DOSSIER-Cloud

DEVOPS-BASED SOFTWARE ENGINEERING FOR THE CLOUD

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Deliverable D4.4

Software Service Composition Under DevOps - Discussion Minutes and Notes

Document details:

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Document history:

Version	Date	Contributor	Comments
1.0	20/2/18	Andreas Christoforou	Initial document, structure and content
2.0	12/3/18	Prof. Andreas Andreou	First review
3.0	29/3/18	Andreas Christoforou	Second review
4.0	2/4/18	Prof. Andreas Andreou	Final review and corrections
5.0	24/1/19	Lambros Lambrou	Add new content (Extended version)
6.0	5/2/19	Andreas Christoforou	Review (Extended version)
7.0	8/2/2019	Prof. Andreas Andreou	Final Formal Review & Approval (Extended version)
8.0	12/02/2019	Partners	Final Formal Approval (Extended version)

Contents

1.   Introduction

1.1   Purpose

This document quotes minutes and notes from various discussion meetings that were performed in the context of site visits and workshops. 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 Workpackage-4 (WP4) that describes the actions to enable a successful transfer of knowledge from the leading institutions (POLIMI, UvT) to CUT and for enriching its knowledge base on research and technical issues on the following subjects: Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration. Furthermore, WP4 is enabling activities on Cloud Service composition.

1.2   Definitions, Acronyms, and Abbreviations

CUT: Cyprus University of Technology

UvT: University of Tilburg

POLIMI: Politecnico di Milano

JADS: Jheronimus Academy of Data Science

1.3   Overview

The rest of the document is structured based on the various site visits performed to Milan and DenBosch following the schedule of execution: In Section 2 and 3 minutes and notes from the series of site visits at POLIMI and UvT in November and December of 2017 respectively. Sections 4 and 5 present the same material for the site visits taking place at the same institutions in December 2017 and February 2018 respectively. Finally, section 6 presents the notes and minutes kept in the workshop that took place at CUT at the end of February 2018. Section 7 concludes this document.

2. POLIMI Site Visit (November 20 – 25, 2017)

During the first site visit of this series, members from the CUT group attended a number of presentations given by the POLIMI group, as well participated in discussions related to the topic and subjects of WP4. In particular, the general topic of these presentations and discussions was dealing with research challenges in Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration.

The notes/minutes are quoted below:

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes			
Date: (MM/DD/YYYY)	11/22/2017	Time:		14:00-15:30
Facilitator:	POLIMI	Location:		POLIMI, III floor, building 22, via Golgi, 42, Milan

1. Subject / Short Description
Q & A on the topics presented

2. Attendees			
Name	Department/Division	E-mail	Phone
Giovanni Quattrocchi, PhD	POLIMI / Italy	giovanni.quattrocchi@polimi.it	
Nicolas Charalambous, MSc student	CUT / Cyprus	nikolas.charalampous@cut.ac.cy	
Michalis Pingos, MSc student	CUT / Cyprus	michalis.pingos@cut.ac.cy	
Spyros Loizou, MSc student	CUT / Cyprus	spyros.loizou@cut.ac.cy	

3. Discussion notes		
Topic and targets	Introducer	Time
• Metrics – monitoring and the importance of each metric	Nicolas	

• Explanation of Giovanni's dissertation • Controller Task descriptors – how the controller works • SLA and how they reach this goal • How to change the controller code to install machine learning algorithms • What SLA identifies	Charalambous, MSc student

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes		
Date: (MM/DD/YYYY)	11/22/2017	Time:	15:45-17:00
Facilitator:	POLIMI	Location:	POLIMI, III floor, building 22, via Golgi, 42, Milan

1. Subject / Short Description

Q & A on the topics presented

2. Attendees

Name	Department/Division	E-mail	Phone
Giovanni Quattrocchi, PhD	POLIMI / Italy	giovanni.quattrocchi@polimi.it	
Nicolas Charalambous, MSc student	CUT / Cyprus	nikolas.charalampous@cut.ac.cy	
Michalis Pingos, MSc student	CUT / Cyprus	michalis.pingos@cut.ac.cy	
Spyros Loizou, MSc student	CUT / Cyprus	spyros.loizou@cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time

About xSpark Tool	Nicolas Charalambous, MSc student
"Spark Control Benchmark" is a benchmarking suite specific for testing the performance of the planning controller in xSpark. The tool is composed of five principal components: • launch.py • run.py • log.py • plot.py • metrics.py In addition to the configuration file config.py, the launch.py module manages the start-up of the instances on Amazon EC2 via spot request and waits the instance creation linked to the spot request and its full launch. Subsequently, the run.py module receives as input the instances on which to configure the cluster (HDFS or Spark) and configure the benchmarks to be executed, and waits for the end of the benchmark. The module log.py downloads and saves the log of the benchmark performed. The plot.py and metrics.py modules respectively generate graphs and calculate metrics.	

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes		
Date: (MM/DD/YYYY)	11/24/2017	Time:	09:00-11:00
Facilitator:	POLIMI	Location:	POLIMI, III floor, building 22, via Golgi, 42, Milan

1. Subject / Short Description

Design and Conduct Experiments

2. Attendees			
Name	Department/Division	E-mail	Phone
Prof. Luciano Baresi	POLIMI / Italy	luciano.baresi@polimi.it	
Giovanni Quattrocchi, PhD	POLIMI / Italy	giovanni.quattrocchi@polimi.it	
Nicolas Charalambous, MSc student	CUT / Cyprus	nikolas.charalampous@cut.ac.cy	
Spyros Loizou, MSc student	CUT / Cyprus	spyros.loizou@cut.ac.cy	

3. Discussion notes		
Topic and targets	Introducer	Time

Azure account :
 	
 • How many machines we will be used to create the account? Moreover, what are the specifications of these machines?
 • Create an academic account →Is this necessary ?
 Create an academic account because we are working in the context of a research project → Why? Clarify
     ○ 30 machines max, 2 clusters: hdfs and spark
 • Specifications of the machines that we will bind.
     ○ Standard_D14_v2_Promo in region south central us
     ○ Available on the azure website: https://azure-info.azurewebsites.net/compute/vmsizes?location=centralus&vm=Standard_D14_v2_Promo#
         ▪ NumberOfCores: 16
         ▪ OsDiskSizeInMB: 1047552
         ▪ ResourceDiskSizeInMB: 819200
         ▪ MemoryInMB: 114688
         ▪ MaxDataDiskCount: 64
	Nicolas Charalambous, MSc student	

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes

Date: (MM/DD/YYYY)	11/24/2017	Time:	14:00-16:00
Facilitator:	POLIMI	Location:	POLIMI, III floor, building 22, via Golgi, 42, Milan

1. Subject / Short Description

Planning of next research steps for resource management with xSpark

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Luciano Baresi	POLIMI / Italy	luciano.baresi@polimi.it	
Giovanni Quattrocchi, PhD	POLIMI / Italy	giovanni.quattrocchi@polimi.it	
Nicolas Charalambous, MSc student	CUT / Cyprus	nikolas.charalampous@cut.ac.cy	
Spyros Loizou, MSc student	CUT / Cyprus	spyros.loizou@cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time
Azure Account • Spark can be used only with Azure or AWS for this type of research • Academic account with exact specifications of the machines Controller Parameters • T_SAMPLE: (ms) →> Control period (frequency) • CORE_MIN: Minimum Cores that will be used • CPU_PERIOD: can't be changed • Aggressive controller behaviour	Nicolas Charalambous, MSc student	

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes		
Date: (MM/DD/YYYY)	11/25/2017	Time:	09:00-12:00
Facilitator:	POLIMI	Location:	POLIMI, III floor, building 22, via Golgi, 42, Milan

1. Subject / Short Description

Summary of visits – Planning of next actions

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Luciano Baresi	POLIMI / Italy	luciano.baresi@polimi.it	
Giovanni Quattrocchi, PhD	POLIMI / Italy	giovanni.quattrocchi@polimi.it	
Nicolas Charalambous, MSc student	CUT / Cyprus	nikolas.charalampous@cut.ac.cy	
Spyros Loizou, MSc student	CUT / Cyprus	spyros.loizou@cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time
• CUT group should investigate the possibility of creating an academia research account on Azure • POLIMI team will provide all necessary details to CUT team in order to be able to replicate the experimental environment and run experiments • ML models that will be used should be selected and presented by CUT team	Nicolas Charalambous, MSc student	

3. UvT Site Visit (December 4 – 8, 2017)

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes		
Date: (MM/DD/YYYY)	12/04/2017	Time:	09:30-11:00
Facilitator:	UvT	Location:	Jheronimus Academy of Data Science Sint Janssingel 92 5211 DA 's-Hertogenbosch The Netherlands

1. Subject / Short Description

Training and discussion about Smart Data Processing, Automation, Smart Manufacturing & Industry.

