



**Title:** A Socio-economic Impact of SLA-Ready and Exploitation Plan

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## Executive Overview

SLA-Ready aims to increase the trust on Cloud Service Providers (CSP), leveraging the uptake of cloud services. The standardisation and transparency of Service Level Agreements (SLAs) is crucial to provide Cloud Service Customers (CSCs) with enough information about what services to use, what to expect from them and what to trust.

To this end, SLA-Ready provides a common understanding of SLAs for Cloud services with the creation of a Common Reference Model (CRM) that integrates SLA components, such as terminology, SLA attributes, Service Level Objectives (SLOs), guidelines and best practices.

The document reports on the socio-economic impact of SLA-Ready outputs and provides a detailed plan for their exploitation to ensure long-term sustainability based on real needs identified.

Particular attention is paid to the Common Reference Model (D2.4) and the SLA Marketplace, which have been the main focus of SLA-Ready workshops, questionnaires and interviews with stakeholders from the supply and demand sides aimed at demonstrating the tangible benefits of these outputs:

- **Common Reference Model:** implementation of best practices by cloud service providers reflecting the requirements of SME customers and resellers, helping to identify crucial SLA elements, and placing emphasis on the integration of Cloud SLA standards to boost uptake in the Digital Single Market.
- **SLA Marketplace:** including user-friendly resources providing good practice on the adoption of cloud service adoption and understanding of cloud SLAs.

The **Exploitation Plan** from SLA-Ready covers the next 24 months (2017-2018), using the SLA-Ready as the entry point. The Plan shows how partner expertise and future activities come together in a complementary way to reinforce joint exploitation as the basis for sustaining the outputs which meet market needs on both the supply and demand sides delivered as the “SLA-Ready Support-as-a-Service”.

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## *List of Acronyms*

AB	Advisory Board
CC	Cloud Customer
CD	Committee Draft (ISO/IEC)
CSA	Cloud Security Alliance
CSA STAR	Cloud Security Alliance's Security Trust and Assurance Registry
CSP	Cloud Service Provider
DIS	Draft International Standard (ISO/IEC)
EC	European Commission
ENISA	European Network and Information Security Agency
ETSI	European Telecommunications Standards Institute
EU	European Union
EU27	27 EU Member States
FDIS	Final Draft International Standard (ISO/IEC)
FP7	The Seventh Framework Programme (2007-2013)
H2020	Horizon 2020
ICT	Information and communications technology
IS	International Standard (ISO/IEC)
ISO	International Organization for Standardization
ISP	Internet service provider
JTC	Joint Technical Committee
MS	Member States
R&D	Research and Development
RTD	Research and Technological Development
SDO	Standards Development Organization
SLA	Service Level Agreements
SLO	Service Level Objectives
SME	Small and Medium-sized Enterprise
WD	Working Draft (ISO/IEC)
WG	Working Group
WP	Work Package

## 1 Introduction

The purpose of this deliverable is twofold:

1. Provide an analysis of the impact of SLA-Ready in relation to the European economy, characterising it on the demand and supply sides. The analysis uses both qualitative and quantitative data collected by SLA-Ready and provides a set of case studies describing socio-economic aspects in relation to the provision and consumption of cloud services.
2. Assess the sustainability of SLA-Ready Support as a Service based on technical, financial, marketing, and human support KPIs, presenting the final exploitation plans for the assets accrued. These assets comprise:
  - Common Reference Model
  - SLA Marketplace
  - SLA-Repository
  - Workshops for SMEs, including legal guidance sessions

### 1.1 Methodology

SLA-Ready combines a qualitative and quantitative approach to the assessment of its impact on the European economy. The assessment provides socio-economic qualitative case studies collected during the *SME workshops*, *customer interviews* and *testimonials*. The quantitative data is mostly based on the customer-focused *SLA Aid* and *questionnaire* for cloud service providers. The qualitative assessment allows us to determine the extent to which prevailing CSP practices conform to the Common Reference Model and thus address the most important concerns of customers from a technical, legal, economic and sociological perspective.

The figure below presents a snapshot of the methodology used to make a socio-economic impact assessment around the outputs of SLA-Ready.

