

DOSSIER-Cloud

DEVOPS-BASED SOFTWARE ENGINEERING FOR THE CLOUD

<http://www.dossier-cloud.eu>



Deliverable D2.2

DevOps oriented software engineering discussions' minutes and notes

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3.0	28/12/16	Andreas Christoforou	Second review
4.0	10/01/17	Andreas Andreou	Third review
5.0	17/01/17	Andreas Christoforou	Second review
6.0	19/01/17	Andreas Andreou	Final review and corrections

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1. Introduction

1.1 Purpose

This document quotes minutes and notes from various meetings that have taken place in the context of site visits, workshops and schools. In these meetings researchers from the University of Tilburg (UvT), Politecnico di Milano (POLIMI) and the Cyprus University of Technology (CUT) met, discussed and exchanged research ideas.

This deliverable is part of Work Package 2 (WP2) that describes the actions to enable a successful transfer of knowledge from the leading institutions to CUT and for luxuriating its knowledge based on technical issues of the Cloud computing environment and distributed software services, DevOps principles and workflows. Furthermore, WP2 is involved with enabling the collaboration and communication in DevOps environments, the motivation, leadership and risk in DevOps teams, and aims to gain expertise on open source tools and reuse of existing open source modules.

1.2 Definitions, Acronyms, and Abbreviations

CUT: Cyprus University of Technology

UvT: University of Tilburg

POLIMI: Politecnico di Milano

1.3 Overview

The rest of the document is structured as follows: In Section 2 minutes and notes from the first site visit at the Politecnico di Milano (POLIMI) are quoted, while Section 3 presents minutes and notes from the POLIMI workshop. Section 4 presents the minutes and notes from the second site visit at UvT and Section 5 describes the first mini school (part A and part B) that took place at CUT. Finally, Section 6 concludes the document.

2. POLIMI First Site Visit series (February 18 – March 12, 2016)

During the first series of site visits, members from the CUT group attended a number of presentations given by the POLIMI group related to software development and deployment for distributed applications. In particular, the main subject of these presentations was to deal with self-adaptation of cloud applications, formalization and identification in cloud-workload specifications, software verification and analysis of incomplete models designed in software development.

The most significant notes and minutes of the meetings that took place during this visit are given below:

Workpackage:	WP2 – New software process for developing and operating distributed applications		
Date: (MM/DD/YYYY)	19/02/2016	Time:	14:30-16:30
Facilitator/Presenter:	All	Location:	III floor, building 22, via Golgi, 42, Milan, Italy

1. Subject / Short Description

Open Discussion - Cloud Reconfiguration Research Paper

2. Attendees

Name	Department/Division	E-mail	Phone
Prof.Carlo Ghezzi	POLIMI / Italy	carlo.ghezzi@polimi.it	
Christos Tsigkanos, PhD candidate	POLIMI / Italy	christos.tsigkanos@polimi.it	
Alessandro M. Rizzi, PhD candidate	POLIMI / Italy	alessandromaria.rizzi@polimi.it	
Claudio Menghi, Postdoctoral student	POLIMI / Italy	menghi@elet.polimi.it	

Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Constantinos Stylianou, PhD candidate	CUT / Cyprus	cstylianou@cs.ucy.ac.cy	
Andreas Christoforou, PhD candidate	CUT / Cyprus	xristofo@gmail.com	

3. Discussion notes		
Topic and targets	Introducer	Time
<ol style="list-style-type: none"> 1. Motivation - Problem statement 2. Problem description <ol style="list-style-type: none"> a. Configuration parameters of the Cloud infrastructure b. Software Requirements and SLAs <ol style="list-style-type: none"> i. Performance ii. Workload iii. Security iv. Elasticity 3. Research Questions <ol style="list-style-type: none"> a. Correctness of model output b. Elasticity <ol style="list-style-type: none"> i. Servicing ii. Pricing c. Scalability d. Competitiveness (against other known models, e.g. Frey et al. 2013) 4. Modelling <ol style="list-style-type: none"> a. Inputs: <ol style="list-style-type: none"> i. Parameters to model ii. Metrics and measurement processes <ul style="list-style-type: none"> • Workload • Cost • SLA terms • Other? b. Outputs <ol style="list-style-type: none"> i. Vertical scaling ii. Horizontal scaling 5. Multi objective optimization <ol style="list-style-type: none"> a. Definition of the optimization problem (fitness 	Andreas Andreou	

