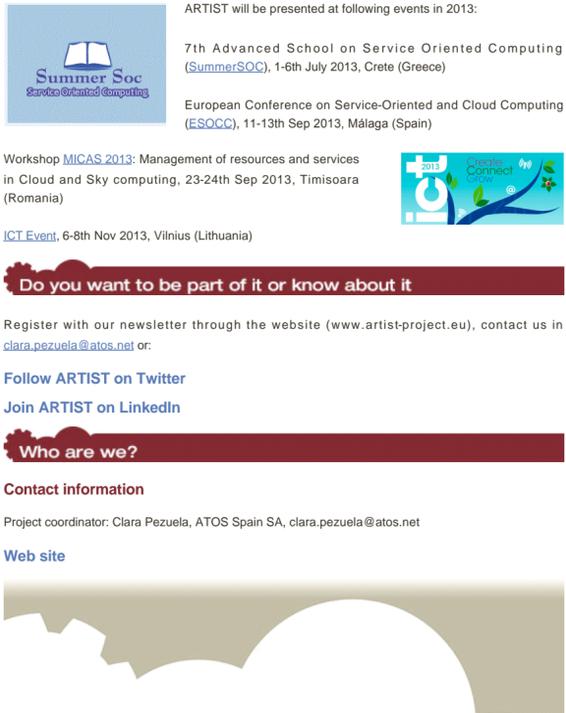
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Who are we?

Contact information

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Web site



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