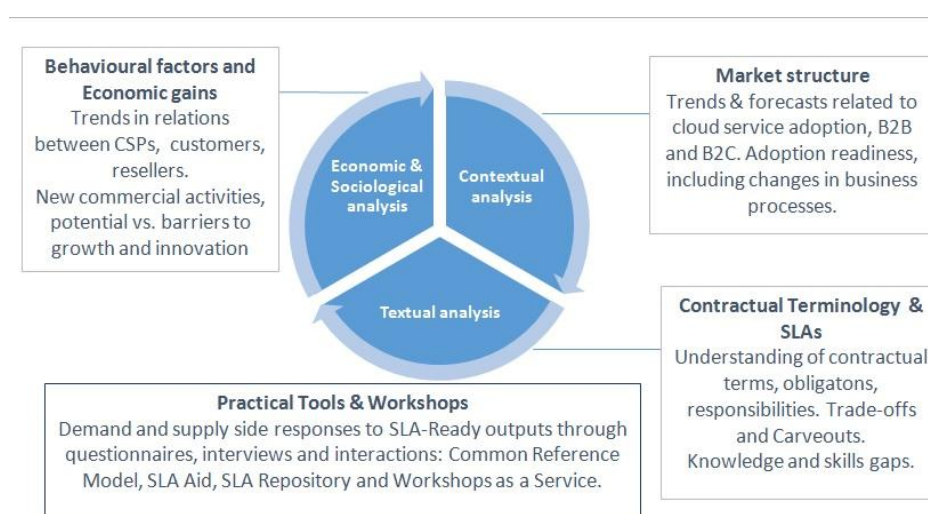


Figure 1: Methodology for Measuring Impact

From an economic perspective, we look at the economic features that SME customers and resellers are most concerned about, as well as new commercial activities and gains in diverse sectors based on the data collected. From a sociological perspective, we consider the requirements of SME customers in relation to priority general requirements, responsibility requirements, economic requirements, and technical service level objectives or SLOs, assessing the extent to which cloud service providers conform to these requirements in relation to the Common Reference Model (D2.4).

## 1.2 Summary of Main Impacts

Within the cloud ecosystem, SLAs contribute to providing transparency between providers and customers, enabling a better assessment of technical, legal and socio-economic requirements. Removing uncertainties increases customer understanding and therefore trust in the cloud service provider.

### **A common vocabulary and understanding**

SLA-Ready has contributed to the definition of best practices and services supporting customers in understanding complex concepts and legal terminology.

A common vocabulary is considered to be an enabler of uptake of cloud services. The purpose of the **Common Reference Model** is to promote a common understanding of SLAs and their attributes and greater standardisation on the part of cloud service providers. CRM elements are aligned with recognised standardisation initiatives, to which SLA-Ready has also contributed.

The resulting good and best CSP practices therefore become a multi-stakeholder reference point:

- Cloud service providers benefit from understanding the most important customer requirements along the cloud service life cycle, and particularly major concerns and difficulties.
- Cloud customers, especially SMEs with little or no bargaining power, have valuable access to best practices and legal guidance, addressing concerns that are key to building confidence and trust and therefore uptake of services.
- Cloud customers with the possibility to negotiate contracts (e.g. financial institutions, governments) have access to CRM guidelines on which to base terms and metrics on issues reflecting key market concerns. They can also help raise awareness of security and privacy issues and ultimately enable them to filter down to standard contracts.

### **Increasing customer knowledge and improving understanding of cloud SLAs**

SLA-Ready has offered a practical guide to the entire cloud service life cycle, facilitating customers in making a comprehensive assessment of all potential risks from the very beginning. The SLA Aid gives customers a customised checklist and roadmap for their



adoption of cloud services. Most importantly, it puts the focus on the acquisition phase as the most critical one in the lifecycle to ensure customers scrutinise and compare contracts and carry out a proper assessment of obligations, risks and responsibilities, from service set-up to termination.

The SLA Aid plays a key role in breaking down entry barriers to cloud adoption by accelerating the time it takes to improve SME customer knowledge. The focus on security and compliance can also help address the lack of expertise in assessing a provider's security measures.

## 2 SLA-Ready catalogue of services and outputs

The outputs from SLA-Ready have made an impact in several different ways with regard to the challenges of Cloud SLAs. These outputs form a catalogue of services, for which an exploitation and sustainability plan is provided in this document.

### SLA-Ready Common Reference Model

#### Purpose

Based on the user requirements analysis (D2.1 & 2.2) and with detailed validation, the Common Reference Model (D2.3 & 2.4) contains a set of SLA elements that the consortium (via user community input from surveys) considered highly important for SMEs willing to embrace the full potential of cloud computing. The CRM integrates a set of SLA components, such as common vocabularies, SLO metrics and measurements, as well as best practices and relevant standards needed to fill the gaps identified in the current SLA landscape. The SLA Common Reference is the basis on which all SLA-Ready services are based.