functions, constraints) b. Description of GA model (chromosome, genes, operators) c. Selection of MOGAs: NSGA-II, MOCELL, PAES, SPEA 6. Description of datasets a. Simulated data i. Cloud environment descriptions <ul style="list-style-type: none"> • MS-Azure • Amazon EC2 • Eucalyptus b. Real-world data i. POLIMI ii. CUT iii. Supernova? 7. Simulations and experiments a. Results (HV, IGD) b. Comparison with other models i. Repetition of experiments, results ii. Assessment of statistical significance → Mann-Whitney test with Bonferroni correction 8. Closing and Conclusions		
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3. Milano Workshop (April 11-13, 2016)

Members from all institutions participated in the sessions of this workshop. During the opening session, a summary of the first series of site visits was made and then a discussion followed regarding the topics that we should concentrate on and study more.

Work package:	WP2 – New software process for developing and operating distributed applications		
Date: (MM/DD/YYYY)	11/04/2016	Time:	09:30-11:30
Facilitator/Presenter:	Andreas Andreou	Location:	III floor, building 22, via Golgi, 42, Milan, Italy

1. Subject / Short Description

Project Meeting – Project Management.

Four 2-day visits in February/March 2016. A total of 22 talks presented. 19 talks were presented from POLIMI 3 from CUT. The areas that were covered include: Self-adaptive systems, Cloud resource management, Cloud pricing plans Social software engineering

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Luciano Baresi	POLIMI / Italy	luciano.baresi@polimi.it	
Prof. Garlo Ghezzi	POLIMI / Italy	carlo.ghezzi@polimi.it	
Prof. Mike Papazoglou	UvT / Netherlands	mike@uvt.nl	
Prof. Willem-Jan van den Heuvel	UvT / Netherlands	wjheuvel@uvt.nl	
Prof. Arjan van den Born	UvT / Netherlands	J.A.vdnBorn@uvt.nl	
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Prof. Sotirios Chatzis	CUT / Cyprus	sotirios.chatzis@cut.ac.cy	
Constantinos Stylianou, PhD candidate	CUT / Cyprus	cstylianou@cs.ucy.ac.cy	
Andreas Christoforou, PhD candidate	CUT / Cyprus	xristofo@gmail.com	

3. Discussion notes

Topic and targets	Introducer	Time
<ol style="list-style-type: none">1. Money transfer completed2. Consortium agreement → original signatures3. Lessons learned from the first series of site-visits<ol style="list-style-type: none">a. Strong points<ol style="list-style-type: none">i. Scientific areas and subjects with promising	Andreas Andreou, Andreas Christoforou	

<p>aspects and fertile ground for research collaboration</p> <ul style="list-style-type: none"> ii. Warm welcome and very positive attitude by all members and all groups (thank you!) iii. Complementary nature of scientific/research expertise and/or Cloud infrastructure iv. Work together and write papers in a short and medium term horizon v. Collaborate towards building a new or connecting existing infrastructure towards a hybrid, inter-university Cloud vi. Write some proposals, H2020, Coordination and Collaboration, Security, etc. seeking funding either for applied research, or for setting/expanding our infrastructure, or for collecting experimental data and delivering benchmarks to the scientific community (strong need for that!) <p>b. Weaknesses</p> <ul style="list-style-type: none"> i. Time constraints and other obligations (e.g. deadlines for conferences, proposals, etc.) → Consequence: Difficulties in setting the dates/time slots for events → Late finalization of agendas → Not the right people participate in specific events or talks. ii. Lack of (enough) empirical data iii. Need for stronger links with local industry (CY, IT) iv. The subjects of the talk/discussions during the site visits were not so aligned with proposal's KPIs → This is acceptable due to technology and research focus shift <p>c. Ways to tackle weaknesses</p> <ul style="list-style-type: none"> i. Try to agree on dates for upcoming visits and agendas (subjects) as far ahead as possible ii. Stick to the basic KPIs: DevOps/SE, Automations (configuration, resource management), Metrics, Industrial Involvement iii. Make some preparatory activities for disseminating the project to potential stakeholders (CY for example has sent a newsletter to every IT oriented company 		
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<p>through their professional body representative)</p> <p>iv. Collect data! Funding?</p> <p>4. Next steps and pending issues</p> <p>a. Stakeholders event #1 in Italy</p> <p>b. 1st site visit in Tilburg → 4 visits: dates?</p> <p>c. Summer school in Cyprus → was scheduled for August. Need to move it to September? Suggestions for its structure?</p> <p>5. Logistics</p> <p>a. Timesheets (template): Letter from EU related to eligibility of expenses</p> <p>b. Declaration of effort → Planner for effort distribution CUT and Univ. of Tilburg. Milan? Consistency</p> <p>6. Closing Remarks</p>		
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Workpackage:	WP2 – New software process for developing and operating distributed applications		
Date: (MM/DD/YYYY)	11/04/2016	Time:	09:30-11:30
Facilitator/Presenter:	Andreas Andreou	Location:	III floor, building 22, via Golgi, 42, Milan, Italy