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Mike Papazoglou	UvT / The Netherlands	mikep@uvt.nl	
Indika Priyantha, PhD	JADS / The Netherlands	pkumrawd@yahoo.com	
Spyros Loizou, MSc student	CUT / Cyprus	spyros.loizou@cut.ac.cy	
Michalis Pingos, MSc student	CUT / Cyprus	michalis.pingos@cut.ac.cy	
Panayiotis Antoniou, BSc student	CUT / Cyprus	pk.antoniou@edu.cut.ac.cy	
Christoforos Vasiliou, BSc student	CUT / Cyprus	char.vasiliou@edu.cut.ac.cy	

3. Discussion notes		
Topic and targets	Introducer	Time
• **Level 4** {Enterprise, Customer} • **Level 3** {Production} • **Level 2,1,0** {IoT}	Spyros Loizou, MSc student	

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes		
Date: (MM/DD/YYYY)	12/04/2017	Time:	11:30-13:00
Facilitator:	UvT	Location:	Jheronimus Academy of Data Science Sint Janssingel 92 5211 DA 's-Hertogenbosch The Netherlands

1. Subject / Short Description
Training and discussion about Smart Data Processing, Automation, Smart Manufacturing & Industry.

2. Attendees			
Name	Department/Division	E-mail	Phone
Prof. Mike Papazoglou	UvT / The Netherlands	mikep@uvt.nl	
Indika Priyantha, PhD	JADS / The Netherlands	pkumrawd@yahoo.com	
Spyros Loizou, MSc student	CUT / Cyprus	spyros.loizou@cut.ac.cy	
Michalis Pingos, MSc student	CUT / Cyprus	michalis.pingos@cut.ac.cy	

| Panayiotis Antoniou, BSc student | CUT / Cyprus | pk.antoniou@edu.cut.ac.cy | |
| Christoforos Vasiliou, BSc student | CUT / Cyprus | char.vasiliou@edu.cut.ac.cy | |

3. Discussion notes

Topic and targets	Introducer	Time
Questions about Industry 4.0 / Smart Manufacturing: 1) We are going to build a system from the beginning or use parts of the existing system? How the system should be built? (Programming language etc.) 2) In order to build an interactive 3D dashboard (visualize, customize, attach components) which is the best solution? 3) X3dom, Unity or Unreal Engine (uses blueprints)? How must we export these details? 4) After the visual 3D presentation what is the next step? How must we export these details? 5) How can we build a connection/translation between level 4 and level 3? 6) How we can we build a connection/translation between level 3 and levels 2, 1, 0 ? 7) How can we build a connection between customers (level4) and shop floor (level 2, 1, 0)? Blueprints could solve this problem? 8) 70+ papers with citations, URL and venues to take into consideration for a possible survey paper?	Michalis Pingos, MSc student	

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Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes		
Date: (MM/DD/YYYY)	12/05/2017	Time:	09:30-11:00
Facilitator:	UvT	Location:	Jheronimus Academy of Data Science Sint Janssingel 92 5211 DA 's-Hertogenbosch The Netherlands

1. Subject / Short Description

Training and discussion about Smart Data Processing, Automation, Smart Manufacturing & Industry.

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Mike Papazoglou	UvT / The Netherlands	mikep@uvt.nl	
Indika Priyantha, PhD	JADS / The Netherlands	pkumrawd@yahoo.com	
Spyros Loizou, MSc student	CUT / Cyprus	spyros.loizou@cut.ac.cy	
Michalis Pingos, MSc student	CUT / Cyprus	michalis.pingos@cut.ac.cy	
Panayiotis Antoniou, BSc student	CUT / Cyprus	pk.antoniou@edu.cut.ac.cy	
Christoforos Vasiliou, BSc student	CUT / Cyprus	char.vasiliou@edu.cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time
Working with blueprints:	Indika Priyantha,	

		PhD	
- Blueprints are domain independent. - Trasformation to Blueprints are based on OWL - SPARQL run queries - Work on top of machines - IoT devices get data in order for the blueprint to make the decissions			

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes		
Date: (MM/DD/YYYY)	12/05/2017	Time:	11:30-13:00
Facilitator:	UvT	Location:	Jheronimus Academy of Data Science Sint Janssingel 92 5211 DA 's-Hertogenbosch The Netherlands

1. Subject / Short Description

Training and discussion about Smart Data Processing, Automation, Smart Manufacturing & Industry.

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Mike Papazoglou	UvT / The Netherlands	mikep@uvt.nl	
Indika Priyantha, PhD	JADS / The Netherlands	pkumrawd@yahoo.com	
Spyros Loizou, MSc student	CUT / Cyprus	spyros.loizou@cut.ac.cy	
Michalis Pingos, MSc student	CUT / Cyprus	michalis.pingos@cut.ac.cy	
Panayiotis Antoniou, BSc student	CUT / Cyprus	pk.antoniou@edu.cut.ac.cy	

Christoforos Vasiliou, BSc student	CUT / Cyprus	char.vasiliou@edu.cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time
How SVN works • Make an account to github • Prepare PC to run locally github • Pull from github • View machine with images • IP address for machine blueprint **Role based Portal** Personalized point of access with augmented reality and visualization	Indika Priyantha, PhD	

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes		
Date: (MM/DD/YYYY)	12/06/2017	Time:	09:30-11:00
Facilitator:	UvT	Location:	Jheronimus Academy of Data Science Sint Janssingel 92 5211 DA 's-Hertogenbosch The Netherlands

1. Subject / Short Description

Training and discussion about Smart Data Processing, Automation, Smart Manufacturing & Industry.

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Mike Papazoglou	UvT / The Netherlands	mikep@uvt.nl	
Indika Priyantha, PhD	JADS / The Netherlands	pkumrawd@yahoo.com	
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Andreas Christoforou, PhD student	CUT / Cyprus	ax.christoforou@edu.cut.ac.cy	
Adonis Podinas, MSc student	CUT / Cyprus	ak.podinas@edu.cut.ac.cy	
Spyros Loizou, MSc student	CUT / Cyprus	spyros.loizou@cut.ac.cy	
Michalis Pingos, MSc student	CUT / Cyprus	michalis.pingos@cut.ac.cy	
Panayiotis Antoniou, BSc student	CUT / Cyprus	pk.antoniou@edu.cut.ac.cy	
Christoforos Vasiliou, BSc student	CUT / Cyprus	char.vasiliou@edu.cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time
Product Data and Knowledge management 1) Data transformation services. Heterogeneous Data => Knowledge Processing 2) Heterogenous Data 3) Knowledge Processing Environment 4) Product Specific and Knowledge Management **Market Place Repository** Combine searching of manufacturing data and knowledge	Indika Priyantha, PhD	

Analytics Get manufacturing data from knowledge template and convert them to useful information **Presentation and Visualization** Dual purpose: - Creating and visualizing - Visual graphical language that allows users to express thei requests and prefereneces	

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes		
Date: (MM/DD/YYYY)	12/06/2017	Time:	11:30-13:00
Facilitator:	UvT	Location:	Jheronimus Academy of Data Science Sint Janssingel 92 5211 DA 's-Hertogenbosch The Netherlands

1. Subject / Short Description

Training and discussion about Smart Data Processing, Automation, Smart Manufacturing & Industry.

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Mike Papazoglou	UvT / The Netherlands	mikep@uvt.nl	

Indika Priyantha, PhD	JADS / The Netherlands	pkumrawd@yahoo.com	
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Andreas Christoforou, PhD student	CUT / Cyprus	ax.christoforou@edu.cut.ac.cy	
Adonis Podinas, MSc student	CUT / Cyprus	ak.podinas@edu.cut.ac.cy	
Spyros Loizou, MSc student	CUT / Cyprus	spyros.loizou@cut.ac.cy	
Michalis Pingos, MSc student	CUT / Cyprus	michalis.pingos@cut.ac.cy	
Panayiotis Antoniou, BSc student	CUT / Cyprus	pk.antoniou@edu.cut.ac.cy	
Christoforos Vasiliou, BSc student	CUT / Cyprus	char.vasiliou@edu.cut.ac.cy	

3. Discussion notes		
Topic and targets	Introducer	Time
Protégé • Save Ontology to URL • Object Properties: Describe relationship between instances • Data Properties: Describe relationship between data values or instances • Add individuals • Object property assertion • topObject Property Example with module and persons join	Indika Priyantha, PhD	

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes		
Date: (MM/DD/YYYY)	12/07/2017	Time:	09:00-10:30

Facilitator:	UvT	Location:	Room P.423 Sciences building, 4th floor De Boelelaan 1105, 1081 HV Amsterdam, Netherlands

1. Subject / Short Description

Discussion and future work about Smart Data Processing, Automation, Smart Manufacturing & Industry. Software (micro) Services Synthesis.