#### Testimonials

*"Our viewpoint is that a common reference enables us to easily access the market since all actors will follow the same rules. Dealing with customers who understand these SLAs would involve less time for the company and lower cost to cover legal issues as guidance"*

Carlos Rubia Marcos, Wellness Telecom, S.L.

*"The CRM is an excellent first step towards providing a standardised SLA specifically for this and contributing to 7Bulls reaching a broader market. We deeply evaluated Common Reference Model and plan to use it as the basis in our SLA for our newly introduced applications."*

Pawel Skrzypek & Katerina Materkia, 7Bulls

### SLA-Ready Hub & SLA Marketplace

#### Purpose

The main entry point for supporting SMEs in understanding and managing cloud SLAs

through the major outcomes from SLA-Ready: SLA-Aid, Use cases, SLA Repository.

### Testimonials

*"The SLA Marketplace can play an instrumental role in helping SMEs, and organisations of all kinds for that matter, in understanding where one should look or what one should check either before engaging or during the implementation of cloud service agreements."*

Andrei Kelemen, ClujIT

*"The SLA Aid is appropriate to both customers and providers, and as someone who has built a SaaS business and needed to offer a SLA, I only wish I had this kind of support."*

Frank Bennett, iCloud Ltd & Deputy Chairman and Member of Governance Board Cloud Industry Forum (CIF)

## SME Workshop series

### Purpose

Four workshops to National Trade Associations and ICT clusters in Europe meeting a real need for such informative events where SMEs have access to free advice on security and legal issues.

### Testimonials

*"One of the most valuable workshops I participated in during the past year."*

Paul Sipos, Endeva

*"It's very important to have these types of events to disseminate the new directives and to exchange stories on how cloud is being used to deliver services to clients."*

Alex Rotaru, Altom Consulting & Board of Directors, ClujIT

## SLA-Readiness Index

### Purpose

As outlined in D2.4, a key output of the SLA-Ready project is the SLA-Readiness Index. This is a quantitative metric that could be used by cloud customers, mainly SMEs, to assess at a glance the CSP's SLAs, i.e., a high-level metric designed to assess CSP alignment with the SLA-Ready Common Reference Model.

With the SLA-Readiness Index, we can go beyond the concept of a SLA repository which offers a "raw" collection of SLAs. The entries in the SLA-Repository could become too granular for SMEs who are only willing to have a quick understanding of the offered CSP SLAs before going into more detail. For this reason, the SLA-Ready project has proposed the SLA-Readiness Index, which transforms the SLA-Repositories into a collection of cloud SLAs analysed according to the elements defined by the CRM.

The SLA-Readiness Index has been published as a prototype and potential future

exploitation of this is discussed below.

#### Testimonial

*“SLA-Ready provides a model and establishes a basis for standardised Service-Level Agreements for cloud services that permit businesses and users to make informed decisions regarding what they’re buying and the guarantees that go with it,”*

Gloria Diaz, CONETIC

### SLA Standardisation

#### Purpose

To support the uptake and adoption of standards in the area of SLAs, the SLA-Ready project has contributed to relevant cloud SLA standardisation initiatives. More specifically, SLA-Ready contributed to ISO/IEC WD 19086-2 by suggesting the inclusion of SQOs (Service Quality Objectives) into the conceptual model. Furthermore, it has provided a contribution related to validating the proposed model with respect to the security and privacy metrics being documented in ISO/IEC 19086-4 as part of the Security and Protection of Personally Identifiable Information components. Additionally, the project has contributed to ISO/IEC 19086-3 based on the CRM and its good practices. Particular emphasis was put on highlighting the SME-perspective, contrary to the CSP-focus put in the reviewed version of the draft standard.

All submitted comments to ISO/IEC WD 19086-2 were accepted and published as part of ISO/IEC CD 19086-2. Comments to ISO/IEC DIS 19086-3 were accepted by the ISO secretariat and will be included in the new version of the document after the balloting will take place after the finalisation of the SLA-Ready project. Similarly, the current version of the ISO/IEC CD 19086-4 will be reissued and contributions of SLA-Ready project will have an impact on the development of the standards even after the finalisation of the project.