1. Subject / Short Description

Project Meeting – First Site Visits Overview – Research Collaboration

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Luciano Baresi	POLIMI / Italy	luciano.baresi@polimi.it	
Prof. Garlo Ghezzi	POLIMI / Italy	carlo.ghezzi@polimi.it	

Prof. Mike Papazoglou	UvT / Netherlands	mike@uvt.nl	
Prof. Willem-Jan van den Heuvel	UvT / Netherlands	wjheuvel@uvt.nl	
Prof. Arjan van den Born	UvT / Netherlands	J.A.vdnBorn@uvt.nl	
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Prof. Sotirios Chatzis	CUT / Cyprus	sotirios.chatzis@cut.ac.cy	
Constantinos Stylianou, PhD candidate	CUT / Cyprus	cstylianou@cs.ucy.ac.cy	
Andreas Christoforou, PhD candidate	CUT / Cyprus	xristofo@gmail.com	

3. Discussion notes		
Topic and targets	Introducer	Time
<ul style="list-style-type: none"> Spend the first year for identifying research topics of interest in collaboration with the other partners. Priority is based on significance, research impact, need for doing it, difficulty, and so on. During the second and third year we should try to implement them. CSA project action proposal: <ul style="list-style-type: none"> Collect data and produce benchmark datasets to deliver to the scientific community → check calls and deadlines Teaming → infrastructure development for CUT with the contribution and expertise of the other two Maybe merge the above two? Site-visits may last longer in the future, 2-3 weeks, as long as there will be a research topic under investigation. Summer school: <ul style="list-style-type: none"> Dates for the summer school: 5-9/9, or, 12-16/9 → Carlo is OK, cross-check with Mike. Structure of summer school: 5 days <ul style="list-style-type: none"> Morning sessions: 2 lectures, 1.5 hours each Afternoon sessions: Each day one event for local industry and stakeholders Tilburg team: 	Andreas Andreou, Andreas Christoforou	

<ul style="list-style-type: none"> ○ Interested in human resources management in DevOps environments. Collaboration with industry. Link with entrepreneurship. ○ 1st site visit: <ul style="list-style-type: none"> ▪ Sun 29/5 – Thu 2/6, or ▪ Tue 31/5 – Fri 3/6 ○ Summer school Crete, 27/6 -1/7 → check thematology; try to group together talks and presentations that match CUT's interests so that more people attend for less days. ○ Will organize some meetings there, face-to-face, with key stakeholders and industrial partners to seek collaborations and possibly some starting funding for investigating topics of their interest. ○ Data collection, open data vs confidential ● Sam and Giovanni: <ul style="list-style-type: none"> ○ Replace control theory with <ul style="list-style-type: none"> ▪ decision support models, FCMs, IDs ▪ policy gradient (Chatzis) ○ Will send us their paper (submitted to FSE) ● Danilo's team: → May 2016 <ul style="list-style-type: none"> ○ Start with synthetic data that they have ○ Simulation tool from Danilo's friend ○ MOGAs to replace their approach that uses local search and compare with their results (they will first finish and submit a paper). Ask for more details and literature (do they have papers published?). They perform some type of planning with local search and this will be substituted by our MOGAs ○ Sotiris' experiments → will first wait for Danilo to finish their experiments and submit 1 or 2 pending papers and then they will send us the scripts to extract the same data and compare with their results. ○ Metrics <ul style="list-style-type: none"> ▪ DevOps → S³ Project: European development of excellence ▪ Paper with metrics → Danilo will send it ● Raffaella's team: <ul style="list-style-type: none"> ○ Cost estimation for service development as well as maintenance (reconfiguration, enhancements, operation) and link with pricing schemes to assess whether existing customers' pricing schemes remain profitable and forecasting of workload needs for new 		
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<p>customers so that they are proposed the more suitable pricing scheme.</p> <ul style="list-style-type: none"> ○ Multi-arm bandit technique to predict workload demands for new customers so that they are proposed the more suitable pricing strategy so that it remains profitable given that circumstances change (needs from other customers, the configuration of the infrastructure, etc.) ○ Price sensitivity → take into account the dissatisfied customers who do not renew their contracts due to wrong pricing or upgrades <ul style="list-style-type: none"> • Carlo's team: <ul style="list-style-type: none"> ○ Srdjan: Traces of functional behavior. Collaboration?? ○ Link with one of their papers published in ICSE2013: Managing Non-functional uncertainty via model-driven adaptivity 		
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4. UvT First Site Visit series (June 1 - July 5, 2016)