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Patricia Lago	Amsterdam / The Netherlands	p.lago@vu.nl	
Prof. Ivano Malavolta	Amsterdam / The Netherlands	i.malavolta@vu.nl	
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Andreas Christoforou, PhD student	CUT / Cyprus	ax.christoforou@edu.cut.ac.cy	
Adonis Podinas, MSc student	CUT / Cyprus	ak.podinas@edu.cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time

PATRICIA
 	
A. PROJECTS
 	
    a. Software Intensive Systems
 	
    b. Sustainability → Hot topic of interest, Patricia can bring on a network of partners mostly from Scandinavia.
 	
    c. Architecture 《Sustainability
 	
Integration of data centres and glass houses → Patricia's
	Prof. Andreas Andreou	

team is currently running a project with glass-houses, investigate the potential of collaborating on Machine Learning approaches coupled with IoT with sensors installed and collecting data in glass houses

B. RESEARCH

    a. Survey on Sustainability → will send it to us

    b. Prepare a new questionnaire adding new and more focused questions to help us extract info to use on the FCM construction

IVANO

A. PROJECTS

    a. Model Based Systems → Robots

        i. For crops management

        ii. Idea: A farmer could reuse ready-made components (or services) to set-up his own solution for his/her farm

B. RESEARCH

    a. Examine 'maintainability' property

    b. Create a FCM with qualitative parameters and assess (or predict) the level of maintainability of a software system

        i. Given a set of parameters that will be related to the architecture (SOA) of the system

        ii. Utilisation of a micro-services approach

        iii. Investigate whether the use of a new, or the substitution of an existing set of microservices affects, and to what extent, the level of maintainability of the whole system

    c. Be based on previous work to construct the FCM → identify concepts and causalities using their survey, literature overview and questionnaires

d. A colleague of Ivano (Paolo) will also be engaged **OVERALL** Try to establish an Erasmus agreement to enable the two teams to collaborate and exchange personnel after the end of the project	

VU - CUT Collaboration
 	
- Check European Calls and discuss possible proposals
- FCM application to software sustainability
  - Patricia will provide results from questionnaires
  - Cut will study and deliver any comments - lacks - further details may needed
  - Proceed to construct the model ML-FCM
 	
Ivano -> A PhD Student will contact us and provide material (images, papers etc)
- Prepare a questionnaire
- Shared drive
- Metrices described in presentation is a good starting point
	Andreas Christoforou, PhD Student

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes		
Date: (MM/DD/YYYY)	12/07/2017	Time:	11:00-13:00
Facilitator:	UvT	Location:	Jheronimus Academy of Data Science Sint Janssingel 92 5211 DA 's-Hertogenbosch The Netherlands

1. Subject / Short Description

Discussion and future work about Smart Data Processing, Automation, Smart Manufacturing & Industry.

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Mike Papazoglou	UvT / The Netherlands	mikep@uvt.nl	
Indika Priyantha, PhD	JADS / The Netherlands	pkumrawd@yahoo.com	
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Andreas Christoforou, PhD candidate	CUT / Cyprus	ax.christoforou@edu.cut.ac.cy	
Adonis Podinas, MSc student	CUT / Cyprus	ak.podinas@edu.cut.ac.cy	
Spyros Loizou, MSc student	CUT / Cyprus	spyros.loizou@cut.ac.cy	
Michalis Pingos, MSc student	CUT / Cyprus	michalis.pingos@cut.ac.cy	
Panayiotis Antoniou, BSc student	CUT / Cyprus	pk.antoniou@edu.cut.ac.cy	
Christoforos Vasiliou, BSc student	CUT / Cyprus	char.vasiliou@edu.cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time
Thesis discussion Extension of Product-oriented Configuration Language (PoCL) with a 3D/CAD/Gamification modelling feature of Product-service systems, parts, components, etc., where the customer and the designer/engineer can co-design a customized PSS variant in an intuitive and user-friendly manner on the basis of integrated manufacturing, product, workflow, quality, etc. knowledge, by means of blueprints models/images.	Prof. Mike Papazoglou	

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes		
Date: (MM/DD/YYYY)	12/08/2017	Time:	09:30-11:00
Facilitator:	UvT	Location:	Jheronimus Academy of Data Science Sint Janssingel 92 5211 DA 's-Hertogenbosch The Netherlands

1. Subject / Short Description

Discussion and future work about Smart Data Processing, Automation, Smart Manufacturing & Industry.

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Mike Papazoglou	UvT / The Netherlands	mikep@uvt.nl	
Indika Priyantha, PhD	JADS / The Netherlands	pkumrawd@yahoo.com	
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Andreas Christoforou, PhD student	CUT / Cyprus	ax.christoforou@edu.cut.ac.cy	
Adonis Podinas, MSc student	CUT / Cyprus	ak.podinas@edu.cut.ac.cy	
Spyros Loizou, MSc student	CUT / Cyprus	spyros.loizou@cut.ac.cy	
Michalis Pingos, MSc student	CUT / Cyprus	michalis.pingos@cut.ac.cy	

Panayiotis Antoniou, BSc student	CUT / Cyprus	pk.antoniou@edu.cut.ac.cy	
Christoforos Vasiliou, BSc student	CUT / Cyprus	char.vasiliou@edu.cut.ac.cy	

3. Discussion notes		
Topic and targets	Introducer	Time
Thesis Discussion An extended MDA for smart manufacturing, which extends the typical MDA approaches, with a third lower layer/model. In traditional MDE approaches, two levels of models usually co-exist: (i) Platform Independent Model (PoCL following our approach), and Platform Specific Model (Blueprints models). A third model/Layer is missing and needed, which represents the actual/executable factory floor level, something we may call Factory Floor Specific Model (FFSM). By introducing this new modelling level, mapping rules should also be introduced between PSM and FFSM.	Prof. Mike Papazoglou	

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes		
Date: (MM/DD/YYYY)	12/08/2017	Time:	11:30-13:00
Facilitator:	UvT	Location:	Jheronimus Academy of Data Science Sint Janssingel 92 5211 DA 's-Hertogenbosch The Netherlands

1. Subject / Short Description

Discussion and future work about Smart Data Processing, Automation, Smart Manufacturing & Industry.

2. Attendees			
Name	Department/Division	E-mail	Phone
Prof. Mike Papazoglou	UvT / The Netherlands	mikep@uvt.nl	
Indika Priyantha, PhD	JADS / The Netherlands	pkumrawd@yahoo.com	
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Andreas Christoforou, PhD student	CUT / Cyprus	ax.christoforou@edu.cut.ac.cy	
Adonis Podinas, MSc student	CUT / Cyprus	ak.podinas@edu.cut.ac.cy	
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Panayiotis Antoniou, BSc student	CUT / Cyprus	pk.antoniou@edu.cut.ac.cy	
Christoforos Vasiliou, BSc student	CUT / Cyprus	char.vasiliou@edu.cut.ac.cy	

3. Discussion notes		
Topic and targets	Introducer	Time
Future work: • Dependent model that provides machine to machine connection • Connection of blueprints with machines • Connection of IoT with blueprints • SCADA Systems and SCADA principles	Prof. Mike Papazoglou	

4. POLIMI Site Visit (December 14 – 16, 2017)

Members from the CUT group participated in the second site visit at POLIMI. During this visit members from the POLIMI group presented their work that is related to software development and deployment for distributed applications. Secondly, a comprehensive introduction on modeling social debt with FCMs project was performed.

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes		
Date: (MM/DD/YYYY)	12/15/2017	Time:	13:30-14:30
Facilitator:	POLIMI	Location:	POLIMI, III floor, building 22, via Golgi, 42, Milan

1. Subject / Short Description

Discussion on concept standardization issues

2. Attendees

Name	Department/Division	E-mail	Phone
Martin Garringa, PhD	POLIMI / Italy	martin.garinga@polimi.it	
Constantinos Stylianou, PhD	CUT / Cyprus	cstylianou@cs.ucy.ac.cy	
Stefanos Manoli, MSc student	CUT / Cyprus	sp.manoli@edu.cut.ac.cy	
Foivos Kasapi, MSc student	CUT / Cyprus	fp.kasapi@edu.cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time
The discussion focused on how individual community smells were modelled using FCMs and then consolidated into one unified model.	Constantinos Stylianou, PhD	

The remainder of the session was used to discuss various issues that needed to be resolved, particular: • How to handle the aggregation of concepts influencing community smells • Whether to include concepts representing social debt, organizational structure (quality), social structure (quality) • Grouping of similar concepts into one concept. • Correcting the name of concepts to match their interpretation, • How to perform fuzzy analysis of the concepts so that they are broken down into fuzzy overlapping intervals, and • Which metrics to use for the initialization of activation levels of concepts (nodes) and the weight values of causal relationships (edges).	