## 3 Impact of SLA-Ready on target stakeholders

### 3.1 Impact of SLA-Ready outputs on National Trade Associations, ICT clusters and enterprise associations

SLA-Ready has identified a need within associations that support SMEs for guidance on good practices related to issues such as innovation, business, markets and risks. Cloud computing is a building block for the European Digital Single Market, including for IoT, data analytics and 5G communications so it is therefore important for these organisations to grasp the opportunities that cloud computing offers. National Trade Associations, ICT clusters and other business associations play a key role in providing information on topics such as cloud SLAs through online support and events.

SLA-Ready has promoted the project outputs for SMEs to SME associations mainly pertaining to DIGITALEUROPE and the Digital SME Alliance through a series of workshops. These events have focused on the CRM, the SLA Aid in the SLA-Ready Marketplace, and providing legal advice. In the following section we focus on the needs of two associations: ClujIT, Romania; and CONETIC, Spain.

#### **CASE STUDY: Cluj IT, Romania**

Cloud SLAs are not on the usual checklist of SMEs, at least not in Romania. Cloud services are still rarely used, although the adoption is increasing. As adoption of cloud services increases and becomes a stable of business models, more companies will need guidance on best practices and practical advice on compliance. As a cluster organisation (built on the triple helix model), Cluj IT promotes change and innovation so that the software industry in Cluj has the foundation for sustainability/long term prospects. Part of this vision is the incorporation of cloud services which, from an economic stand point, are potent differentiators.

#### **The impact of SLA-Ready**

*“Any initiative that brings on the business agenda such a topic should be welcomed and embraced. It is the main reason why Cluj IT set up the organization of the SLA-Ready workshop, this way contributing towards building the awareness about cloud services in general, and about SLA on cloud services in particular.*

*The SLA Marketplace can play an instrumental role in helping SMEs, and organizations of all kind, in understanding what one should look for or what to check either before engaging or during the implementation of cloud service agreements. Understanding means trust and this will consequently increase the chances of adoption of a modern tool, that gives business agility, a much needed feature especially for smaller companies and startups.”*

Andrei Kelemen, Executive Director, ClujIT & SLA-Ready Advisory Board

#### CASE STUDY: CONETIC, Spain

In spite of being aware of their benefits, 80% of Spanish SMEs don't use cloud services because they don't sufficiently understand the service provision contracts that must be signed with their provider. These companies do not have enough time or resources to invest in new technologies or in building the technical and legal knowledge required for their adoption.

Spanish businesses are aware of the opportunities and benefits offered by the adoption of new technologies, and the flexibility and competitiveness involved in working with cloud environments. The adoption of cloud technologies by Spanish SMEs are vital not only as an objective of modernization, but also as an innovation strategy: *"It is necessary that the digital transformation reach all productive sectors, not only to facilitate economic recovery and job creation, but also as a means for interaction between enterprises, with citizens, with other organizations, and with the ecosystem, which is already digital."* Jorge Perez, Digital Economy Director at Red.es

*"In a European Digital Single Market, the development of standard contracts for the provision and contracting of cloud services won't only help to improve the productivity of Spanish SMEs, but will also help them to start doing business abroad."*

Juan Millan, partner of Gedeth Network and CONETIC member.

#### The impact of SLA-Ready

*"SLA-Ready provides a model and establishes a basis for a standard of Service-Level Agreements for cloud services that permit businesses and users to make informed decisions regarding what they're buying and the guarantees that go with it. This strives to address issues such as lack of relevant knowledge, use of complex terminology, the lack of standards for comparing offers, the use of English as principal language, or the lack of information between the rights and obligations of the users and the providers...that arise from current contracts."* Gloria Diaz, CONETIC & SLA-Ready Advisory Board

As Table 1 shows, in addition to workshops, that SLA-Ready has also pursued a number of actions to facilitate SMEs in understanding the importance of transparent SLA contracts for their business, such as:

- Promoting the marketplace to members through newsletters and social media promotion.
- Promoting support to the creation or consolidation of website sections on "Cloud SLA" which would link to the SLA Marketplace.
- Creating new language versions of SLA-Aid.