Three members from the CUT group participated in the first series of site visits at UvT. During the visit several lectures were given that link the key knowledge areas presented in Work Package 2.

Workpackage:	WP2 – New software process for developing and operating distributed applications		
Date: (MM/DD/YYYY)	01/06/2016	Time:	15:00 -17:00
Facilitator/Presenter:	Mike P. Papazoglou	Location:	Marienburg Den Bosch

1. Subject / Short Description

Round table discussion

2. Attendees			
Name	Department/Division	E-mail	Phone
Prof. Mike P. Papazoglou	Tilburg / The Netherlands	m.p.papazoglou@uvt.nl	
Prof. Willem-Jan van den Heuvel	Tilburg / The Netherlands	w.j.a.m.vdnheuvel@tilburguniversity.edu	
Koen van der Oever	Tilburg / The Netherlands	k.f.vdnoever@tilburguniversity.edu	
Yan Wang	Tilburg / The Netherlands	y.wang13@uvt.nl	
Prof. Eric Postma	Tilburg / The Netherlands	e.o.postma@tilburguniversity.edu	
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Constantinos Stylianou, PhD candidate	CUT / Cyprus	cstylianou@cs.ucy.ac.cy	
Andreas Christoforou, PhD candidate	CUT / Cyprus	xristofo@gmail.com	

3. Discussion notes		
Topic and targets	Introducer	Time
<ul style="list-style-type: none"> Possible collaboration with FCM on maintenance and failures of systems like ITV, Telephony etc. IoT, Management of car maintenance data Data analytics for car dealers, insurance companies, OEMs etc <ul style="list-style-type: none"> We want Data to make a pilot for ML and CI models-prediction FCMs for policy making for issues that municipality interested in. Den-Bosh Municipality has data that could be shared with CUT group Collaborations I EU proposals 	Andreas Andreou, Mike Papazoglou	

Workpackage:	WP2 – New software process for developing and operating distributed applications		
Date: (MM/DD/YYYY)	02/06/2016	Time:	15:00 -17:00
Facilitator/Presenter:	Mike P. Papazoglou	Location:	Marienburg Den Bosch

1. Subject / Short Description

Round table discussion

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Mike P. Papazoglou	Tilburg / The Netherlands	m.p.papazoglou@uvt.nl	
Prof. Willem-Jan van den Heuvel	Tilburg / The Netherlands	w.j.a.m.vdnheuvel@tilburguniversity.edu	
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Constantinos Stylianou, PhD candidate	CUT / Cyprus	cstylianou@cs.ucy.ac.cy	
Andreas Christoforou, PhD candidate	CUT / Cyprus	xristofo@gmail.com	

3. Discussion notes

Topic and targets	Introducer	Time
<ul style="list-style-type: none"> - Summer school in Cyprus <ul style="list-style-type: none"> o Code/hackathon - H2020 Teaming proposal 	Andreas Andreou, Mike Papazoglou	

<ul style="list-style-type: none"> ○ Internet of Everything ○ Machine learning as a service ○ Entrepreneurship ○ Innovation as a service <ul style="list-style-type: none"> - H2020 Co-Creation call April 2017 - H2020 Co-Creation call June 2017 (Policy) 		
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Workpackage:	WP2 – New software process for developing and operating distributed applications		
Date: (MM/DD/YYYY)	03/06/2016	Time:	9:00 -12:00
Facilitator/Presenter:	Mike P. Papazoglou	Location:	Marienburg Den Bosch