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes		
Date: (MM/DD/YYYY)	12/15/2017	Time:	14:30-15:30
Facilitator:	POLIMI	Location:	POLIMI, III floor, building 22, via Golgi, 42, Milan

1. Subject / Short Description

Discussion on concept aggregation issues

2. Attendees

Name	Department/Division	E-mail	Phone
Martin Garringa, PhD	POLIMI / Italy	martin.garinga@polimi.it	
Constantinos Stylianou, PhD	CUT / Cyprus	cstylianou@cs.ucy.ac.cy	

| Stefanos Manoli, MSc student | CUT / Cyprus | sp.manoli@edu.cut.ac.cy | |
| Foivos Kasapi, MSc student | CUT / Cyprus | fp.kasapi@edu.cut.ac.cy | |

3. Discussion notes

Topic and targets	Introducer	Time
- Concept definition: - Verify the meaning of each concept - Concept standardization: - Verify that common concepts indeed share the same definition - Check for commonalities between other concepts - Concept aggregation: - Determine whether to aggregate all the effects of a community smell into one concept and then on its affecting concept	Constantinos Stylianou, PhD	

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes		
Date: (MM/DD/YYYY)	12/15/2017	Time:	16:00-17:00
Facilitator:	POLIMI	Location:	POLIMI, III floor, building 22, via Golgi, 42, Milan

1. Subject / Short Description

Discussion on concept fuzzification and measuring

2. Attendees

Name	Department/Division	E-mail	Phone
Martin Garringa, PhD	POLIMI / Italy	martin.garinga@polimi.it	

Constantinos Stylianou, PhD	CUT / Cyprus	cstylianou@cs.ucy.ac.cy	
Stefanos Manoli, MSc student	CUT / Cyprus	sp.manoli@edu.cut.ac.cy	
Foivos Kasapi, MSc student	CUT / Cyprus	fp.kasapi@edu.cut.ac.cy	

3. Discussion notes		
Topic and targets	Introducer	Time
- Concept fuzzification and measuring: - How to break down each concept into overlapping intervals - How to quantify each concept - Initialization and normalization: - How to determine the activation levels of concepts - How to determine the weight value of causal relationships	Constantinos Stylianou, PhD	

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes		
Date: (MM/DD/YYYY)	12/16/2017	Time:	11:30-13:30
Facilitator:	POLIMI	Location:	POLIMI, III floor, building 22, via Golgi, 42, Milan

1. Subject / Short Description
Planning of next research steps for community smells Planning of next research steps for social debt

2. Attendees			
Name	Department/Division	E-mail	Phone

Martin Garringa, PhD	POLIMI / Italy	martin.garinga@polimi.it	
Constantinos Stylianou, PhD	CUT / Cyprus	cstylianou@cs.ucy.ac.cy	
Stefanos Manoli, MSc student	CUT / Cyprus	sp.manoli@edu.cut.ac.cy	
Foivos Kasapi, MSc student	CUT / Cyprus	fp.kasapi@edu.cut.ac.cy	

3. Discussion notes		
Topic and targets	**Introducer**	**Time**
- With respect to social debt, the team examined the possible ways of initializing the concept activation levels, as well as causal relationship weight values. Possible solutions, like using surveys for practitioners/students/student practitioners and literature reviews were investigated. - With regards to community smells, the team dedicated time to brainstorm candidate machine learning algorithms for prediction base on the format of the results generated by CodeFace4Smells project analysis, which was presented earlier in the visit. - The issue of algorithms handling timely data was discussed in detail. CodeFace4Smells analysis uses quarterly project data to generate results, so the potential target of predicting how many bugs/issues will be reported using the community smells present in a release of a project may have to treat the data as a time series.	Constantinos Stylianou, PhD	

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes		
Date: (MM/DD/YYYY)	12/16/2017	Time:	15:00-16:00
Facilitator:	POLIMI	Location:	POLIMI, III floor, building 22, via Golgi, 42, Milan

1. Subject / Short Description

Coordination activities

2. Attendees			
Name	Department/Division	E-mail	Phone
Martin Garringa, PhD	POLIMI / Italy	martin.garinga@polimi.it	
Constantinos Stylianou, PhD	CUT / Cyprus	cstylianou@cs.ucy.ac.cy	
Stefanos Manoli, MSc student	CUT / Cyprus	sp.manoli@edu.cut.ac.cy	
Foivos Kasapi, MSc student	CUT / Cyprus	fp.kasapi@edu.cut.ac.cy	

3. Discussion notes		
Topic and targets	Introducer	Time
This session concluded site visit with planning of next steps, followed by team coordination activities: • For social debt, the next important steps were to perform fuzzy analysis of concepts, to better understand each concept and help decide the metric to adopt to initialize each corresponding activation level, and to merge similar concepts together, to reduce the size of the model. • For community smells, the next step was to run more project analyses in order to generate further datasets and, in addition, to determine which algorithms to apply.	Constantinos Stylianou, PhD	

5. POLIMI Visit (February 5 – 6, 2018)

Members from the CUT group participated in the third site visit at POLIMI. During this visit members from the POLIMI group presented their work that is related to software development and deployment for distributed applications. At first, a comprehensive introduction was made on the work Fine-grained Resource Provisioning for Big-data Applications" (xSpark) and discussion followed.

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes				
Date: (MM/DD/YYYY)	02/05/2018	Time:		11:15-13:00	
Facilitator:	POLIMI	Location:		POLIMI, III floor, building 22, via Golgi, 42, Milan	

1. Subject / Short Description
Discussion on extension of work "Fine-grained Resource Provisioning for Big-data Applications" (xSpark) utilizing ML models

2. Attendees			
Name	Department/Division	E-mail	Phone
Prof. Luciano Baresi	POLIMI/Italy	luciano.baresi@polimi.it	
Giovanni Quattrocchi, PhD	POLIMI / Italy	giovanni.quattrocchi@polimi.it	
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Prof. Sotiris Chatzis	CUT / Cyprus	sotirios.chatzis@cut.ac.cy	
Andreas Christoforou, PhD student	CUT / Cyprus	andreas.christoforou@cut.ac.cy	
Nicolas Charalambous, MSc student	CUT / Cyprus	nikolas.charalambus@cut.ac.cy	

3. Discussion notes		
Topic and targets	**Introducer**	**Time**
CUT should create a new account on Azure: • Environment configuration • Experiments replication • Experiments Results Definition of the new process control model based on deep learning (reinforcement learning can be also considered) Nikolas is the responsible researcher from CUT and Giovanni from POLIMI	Andreas Christoforou, PhD student	

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes		
Date: (MM/DD/YYYY)	02/05/2018	**Time:**	14:00-15:30
Facilitator:	POLIMI	**Location:**	POLIMI, III floor, building 22, via Golgi, 42, Milan

1. Subject / Short Description
Discussion on technical aspects of xSpark extension

2. Attendees			
Name	**Department/Division**	**E-mail**	**Phone**
Prof. Luciano Baresi	POLIMI/Italy	luciano.baresi@polimi.it	
Giovanni Quattrocchi, PhD	POLIMI / Italy	giovanni.quattrocchi@polimi.it	
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Prof. Sotiris Chatzis	CUT / Cyprus	sotirios.chatzis@cut.ac.cy	

Andreas Christoforou, PhD student	CUT / Cyprus	andreas.christoforou@cut.ac.cy	
Nicolas Charalambous, MSc student	CUT / Cyprus	nikolas.charalambus@cut.ac.cy	

3. Discussion notes		
Topic and targets	Introducer	Time

Set up of Azure Account
 	
• Resource Group
   o Storage Component: Load image given from POLIMI
   o Enterprise Application
• Client Program
   o Written in Python
   o Needs credentials from Azure account
   o xSpark_bench.py – h for help
• HDFS
   o Change launch.py accordingly
   o See config.py
 	
How does the Controller work?
From where does the executor ask for resources?
What is the target?
Which is the minimum configuration?
	Andreas Christoforou, PhD student	

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes		
Date: (MM/DD/YYYY)	02/05/2018	Time:	15:45-17:00
Facilitator:	POLIMI	Location:	POLIMI, III floor, building 22, via Golgi, 42, Milan

1. Subject / Short Description
Discussion on extension of work "Supporting the Decision of Migrating to Microservices Through Multi-Layer Fuzzy Cognitive Maps"