Table 1 SLA-Ready engagement with SME and enterprise associations

Organisation	Engagement
AGEFE, Portugal	Provision of Portuguese version of SLA-Aid (December 2016)
AGORIA, Belgium	Promotion of final event to network through newsletter (November 2016)
AMETIC, Spain	Workshop (October 2016)
ANITEC, Italy	Provision of Italian version of SLA-Aid (December 2016)
ClujIT, Romania	Workshop (November 2016) F2F meeting x2 Promotion of SLA-Ready in newsletters Promotion on website under consideration Potential for provision of Romanian language version of SLA-Aid Participation at final event (December 2016) Invitation to Cluj Innovation days 31/3-1/4/2017
Cloud Industry Form, UK	Participation at Ametic workshop (M22) & final event (December 2016) Discussion of promotion of SLA Marketplace
CONETIC, Spain	Promotion through 3 newsletters and 1 press release Workshop (November 2016) Promotion on website under consideration Invitation for follow up workshop in 2017
Euro CIOs, EU	Participation at final event (December 2016)
FFI, Finland	Promotion on website under consideration
ITAS, Slovakia	F2F meeting (October 2016) Confirmed interest in back-linking from website to SLA-Ready.eu Participation at final event (December 2016) Interest in workshop in 2017
IVSZ, Hungary	Promotion on website under consideration
StartUp Farm, Brazil	Provision of Brazilian version of SLA-Aid (December 2016)
TechUK, UK	F2F meeting (September 2016) Promotion at Cloud Clinic (October 2016) Invitation to contribute to marketplace at Cloud Clinic workshops in 2017.
UKITA	Participation at final event (December 2016)

### 3.2 Impact of SLA-Ready outputs on SMEs: Cloud Service Customers and small resellers

In this section, we provide a qualitative assessment through selected case studies illustrating socio-economic aspects for SME cloud service customers and small-scale resellers.

Commonly identified benefits of using cloud services emerge from SME interactions:

- Real-time scalability.
- No longer having to worry about redundancy & disaster recovery.
- Cloud and mobile apps increase productivity. Cloud-based email services and invoicing are also beneficial for SMEs.

- Increased agility and significant market growth potential through ability to reach different types of users with access to Internet.

Despite the general consensus on the benefits of cloud services, many SME customers and resellers still encounter significant socio-economic barriers in using them. One point worthy of note in the cloud ecosystem is the very different relationships from a reseller perspective. The purely formal and distant relationship with the cloud service provider has clear advantages for the provider: no negotiation costs and reduced liabilities. However, the very close relationship with the reseller's customers has no clear advantages as it increases negotiation costs, liabilities and responsibilities. Evidence suggests that the main business driver comes from the opportunity to innovate and extend the company's service portfolio.

The following case studies focus on SMEs that participated at SME workshops.

#### CASE STUDY – Parking Plus

Parking Plus, <https://www.parkingplus.ro/>, is a market innovator providing easy and secure access to private garages. It offers a smartphone mobile application, payment through mobile phones, and secure access box for secured access to private areas shared with others. Partnered with T-Systems, this SME also works on smart city applications.

Cloud service provider: Major US provider.

##### Economic aspects

- Small firms have no negotiating power for cloud SLAs but need to select from providers always with a "take-it-or-leave it" contract.
- Lack of clarity on customer versus provider responsibilities, e.g. security breaches and accountability.
- Practices for service credits, where there is no financial reimbursement, do not consider impact on company's reputation when a service is not delivered due to an outage.

##### Sociological aspects

In this case, the end-user decides on the choice of cloud service provider. Decisions are also taken with legal advisors on both sides but the teams involved in the adoption process do not always have sufficient skill sets, e.g. legal and technical, which represents a **sociological issue** hurdle to adoption.

Christian Ureche, Parking Plus Managing Director, Romania

### CASE STUDY - Hypermedia

Services include: media and broadcasting, online entertainment, cloud computing services, eCommerce, eLearning. Hypermedia, <http://www.hpm.ro/>, started its journey to the cloud as a customer but now acts as reseller of public cloud services to its customers.

#### Economic aspects:

- SLA essentials are not just about availability but also security as they both impact on the ability to provide a service for which the company has sole responsibility.
- The economic impact of dealing with different relationships as a customer on the one hand and in serving their own customers on the other. As a customer, the company has a very impersonal relationship with the provider, but as a reseller it has to establish very close relationships with customers. This involves a lot of negotiation. To address this challenge, the company is working on templates that capture customer requirements-

#### Sociological aspects

- Lack of competence in legal aspects. The company is working on templates based on customer-tailored approaches to meet all their requirements. This also has an **economic impact**. It also implies very different relationships: impersonal with the cloud service provider but a very close relationship with customers, where there is a lot of negotiation.

Cosmin Perumb, Hypermedia



#### CASE STUDY – Beia Consult International

Beia Consult International, <http://agile.ro/beia/>, is an SME that sells M2M/IoT Telemetry services (<http://eng.beia-telemetrie.ro>) in a SaaS model with a basic SLA.