1. Subject / Short Description

Informal discussion on research perspectives in the areas covered - Summary / Closing

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Mike P. Papazoglou	Tilburg / The Netherlands	m.p.papazoglou@uvt.nl	
Prof. Willem-Jan van den Heuvel	Tilburg / The Netherlands	w.j.a.m.vdnheuvel@tilburguniversity.edu	
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Constantinos Stylianou, PhD candidate	CUT / Cyprus	cstylianou@cs.ucy.ac.cy	
Andreas Christoforou, PhD candidate	CUT / Cyprus	xristofo@gmail.com	

3. Discussion notes		
Topic and targets	Introducer	Time
<ul style="list-style-type: none"> - Brainstorming Session (H2020 Teaming) - Call details - Two partners in principle (check the details and prerequisites) - We can bring associate partners in the form of "expression of interests" - Deadline in November. We have to start during summer - Check the waters with national funding agency to help push the idea or at least ask for advice - One low performing (the applicant) that teams up with leading institutions - Purpose - The centre will be located in Cyprus and the other partners visit the centre to transfer knowledge -- Do something similar to Crete with a Security Centre and FORTH - Case studies could be from BMW, factories and municipalities, in Cyprus, Netherlands, Oman, Dubai, etc. -- as supporting actors/beneficiaries - Promote the geographical location of Cyprus as a mediator and differentiate from other proposals - Second phase costs cover administrative and operational costs, personnel costs and some equipment costs. No infrastructure costs - JADS and CUT can offer infrastructure - Look into energy and environment sector -- water problem in Oman/Dubai - Entrepreneurship as the umbrella with vertical axes in different domains. Cross matrix - Collecting, analyzing and exploiting the data that is available in the domains - Come up with a business plan showing the centre is self-sufficient and self-financing - Drive the proposal by what is needed for Phase 2 - Objective is a lifelong project - We can show them the potential of a concrete business plan in Phase 1 - What is needed/who to talk to - A commitment of financial resources and letters of intent from participating for funding the centre of excellence are necessary - Limassol Science and Technology Park and Incubator. We offer the incubator, they offer the infrastructure - The centre for entrepreneurship will match the expertise of businesses to create consortiums: data analytics, IOE, competences, profiles, testimonials 	Andreas Andreou, Mike Papazoglou	

5. 1st mini-school (September 15 - 17, 2016)

The 1st mini-school on Cloud Computing and Software Services was organized in mid-September and included a project meeting, lectures from senior researchers from POLIMI, a stakeholders' meeting and workshop. In the project meeting, members from all project partners discussed the project progress and organised the upcoming steps of the project (CUT and POLIMI with physical presence, UvT through teleconferencing). Researchers, undergraduate and postgraduate students, and academic staff of CUT attended the four lectures held by the POLIMI. During the stakeholders' meeting and workshop, the DOSSIER-cloud project was presented to various representatives from software development companies. The purpose of the workshop was to discuss and identify ways to involve the companies in the project.

Workpackage:	WP2 – New software process for developing and operating distributed applications		
Date: (MM/DD/YYYY)	15/09/2016	Time:	13:00-14:30
Facilitator/Presenter:	All	Location:	III floor, Ttofis building 22, Saripolou, Limassol, Cyprus

1. Subject / Short Description

Project Meeting – Project Management

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Luciano Baresi	POLIMI / Italy	luciano.baresi@polimi.it	
Prof. Garlo Ghezzi	POLIMI / Italy	carlo.ghezzi@polimi.it	
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Andreas Christoforou, PhD candidate	CUT / Cyprus	xristofo@gmail.com	

3. Discussion notes		
Topic and targets	Introducer	Time
<ol style="list-style-type: none"> 1. Skype Calls frequently (2 x month) 2. Carlo & Luciano will suggest areas of collaboration 3. CUT group will send to the POLIMI group it's pending/forthcoming research ideas with Sam, Elisabetta, Raffaella and Danilo 4. Carlo will send papers – explore self-adaptation modeling for DevOps environment where changes and deployment are fast and continues 5. Luciano will send papers – Explore the latest development he presented for resource management in the cloud 6. Next visits in Milan : End October beginning at November, longer stay (1 or 2 weeks). 7. Extensive discussion for stanning serious research collaboration towards papers submission. 8. 2nd mini-scholl with UtV 	Andreas Andreou	