2. Attendees			
Name	Department/Division	E-mail	Phone
Prof. Luciano Baresi	POLIMI/Italy	luciano.baresi@polimi.it	
Martin Garringa, PhD	POLIMI / Italy	giovanni.quattrocchi@polimi.it	
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Prof. Sotiris Chatzis	CUT / Cyprus	sotirios.chatzis@cut.ac.cy	
Andreas Christoforou, PhD student	CUT / Cyprus	andreas.christoforou@cut.ac.cy	
Nicolas Charalambous, MSc student	CUT / Cyprus	nikolas.charalambus@cut.ac.cy	

3. Discussion notes		
Topic and targets	Introducer	Time

ICSOC paper extension
 	
   o Experts : a numerical description to show the utilization of 45 questionnaires
   o Present questionnaires graphically or otherwise
   o More experimentation with lambda factor
   o Statistical test - which is suitable?
   o Re-evaluated dynamic analysis with 16 cases
	Andreas Christoforou, PhD student	

o The new questionnaires performed are divided in two types:
       o Experts opinion (45 questionnaires) that are used to calibrate the weights in the main FCM.
       o Industrial case studies (19 questionnaires) that are used to execute the model and compare the model's outcome w.r.t. the actual answers. From those, only 16 are usable since the other three answered "IDK" to the key question of microservices adoption.
	Martin Garringa, PhD	

- o The 45 experts "approved" the model since they did not change any concept. However, the answers may suggest changes to the weights. We should point out whether those changes were important or just slight adjustments (were they high? were they low? were they medium?).
- o To realize how important were those changes, we run the model with the original configuration (considering the 7 experts of the previous paper). Then we calibrated the weights according to the new answers and re-run. Changes were minimal.
- o The model behaves positively, always towards adoption, even with more strength than the case studies themselves. The positive behaviour of the model can be explained by the presence of more positive cycles than negative ones. Also, the extreme scenarios shown that the model can give a negative outcome given a negative scenario.
- o Statistically speaking, Bartlett's test does not provide any significance in our case because the responses do not need to be correlated with each other.

To Do:
- • Run and document with more values of Lambda (although the best ones so far are with 0.8 and 0.9)
- • Check in detail those cases in which there were deviations in the case study vs the outcome of the model. Go to the internals of that case and 37analyse what happened (all the activation values)
- • Partition the case studies in different ways: half and half; leave one out at random to validate and train with the others
- • What-if scenarios? Some negative ones. Identify the key parameters "alerting" where should put attention
- • Chromeback test?
- • Gather the results of the last two case studies (company in Milan)

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes		
Date: (MM/DD/YYYY)	02/06/2018	Time:	11:15-13:00

Facilitator:	POLIMI	Location:	POLIMI, III floor, building 22, via Golgi, 42, Milan

1. Subject / Short Description

Discussion on extension of work "A mixed integer linear programming optimization approach for multi-cloud capacity allocation" utilizing ML models

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Danilo Ardagna	POLIMI / Italy	danilo.ardagna@polimi.it	
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Prof. Sotiris Chatzis	CUT / Cyprus	sotirios.chatzis@cut.ac.cy	
Andreas Christoforou, PhD student	CUT / Cyprus	andreas.christoforou@cut.ac.cy	
Nicolas Charalambous, MSc student	CUT / Cyprus	nikolas.charalambus@cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time
Danilo • Danilo explained how their approach is applied for Resource Management and the configuration of their environment • Danilo's team will provide CUT team with data, experiments logs • CUT team will investigate the possibility of applying ML models on Danilo's team data	Andreas Christoforou, PhD student	

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes		
Date: (MM/DD/YYYY)	02/06/2018	Time:	14:00-15:30
Facilitator:	POLIMI	Location:	POLIMI, III floor, building 22, via Golgi, 42, Milan

1. Subject / Short Description

Discussion on technical aspects of multi-cloud experimental environment

2. Attendees

Name	Department/Division	E-mail	Phone
Michele Ciavotta, PhD	POLIMI / Italy	michele.ciavotta@polimi.it	
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Prof. Sotiris Chatzis	CUT / Cyprus	sotirios.chatzis@cut.ac.cy	
Andreas Christoforou, PhD student	CUT / Cyprus	andreas.christoforou@cut.ac.cy	
Nicolas Charalambous, MSc student	CUT / Cyprus	nikolas.charalambus@cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time
Michele 　Simulators 　Get approval from Danilo to provide CUT team with data and simulators	Andreas Christoforou, PhD student	

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes		
Date: (MM/DD/YYYY)	02/06/2018	Time:	15:45-17:00
Facilitator:	POLIMI	Location:	POLIMI, III floor, building 22, via Golgi, 42, Milan

1. Subject / Short Description

Summary and complete of the Site Visit

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Luciano Baresi	POLIMI/Italy	luciano.baresi@polimi.it	
Prof. Danilo Ardagna	POLIMI / Italy	danilo.ardagna@polimi.it	
Martin Garringa, PhD	POLIMI / Italy	martin.garinga@polimi.it	
Giovanni Quattrocchi, PhD	POLIMI / Italy	giovanni.quattrocchi@polimi.it	
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Prof. Sotiris Chatzis	CUT / Cyprus	sotirios.chatzis@cut.ac.cy	
Andreas Christoforou, PhD student	CUT / Cyprus	andreas.christoforou@cut.ac.cy	
Nicolas Charalambous, MSc student	CUT / Cyprus	nikolas.charalambus@cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time

Summary and conclusion of the Site Visit
 	
   o   Set up upcoming workshop details
   o   Next steps for research collaboration
	Andreas Christoforou, PhD student	

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- o Prepare list of upcoming conferences - o Target some conferences - o Final review of the project, when? Cost so far? - o PM meeting in Cyprus - o Transfer money from one category to another → from travel to personnel - o Email to Mike, WJ cc the agenda utilize budget for publications - o ICSA - Seattle ? Can Dossier Cloud cover Luciano's expenses? - o Check workshops submission deadline - o Setup next Workshop topics : - o Research oriented discussion on - o .... - o Practical benefits of 15 years of services composition		

6.   CUT Workshop (February 26-28, 2018)

Representatives from all project partners participated in the third workshop organized at the CUT premises in Limassol. During this 3-day workshop members from POLIMI and UvT delivered lectures and presentations to members of the CUT group, as well as to other researchers and students. Also, a project management meeting was conducted in which members from all partners discussed the progress of the project. On the last day of the workshop, the 3rd Stakeholders Meeting and Workshop on Cloud Computing, Software Services and Smart Data Processing was organized. Members from all project partners presented the DOSSIER-Cloud project and part of its work to a group of targeted local stakeholders and finally a discussion for collaboration between the DOSSIER-Cloud members and the local stakeholders followed.

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes		
Date: (MM/DD/YYYY)	27/02/2018	Time:	12:00-13:00
Facilitator:	CUT	Location:	EE-CEID, 39, Saripolou & Socratous, Limassol

1. Subject / Short Description
Project Management Meeting

2. Attendees			
Name	Department/Division	E-mail	Phone
Prof. Luciano Baresi	POLIMI/Italy	luciano.baresi@polimi.it	
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Prof. Willem-Jan Van Den Huvei	Tillburg/The Netherlands	w.j.a.m.vdnheuvel@tillburguniversity.edu	
Andreas Christoforou, PhD student	CUT / Cyprus	ax.christoforou@edu.cut.ac.cy	

3. Discussion notes		
Topic and targets	**Introducer**	**Time**

o   Organization of remaining Workshop
    o   Workshop at Tilburg – June (14th of June - career perspective)
    o   Workshop at POLIMI - September (submit a Workshop in the context of European Conference on Service-Oriented and Cloud Computing (ESOCC)
o   High Resolution logo of Dossier → Send it to both partners
o   Check if we can join running H2020 projects
o   WP4 extended for 6 more months - 8/2018
o   Collect workshop material from participants
o   Consortium for next h2020 call POLIMI-UvT-(Invite Leyman team?)
o   SummerSoc - Dissemination for Dossier-Cloud
	Andreas Christoforou, PhD student	

Workpackage:	WP4 - Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration minute notes

Date: (MM/DD/YYYY)	28/02/2018	**Time:**	11:30-12:00
Facilitator:	CUT	**Location:**	EE-CEID, 39, Saripolou & Socratous, Limassol

1. Subject / Short Description
Summary - Concluding remarks - Discussion

2. Attendees			
Name	**Department/Division**	**E-mail**	**Phone**
Prof. Luciano Baresi	POLIMI/Italy	luciano.baresi@polimi.it	
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	

Indika Priyantha, PhD	UvT / The Netherlands	pkumrawd@yahoo.com	
Prof. Willem-Jan Van Den Heuvel	Tillburg/The Netherlands	w.j.a.m.vdnheuvel@tillburguniversity.edu	
Giovanni Quattrocchi, PhD	POLIMI / Italy	giovanni.quattrocchi@polimi.it	
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Andreas Christoforou, PhD student	CUT / Cyprus	ax.christoforou@edu.cut.ac.cy	
Constantinos Stylianou, PhD	CUT / Cyprus	cstylianou@cs.ucy.ac.cy	
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Michalis Pingos, MSc student	CUT / Cyprus	michalis.pingos@cut.ac.cy	
Stefanos Manoli, MSc student	CUT / Cyprus	sp.manoli@edu.cut.ac.cy	

3. Discussion notes		
Topic and targets	Introducer	Time
- Progress of project - Execution of WP4, WP6 - Delays, deliverables - Planning of next steps - Upcoming workshops in Milan and DenBosch - Dissemination activities - Stakeholders meetings - Research plans - Extend WP4 to cover new and challenging topics → more than anticipated - Outline of matured research ideas - Management Issues - Closing Remarks	Prof. Andreas Andreou	

7. UvT Site Visit (June 10-16, 2018)

Workpackage:	WP4. Automation of build, deployment and operation activities			
Date: (MM/DD/YYYY)	06/10/2018	Time:		15:00-16:30
Facilitator:	UvT	Location:		Sint Janssingel 92, 5211 DA 's-Hertogenbosch, Netherlands

1. Subject / Short Description

Discussion on Smart Manufacturing: Current Technology

2. Attendees

Name	Department/Division	E-mail	Phone
Indika Priyantha, PhD	JADS / The Netherlands	pkumarawd@yahoo.com	
Constantinos Stylianou, PhD	CUT / Cyprus	cstylianou@cs.ucy.ac.cy	
Spyros Loizou, MSc Student	CUT / Cyprus	spyros.loizou@cut.ac.cy	
Michalis Pingos, MSc Student	CUT / Cyprus	michalis.pingos@cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time
• Big data Processing • Advance Robotics • Industrial Connectivity devices and services Smart Manufacturing and Industry 4.0 follows four design principles: • Interconnection • Information Transparency	Indika Priyantha, PhD	

• Technical assistance • Decentralized decisions		

Workpackage:	WP4. Automation of build, deployment and operation activities		
Date: (MM/DD/YYYY)	06/10/2018	Time:	17:00-18:00
Facilitator:	UvT	Location:	Sint Janssingel 92, 5211 DA 's-Hertogenbosch, Netherlands

1. Subject / Short Description

Discussion on Smart Manufacturing: Role of big data, IoT and other technologies

2. Attendees

Name	Department/Division	E-mail	Phone
Indika Priyantha, PhD	JADS / The Netherlands	pkumarawd@yahoo.com	
Constantinos Stylianou, PhD	CUT / Cyprus	cstylianou@cs.ucy.ac.cy	
Spyros Loizou, MSc Student	CUT / Cyprus	spyros.loizou@cut.ac.cy	
Michalis Pingos, MSc Student	CUT / Cyprus	michalis.pingos@cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time
Some of the prominent enablers in the current market scenario		

include:

- Artificial intelligence
- Blockchain in manufacturing
- Industrial internet of things
- Robotics
- Condition monitoring
- Cyber security

Workpackage:	WP4. Automation of build, deployment and operation activities		
Date: (MM/DD/YYYY)	06/11/2018	Time:	11:00-13:00
Facilitator:	UvT	Location:	Sint Janssingel 92, 5211 DA 's-Hertogenbosch, Netherlands

1. Subject / Short Description

Discussion on issues of extension of Product-oriented Configuration Language (PoCL) with 3D/CAD/Gamification modelling

2. Attendees

Name	Department/Division	E-mail	Phone
Indika Priyantha, PhD	JADS / The Netherlands	pkumarawd@yahoo.com	
Constantinos Stylianou, PhD	CUT / Cyprus	cstylianou@cs.ucy.ac.cy	
Spyros Loizou, MSc Student	CUT / Cyprus	spyros.loizou@cut.ac.cy	
Michalis Pingos, MSc Student	CUT / Cyprus	michalis.pingos@cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time

Unreal engine platform	Indika Priyantha, PhD
https://www.unrealengine.com The Unreal Engine is a game engine developed by Epic Games. We can use features in order ti implement 3d and augmented relality demos to extend current work and bring fancy gamification features above the PoCL.	

Workpackage:	WP4. Automation of build, deployment and operation activities		
Date: (MM/DD/YYYY)	06/11/2018	Time:	16:00-18:00
Facilitator:	UvT	Location:	Sint Janssingel 92, 5211 DA 's-Hertogenbosch, Netherlands

1. Subject / Short Description

Discussion on issues of an extended MDA for smart manufacturing: (i) Platform Independent Model (PoCL following our approach), and Platform Specific Model (Blueprints models)

2. Attendees

Name	Department/Division	E-mail	Phone
Indika Priyantha, PhD	JADS / The Netherlands	pkumarawd@yahoo.com	
Constantinos Stylianou, PhD	CUT / Cyprus	cstylianou@cs.ucy.ac.cy	
Spyros Loizou, MSc Student	CUT / Cyprus	spyros.loizou@cut.ac.cy	
Michalis Pingos, MSc Student	CUT / Cyprus	michalis.pingos@cut.ac.cy	

3. Discussion notes		
Topic and targets	Introducer	Time
The framework addresses four essential phases of the smart product lifecycle i.e., smart product ideation and customization (product co-design), production planning, production monitoring and production execution. The main focus of Spyros work is on the process of smart product ideation and customization, while Michalis' thesis is focusing on Production monitoring and the interaction with the shop-floor (production execution). The framework is conceptual, however, in the following. Spyros and Michalis are required to review the conceptual and implementation status of the blueprints models, and conceptually and technically define any extensions they may require. To view and study Blueprints in a user-friendly manner, Protégé is typically used.	Indika Priyantha, PhD	

Workpackage:	WP4. Automation of build, deployment and operation activities		
Date: (MM/DD/YYYY)	06/12/2018	Time:	11:00-12:30
Facilitator:	UvT	Location:	Sint Janssingel 92, 5211 DA 's-Hertogenbosch, Netherlands

1. Subject / Short Description
Discussion on Stakeholder Engagement in Data Driven Societies

2. Attendees			
Name	Department/Division	E-mail	Phone
Prof. Damian Andrew Tamburri	JADS / The Netherlands	d.a.tamburri@tue.nl	

Indika Priyantha, PhD	JADS / The Netherlands	pkumarawd@yahoo.com	
Constantinos Stylianou, PhD	CUT / Cyprus	cstylianou@cs.ucy.ac.cy	
Spyros Loizou, MSc Student	CUT / Cyprus	spyros.loizou@cut.ac.cy	
Michalis Pingos, MSc Student	CUT / Cyprus	michalis.pingos@cut.ac.cy	

3. Discussion notes		
Topic and targets	Introducer	Time

• <u>Prepare and share:</u>
    o Non-disclosure agreements
    o Memorandums of understanding
 	
    * Consider also General Data Protection Regulations.
 	
• Explain and emphasize on the benefits each stakeholder can gain
• Data may be published in scientific conferences or journals as part of research conducted in the project.
	Constantinos Stylianou, PhD	

Workpackage:	WP4. Automation of build, deployment and operation activities		
Date: (MM/DD/YYYY)	06/12/2018	Time:	15:30-17:00
Facilitator:	UvT	Location:	Sint Janssingel 92, 5211 DA 's-Hertogenbosch, Netherlands

1. Subject / Short Description
Discussion on gamification platforms applied in Smart Manufacturing

2. Attendees			
Name	Department/Division	E-mail	Phone
Prof. Damian Andrew Tamburri	JADS / The Netherlands	d.a.tamburri@tue.nl	
Indika Priyantha, PhD	JADS / The Netherlands	pkumarawd@yahoo.com	
Constantinos Stylianou, PhD	CUT / Cyprus	cstylianou@cs.ucy.ac.cy	
Spyros Loizou, MSc Student	CUT / Cyprus	spyros.loizou@cut.ac.cy	
Michalis Pingos, MSc Student	CUT / Cyprus	michalis.pingos@cut.ac.cy	

3. Discussion notes		
Topic and targets	Introducer	Time
Gamification platforms • Unreal Engine https://www.unrealengine.com • Unity https://unity3d.com/ • GoDot https://godotengine.org/	Spyros Loizou, MSc Student	