Workpackage:	WP2 – New software process for developing and operating distributed applications		
Date: (MM/DD/YYYY)	17/09/2016	Time:	11:40-12:30
Facilitator/Presenter:	Andreas Andreou, Andreas Christoforou	Location:	Amphitheater 2, Tassos Papadopoulos building, Ifigenias and Themidos corner, Limassol

1. Subject / Short Description
Stakeholders Meeting – Discussion

2. Attendees			
Name	Department/Division	E-mail	Phone
Panayiotis Christodoulou, PhD candidate	CUT / Cyprus	panayiotis.christodoulou@cut.ac.cy	
Constantinos Stylianou, PhD candidate	CUT / Cyprus	cstylianou@cs.ucy.ac.cy	
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Andreas Christoforou, PhD candidate	CUT / Cyprus	xristof@gmail.com	
Metaxas Socratis	Limassol Water Board / Cyprus	contact@wbl.com.cy	
Christos Xenis	LogiSoft Computer Systems / Cyprus	christos@logisoft-cy.com	
Papazoglou Tryfonas	SingularLogic	infocy@singularlogic.eu	
Haris Neophytou	InterFusion Services	hn@interfusionservices.com	
Micaehl Marinos	Exertus Ltd	info@exertuservices.com	
Tasos Savva	Freelancer		

3. Discussion notes		
Topic and targets	Introducer	Time
<ul style="list-style-type: none"> Limassol Water Board IT departmet - interested in collaboration with CUT group in the context of Dossier-Cloud project LogiSoft – National and EU funded projects: Submit proposals in partnership with CUT group Singular Logic – Research and innovation in industry (Beacons, Supermarkets, etc) Exertus – New proposal (Research Promotion Foundation) Experience in HR recruitment using personality (??) Tasos Savva – Experienced S/W developer Possible utilization in projects (RPF - EU) 	Andreas Andreou	

6. 2nd mini-school (October 12 - 14, 2016)

The 2nd mini-school on Cloud Computing and Software Services took place in mid-October and included lectures from senior researchers from UvT and a project meeting between the two partners. These lectures were attended by undergraduate and postgraduate students, as well academic staff from CUT. During the project meeting members from all project partners discussed the project's progress, future steps and deliverables.

Workpackage:	WP2 – New software process for developing and operating distributed applications		
Date: (MM/DD/YYYY)	14/10/2016	Time:	11:45-13:30
Facilitator/Presenter:	All	Location:	<i>Senate Conference Room, Senate Building, Ground floor, (opposite Limassol Municipality) Lemesos</i>

1. Subject / Short Description

Discussion – Teaming proposal

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Willem-Jan van den Heuvel	Tilburg / The Netherlands	w.j.a.m.vdnheuvel@tilburguniversity.edu	
Prof. Mike Papazoglou	Tilburg / The Netherlands	m.p.papazoglou@tilburguniversity.edu	
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Constantinos Stylianou, PhD candidate	CUT / Cyprus	cstylianou@cs.ucy.ac.cy	
Andreas Christoforou, PhD candidate	CUT / Cyprus	xristofo@gmail.com	

Panayiotis Christodoulou, PhD candidate	CUT / Cyprus	panchristodoulou@edu.cut.ac .cy	
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3. Discussion notes		
Topic and targets	Introducer	Time
<p>Impact and impression is important</p> <p>Letters of intent from selected partners with details of their participation (options of Dubai, Lebanon and Oman)</p> <p>Authorities and universities need to be involved</p> <p>Cyprus must be the hub</p> <p>Innovation life cycle</p> <p>Why choose Data Science and the specific pillars of Data Science?</p> <p>Make reviewers understand Data Science</p> <p>Don't overshoot with text. Rather use figures and tables</p> <p>Big organization for collaboration -> you already have results (don't start from scratch)</p> <p>Serious results -> show that you are in a position to have a strong impact</p> <p>Fraunhofer -> claim a Fraunhofer-like institute (centre of excellence) in Cyprus to influence governance</p> <p>Spin-offs -> describe what else can be launched from the centre of excellence for sustainability reasons (business process)</p> <p>Move SWOT analysis to impact</p> <p>KPIs for answering "measurable" in call</p> <p>Objective is for creating a business plan</p> <p>Use S-CUBE template for network of excellence</p> <p>"We will create an institute that will do..."</p> <p>The excellence is not Data Science. It is the institute</p>	All	