Workpackage:	WP4. Automation of build, deployment and operation activities		
Date: (MM/DD/YYYY)	06/14/2018	Time:	17:30-18:30
Facilitator:	UvT	Location:	Sint Janssingel 92, 5211 DA 's-Hertogenbosch, Netherlands

1. Subject / Short Description
Project Management Meeting

2. Attendees			
Name	Department/Division	E-mail	Phone
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Andreas Christoforou, PhD Student	CUT / Cyprus	ax.christoforou@edu.cut.ac.cy	
Prof. Luciano Baresi	POLIMI / Italy	luciano.baresi@polimi.it	
Prof. Damian Andrew Tamburri	JADS / The Netherlands	d.a.tamburri@tue.nl	

3. Discussion notes		
Topic and targets	Introducer	Time
Upcoming Activities: Next Workshop at POLIMI – Dates? Check dates in relation to WESOCAS2018 Partners should confirm their availability Workshop @ Como - dissemination - Workshop website * Material for upcoming workshop * leaflets, list of companies, new company for smart manufacturing, video. Financials: Current status? Transfer money from one partner to another? Check with Project officer Research: * microservices adoption model??? New survey???	Andreas Christoforou, PhD Student	

Workpackage:	WP4. Automation of build, deployment and operation activities		
Date: (MM/DD/YYYY)	06/15/2018	Time:	11:00-12:30
Facilitator:	UvT	Location:	Sint Janssingel 92, 5211 DA 's-Hertogenbosch, Netherlands

1. Subject / Short Description

Discussion on the features of Product-service systems, parts, components, etc. (part 2)

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Andreas Christoforou, PhD Student	CUT / Cyprus	ax.christoforou@edu.cut.ac.cy	
Prof. Damian Andrew Tamburri	JADS / The Netherlands	d.a.tamburri@tue.nl	
Indika Priyantha, PhD	JADS / The Netherlands	pkumarawd@yahoo.com	
Constantinos Stylianou, PhD	CUT / Cyprus	cstylianou@cs.ucy.ac.cy	
Spyros Loizou, MSc Student	CUT / Cyprus	spyros.loizou@cut.ac.cy	
Michalis Pingos, MSc Student	CUT / Cyprus	michalis.pingos@cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time
menuscreenshots.docx The file contains all the features of product service system.	Indika Priyantha, PhD	

Workpackage:	WP4. Automation of build, deployment and operation activities		
Date: (MM/DD/YYYY)	06/15/2018	Time:	15:30-17:00
Facilitator:	UvT	Location:	Sint Janssingel 92, 5211 DA 's-Hertogenbosch, Netherlands

1. Subject / Short Description

Discussion on smart manufacturing third model/Layer call Factory Floor Specific Model (FFSM) (part 2)

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Andreas Christoforou, PhD Student	CUT / Cyprus	ax.christoforou@edu.cut.ac.cy	
Prof. Damian Andrew Tamburri	JADS / The Netherlands	d.a.tamburri@tue.nl	
Indika Priyantha, PhD	JADS / The Netherlands	pkumarawd@yahoo.com	
Constantinos Stylianou, PhD	CUT / Cyprus	cstylianou@cs.ucy.ac.cy	
Spyros Loizou, MSc Student	CUT / Cyprus	spyros.loizou@cut.ac.cy	
Michalis Pingos, MSc Student	CUT / Cyprus	michalis.pingos@cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time
Smart factory simulators • Web4Industry • RobotDX • Flexsim Check if we can build scenarios providing real actions using smart		

factory simulators.	

Workpackage:	WP4. Automation of build, deployment and operation activities		
Date: (MM/DD/YYYY)	06/16/2018	Time:	11:30-13:30
Facilitator:	UvT	Location:	Sint Janssingel 92, 5211 DA 's-Hertogenbosch, Netherlands

1. Subject / Short Description

Discussion on TOSCA (Topology and Orchestration Specification for Cloud Applications)

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Andreas Christoforou, PhD Student	CUT / Cyprus	ax.christoforou@edu.cut.ac.cy	
Indika Priyantha, PhD	JADS / The Netherlands	pkumarawd@yahoo.com	
Constantinos Stylianou, PhD	CUT / Cyprus	cstylianou@cs.ucy.ac.cy	
Spyros Loizou, MSc Student	CUT / Cyprus	spyros.loizou@cut.ac.cy	
Michalis Pingos, MSc Student	CUT / Cyprus	michalis.pingos@cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time
Why Tosca? Advantages over other descriptors for cloud web services	Michalis Pingos, MSc Studentl	

Alternative descriptors for components, relationships and processes management	
Create process / Modify process -> Differences on specifications (???)	
Check: SEACLOUDS: http://www.seaclouds-project.eu/ DICE: http://www.dice-h2020.eu/	

Workpackage:	WP4. Automation of build, deployment and operation activities		
Date: (MM/DD/YYYY)	06/16/2018	Time:	14:30-16:00
Facilitator:	UvT	Location:	Sint Janssingel 92, 5211 DA 's-Hertogenbosch, Netherlands

1. Subject / Short Description

Brainstorming and discussion on smart manufacturing third model/Layer and features of Product-service systems.

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.cy	
Andreas Christoforou, PhD Student	CUT / Cyprus	ax.christoforou@edu.cut.ac.cy	
Indika Priyantha, PhD	JADS / The Netherlands	pkumarawd@yahoo.com	
Constantinos Stylianou, PhD	CUT / Cyprus	cstylianou@cs.ucy.ac.cy	
Spyros Loizou, MSc Student	CUT / Cyprus	spyros.loizou@cut.ac.cy	
Michalis Pingos, MSc Student	CUT / Cyprus	michalis.pingos@cut.ac.cy	

3. Discussion notes		
Topic and targets	Introducer	Time
What is TOSCA:

The Topology and Orchestration Specification for Cloud Applications (TOSCA) is an open-source language used to describe the relationships and dependencies between services and applications that reside on a cloud computing platform. TOSCA can describe a cloud computing service and its components and document the way those components are organized and the orchestration process needed to use or modify those components and services. This provides administrators with a common way to manage cloud applications and services, so that those applications and services can be portable across different cloud vendors' platforms.

https://searchcloudcomputing.techtarget.com

Check if we can use TOSCA as a middleware in our smart factory scenarios using gamification at user level and virtual actuators in the shop floor. | Spyros Loizou, MSc Student | |

8. POLIMI Site Visit (September 10-14, 2018)

Workpackage:	WP4. Automation of build, deployment and operation activities		
Date: (MM/DD/YYYY)	09/10/2018	Time:	14:00-16:00
Facilitator:	POLIMI	Location:	POLIMI, III floor, building 22, via Golgi, 42, Milan

1. Subject / Short Description

Discussion and experimentations on X-Spark and Azure

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Luciano Baresi	POLIMI / Italy	luciano.baresi@polimi.it	
Prof. Danilo Ardagna	POLIMI / Italy	danilo.aradagna@polimi.it	
Giovanni Quattrocchi, PhD	POLIMI / Italy	giovanni.quattrocchi@polimi.it	
Lambros Odysseos, MSc Student	CUT / Cyprus	lambros.odysseos@cut.ac.cy	
Michalis Pingos, MSc Student	CUT / Cyprus	michalis.pingos@cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time

• xSpark and Azure account setup
• Use of special CLI wrapper for initialization and execution
• Master Modifications
    o SparkContext
    o DAGScheduler
    o TaskScheduler
    o Addition of other components
• Worker Modifications		

o Worker Class	
o Containerize (docker)	
o Use of planner to assign cores to executors	
• Public & Private stage deadlines	
• Client program creates VMs on Azure	

Workpackage:	WP4. Automation of build, deployment and operation activities		
Date: (MM/DD/YYYY)	09/10/2018	Time:	17:00-18:00
Facilitator:	POLIMI	Location:	POLIMI, III floor, building 22, via Golgi, 42, Milan

1. Subject / Short Description

Future work on X-Spark and Azure

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Luciano Baresi	POLIMI / Italy	luciano.baresi@polimi.it	
Prof. Danilo Ardagna	POLIMI / Italy	danilo.aradagna@polimi.it	
Giovanni Quattrocchi, PhD	POLIMI / Italy	giovanni.quattrocchi@polimi.it	
Lambros Odysseos, MSc Student	CUT / Cyprus	lambros.odysseos@cut.ac.cy	
Michalis Pingos, MSc Student	CUT / Cyprus	michalis.pingos@cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time
• Use of Machine Learning techniques and approaches for the allocation of cores to executors and enhance accuracy		

furthermore	

Workpackage:	WP4. Automation of build, deployment and operation activities		
Date: (MM/DD/YYYY)	09/11/2018	Time:	14:00-16:00
Facilitator:	POLIMI	Location:	POLIMI, III floor, building 22, via Golgi, 42, Milan

1. Subject / Short Description

Discussion on Smart Manufacturing and Visualization

2. Attendees

Name	Department/Division	E-mail	Phone
Indika Priyantha, PhD	JADS / The Netherlands	pkumarawd@yahoo.com	
Lambros Odysseos, MSc Student	CUT / Cyprus	lambros.odysseos@cut.ac.cy	
Michalis Pingos, MSc Student	CUT / Cyprus	michalis.pingos@cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time
Unreal engine platform https://www.unrealengine.com The Unreal Engine is a game engine developed by Epic Games. We can use features in order ti implement 3d and augmented relality demos to extend current work and bring fancy gamification features above the PoCL.		

• Use of Unreal engine platform to build our scenarios providing the visualization and gamification.	

Workpackage:	WP4. Automation of build, deployment and operation activities		
Date: (MM/DD/YYYY)	09/11/2018	Time:	17:00-18:00
Facilitator:	POLIMI	Location:	POLIMI, III floor, building 22, via Golgi, 42, Milan

1. Subject / Short Description

Discussion on protégé platform and future work

2. Attendees

Name	Department/Division	E-mail	Phone
Indika Priyantha, PhD	JADS / The Netherlands	pkumarawd@yahoo.com	
Lambros Odysseos, MSc Student	CUT / Cyprus	lambros.odysseos@cut.ac.cy	
Michalis Pingos, MSc Student	CUT / Cyprus	michalis.pingos@cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time
• Protégé is a free, open source ontology editor and a knowledge management system. Protégé provides a graphic user interface to define ontologies. It also includes deductive classifiers to validate that models are consistent and to infer new information based on the analysis of an ontology. • We are going to use Protégé to build our blueprints.		

Workpackage:	WP4. Automation of build, deployment and operation activities		
Date: (MM/DD/YYYY)	09/12/2018	Time:	13:00-13:45
Facilitator:	POLIMI	Location:	POLIMI, III floor, building 22, via Golgi, 42, Milan

1. Subject / Short Description

Project Management Meeting Dossier-Cloud

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.ay	
Andreas Christoforou, PhD Student	CUT/Cyprus	andreas.christoforou@cut.ac.cy	
Prof. Luciano Baresi	POLIMI / Italy	luciano.baresi@polimi.it	
Prof. Damian Andrew Tamburri	JADS / The Netherlands	d.a.tamburri@tue.nl	

3. Discussion notes

Topic and targets	Introducer	Time

<u>Pending Activities</u>
    Closing meeting – where? Limassol?
                When? October?
    * Ask project officer if the closing meeting will be performed in January
 	
<u>Pending Deliverables</u>
Share tasks among partners
Adjusted deliverables that affected by extension of WP4
 	
Final Report-> Periodic Review report 2
	Andreas Christoforou, PhD Student	

Research Activities: Opportunities and possible collaboration with the Italian Industry: IBM, Moviri -> POLIMI is responsible to make the connection Financials: UvT should confirm the budget		

Workpackage:	WP4. Automation of build, deployment and operation activities		
Date: (MM/DD/YYYY)	09/13/2018	Time:	14:00-16:00
Facilitator:	POLIMI	Location:	POLIMI, III floor, building 22, via Golgi, 42, Milan

1. Subject / Short Description

Discussion on Cloud Services Synthesis

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Danilo Ardagna	POLIMI / Italy	danilo.aradagna@polimi.it	
Lambros Odysseos, MSc Student	CUT / Cyprus	lambros.odysseos@cut.ac.cy	
Michalis Pingos, MSc Student	CUT / Cyprus	michalis.pingos@cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time

• What is service synthesis?
    o Microservice vs Service-> definition
• How can it be reused from cloud?
    o Check API's marketplace (Mashape)
	Lambros Odysseos, MSc Student	

o Crawling algorithm (???)	
• How it aids the development process?	

Workpackage:	WP4. Automation of build, deployment and operation activities		
Date: (MM/DD/YYYY)	09/13/2018	Time:	17:00-18:00
Facilitator:	POLIMI	Location:	POLIMI, III floor, building 22, via Golgi, 42, Milan

1. Subject / Short Description

Discussion on microservices and DevOps

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Danilo Ardagna	POLIMI / Italy	danilo.aradagna@polimi.it	
Lambros Odysseos, MSc Student	CUT / Cyprus	lambros.odysseos@cut.ac.cy	
Michalis Pingos, MSc Student	CUT / Cyprus	michalis.pingos@cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time
• Use of microservices to reuse pieces of software in order to aid the development process * Check related research works carried out by POLIMI • Combine it with DevOps to ensure greater agility and operational efficiency	Lambros Odysseos, MSc Student	

Workpackage:	WP4. Automation of build, deployment and operation activities		
Date: (MM/DD/YYYY)	09/14/2018	Time:	09:00-11:00
Facilitator:	POLIMI	Location:	POLIMI, III floor, building 22, via Golgi, 42, Milan

1. Subject / Short Description

Discussion on services synthesis combining machine learning

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Danilo Ardagna	POLIMI / Italy	danilo.aradagna@polimi.it	
Lambros Odysseos, MSc Student	CUT / Cyprus	lambros.odysseos@cut.ac.cy	
Michalis Pingos, MSc Student	CUT / Cyprus	michalis.pingos@cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time
• Use of ML to match services through feature selection • Identify desired services with correctness and high accuracy • Most promising model is a shallow Neural Network • Evaluation of correctness? Multi-objective problem – Check the usage of Multi Objective Genetic Algorithms	Lambros Odysseos, MSc Student	

Workpackage:	WP4. Automation of build, deployment and operation activities		
Date: (MM/DD/YYYY)	09/14/2018	Time:	14:00-17:00

Facilitator:	POLIMI	Location:	POLIMI, III floor, building 22, via Golgi, 42, Milan

1. Subject / Short Description

Follow up research activities on Spark resource management and Big Data processing

2. Attendees

Name	Department/Division	E-mail	Phone
Prof. Andreas Andreou	CUT / Cyprus	andreas.andreou@cut.ac.ay	
Andreas Christoforou, PhD Student	CUT/Cyprus	andreas.christoforou@cut.ac.cy	
Giovanni Quattrocchi, PhD	POLIMI / Italy	giovanni.quattrocchi@polimi.it	
Lambros Odysseos, MSc Student	CUT / Cyprus	lambros.odysseos@cut.ac.cy	
Michalis Pingos, MSc Student	CUT / Cyprus	michalis.pingos@cut.ac.cy	

3. Discussion notes

Topic and targets	Introducer	Time

Background:
    Importance of Spark framework in the field of Big Data
    Summary on modifications performed on xSpark
    Discussion on future work and other research activities
Next Steps:
Microsoft account for CUT
Experiments replication
Cross checks results
Implementation of alternative resource management approach (ML)
Design of new experiments
	Andreas Christoforou, PhD Student	

9.   Conclusions

In the context of Workpakage-4, several actions and activities were organized and performed aiming to transfer scientific knowledge to CUT members in the area of Automatic monitoring of service delivery, Cloud resource management and decision support and/or automatic re-configuration

Firstly, CUT members participated in a series of three site visits in Milan, where researches from POLIMI delivered lectures related to research challenges in a number of topics, such as, microservices, containerization of cloud applications and the corresponded metrics, and DevOps strategies with social software engineering. Moreover, a comprehensive introduction on modeling social debt with FCMs project was made. A new series of site visits in the Netherlands followed. Researches from CUT attended various lectures given by UvT members that covered a wide range of aspects and research topics on cloud distributed systems, such as data science and intelligence sharing, big data and analytics.

Finally, in the 3-day workshop at CUT, members from POLIMI and UvT delivered lectures and presentations to members of the CUT group, as well as to other researchers and students. Also, a project management meeting was performed in which members from all partners discussed the progress of the project and the remaining steps towards final review. On the last day of the workshop the 3rd Stakeholders Meeting and Workshop on Cloud Computing, Software Services and Smart Data Processing was organized. Members from all partners presented the DOSSIER-Cloud project and part of its work to a group of targeted local stakeholders and finally a discussion for collaboration between the DOSSIER-Cloud members and the local stakeholders followed.

Two more site visits were organized and performed by CUT members in Italy and the Nederlands, in the context of the extension that was given to WP-4. During the site visits in both countries, additionally to the presentations, several discussions were held that contributed to the ongoing research. More specifically, in Italy, discussions were focused on the research studies in progress, the enhanced microservices adoption model and the extended resource management approach on Spark. During the site visit in the Nederlands, discussions were mostly focused on smart manufacturing and on distributed application development with the blockchain technology.