<ul style="list-style-type: none"> - Bring expertise - Bring big players in Data Science - Data Science is... (then describe pillars) <ul style="list-style-type: none"> ⇒ Show the structure of the institute and show that it will be sustainable economically and scientifically <p>Describe the importance of Data Science in Cyprus -> Data Science is not here so expertise is needed</p> <p>Section “Background and Context” should refer to the institute</p> <p>WPs need to follow the flow of the text</p> <p>Objectives already written should be moved to start (section 1.1)</p> <p>What do the partners bring to make the institute successful and sustainable?</p> <p>Partners -> Why are they in the consortium? What do they contribute?</p> <ul style="list-style-type: none"> - CNRS is a COE in France - Fraunhofer is a COE in Germany - JADS is a COE in Netherlands <p>Combination of expertise (access to gov.)</p> <ul style="list-style-type: none"> - Why are the other partners interested in Cyprus? <ul style="list-style-type: none"> ○ Next challenge in a low-performing country ○ Attract PhD students ○ Attract staff/research/mobility ○ Geographic location ○ Long-standing collaboration -> exchange of students ○ Trust <p>Can house infrastructure and be sustainable (critical mass)</p> <p>Why it will stop brain drain/help retention of researchers -> show in KPIS the number expected to be attracted</p> <p>CNRS -> provides access to ...</p> <p>Fraunhofer -> I. Adv. Manuf. provides access to ...</p> <p>Living labs for the S3Cy applied to the domain (health, shipping, manufacturing) -> these are the ones that will bring in the money</p>		
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<p>Describe the structure of the management</p> <ul style="list-style-type: none"> - Chosen partners to lead those labs - Add them as Pilot Demonstrator Partners <p>WP2:</p> <ul style="list-style-type: none"> - New WP (business stuff) - Planning/Work breakdown of the institute planning 		
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7. Conclusions

In the context of Workpackage 2, a series of actions and activities were organized and performed aiming to transfer the scientific knowledge to CUT members in the area of DevOps oriented software engineering. First of all, CUT members participated in a number of site visits in Milano, where researches from POLIMI delivered lectures related to software development and deployment for distributed applications. The site visits in POLIMI were concluded with a Workshop, during which members of all project partners came forward with a deeper discussion on topics that needed to be studied further in order to be exploited according to the project's objectives.

A new series of site visits in the Netherlands followed. Researches from CUT attended various lectures given by UvT members that included DevOps principles and workflows, and were focused on applied techniques and methodologies. The topics mentioned during the UvT visits were summarized and presented in a workshop that followed. Project partners examined research opportunities and applications, and discussed possible collaborations and focus of effort for submitting joint proposals to H2020 calls in order to attract further funding.

Two mini-schools on Cloud Computing and Software Services were organized in Cyprus at the CUT's premises. The schools included project meetings, lectures by senior researches from POLIMI and UvT, a Stakeholders meeting and a Workshop. During the project meetings, members from all partners discussed the progress of the project, lessons learned so far, as well the weaknesses and obstacles found thus far. Partners elaborated also on the organisation of the upcoming steps of the project and shared their views on preparing a survey paper on DevOps oriented Software Engineering in order to submit it to a scientific journal. During the 1st mini-school researchers from POLIMI delivered lectures in which undergraduate and graduate students, and members of the academic staff of CUT attended. During the stakeholders' meeting and workshop, the DOSSIER-cloud project was presented to various representatives from the Cypriot market industry, and the public sector. The activities of Workpackage 2 were completed with the 2nd mini-school which followed the same structure and organization with the 1st mini-school. During the 2nd mini-school senior researchers and academics from UvT gave talks on relevant topics of the project.

During Workpackage 2 activities, various project management and discussion meetings were organized. This document quoted minutes and notes from all those meetings and the relevant discussions on the project's progress and future steps, as well as possible future research collaborations and submission of joint proposals for funding under EU or national calls.