##### Economic aspects

- As a customer, Beia Consulting International purchases cloud services (Azure, AWS, Digitalocean Docker) but has difficulty in monitoring what the providers actually deliver and assessing the extent to which they comply with SLAs.
- As a provider, the company will need to pay increasing attention to SLAs with regards to customers operating as critical infrastructures, including compliance with the EU Network and Information Security Directive.

*“The Common Reference Model and SLA Aid are very useful tools in making an informed decision on which cloud service provider to use and how to meet changing customer SLAs.”*

George Suciu, R&D Innovation Manager, Beia Consult International, Romania and SWITCH project

With regards to best practices, the Common Reference Model has a clear role to play also for SME resellers.

*“IN2 is a micro company that is both a cloud customer of hosting services and small cloud provider for our social media platform, putting us in a unique position to assess the benefits of SLA-Ready. The Common Reference Model has helped us understand the crucial elements of a cloud SLA, including minimum compliance levels and how to manage the complete service lifecycle. I would highly recommend SLA-Ready to small firms moving to the cloud.”* George Ioannidis, Director of IN2

##### Qualitative analysis – provider perceptions of customer needs

Looking the data collected from a Cloud service life-cycle perspective, it appears that SMEs customers are more concerned about the operational stage of a cloud service, rather than the acquisition of the service. Comparatively, the termination phase interests them even less. This information is very significant as it implies that, at least from a provider perspective, not enough attention is paid to the initial phases of a cloud engagement, as they could be committing themselves to unfavourable terms and exposing themselves to greater risks.

One advantage of the ‘click-through’ approach often promoted by providers is that it speeds up service set-up. However, customers need to scrutinise contractual terms and be able to compare different cloud services **before** sign-up. They need to look at the

nature and effect of the terms, such as reviewing data protection, evaluating security and making other risk assessments. The SME Workshops have also clearly demonstrated the widespread need of legal guidance, including a better understanding of the GDPR.

SLA-Ready has enabled this shift of focus through its SLA Aid and legal sessions at its workshops. An obvious recommendation for policy makers is to allocate funding or implement local and national schemes on legal guidance to SMEs, also with regard to the forthcoming GDPR.

#### *4 Impact of SLA-Ready outputs on Cloud Service Providers*

The SLA-Ready state-of-the-art analysis (D2.1 and D2.2.) focuses on prevailing provider practices from a technical, legal, economic and sociological point of view as the basis for the Common Reference Model. This analysis highlighted significant gaps particularly between the requirements of SME customers and providers offering standard contracts, couched in provider-favourable terms and designed for high-volume, low-cost commoditised services on shared multi-tenant infrastructures.

The direct interaction with providers and customers has helped to validate these findings and determine the extent to which provider practices on Cloud SLAs conform to the model. SLA-Ready has also been able to identify a new breed of SME cloud service providers, often looking to create a niche market, facing different challenges when drawing up an original SLA.

##### **Drawing up Cloud SLAs: provider perspectives**

SME providers face many challenges when drawing up an original SLA. One option could be to assess the SLA of another provider (i.e. a competitor) and draw up a comparable SLA or come up with their own SLAs. However, both approaches are flawed. Creating an original SLA is expensive, while creating a comparable SLA with minor adjustments may infringe copyright, and the SLA may be flawed. Aspects that go into the development of an SLA include: the cloud service offer, the customer using the service, prevailing legislation, standards, and market forces. A key question is: who can be trusted as a reference when compiling all of these aspects?

One SME provider identified four factors determining the definition and implementation of an SLA from a supply-side perspective:

1. **Benchmark:** setting realistic levels based on other examples of service provision rather than on open figures that are hard to achieve, thus steering discussions around benchmarked and known levels.
2. **Customer needs:** making a commitment to understanding and satisfying customer needs, especially critical elements, helps prioritise the most important ones.

3. **Provider capacity:** making a realistic assessment of the capacity to meet customer needs and even declining to provide a service can also be a trust builder with customers.
4. **Reporting:** keeping track on KPI results related to the defined SLAs, which need to be reported to customers can, and evolving the KPIs can help to optimise operations.

To illustrate these multi-faceted challenges, we provide a set of case studies from SME providers based on SME workshop inputs, the CSP questionnaire, and contributions to the SLA Repository.

#### CASE STUDY – Wellness Telecom

Wellness Telecom is an SME providing services to customers moving applications to the cloud. Its focus is on intelligent sensors, telecommunications, cyber security, big data and analytics. It has recently become a cloud service provider developing its own services (Unified Communications).

##### Economic aspects

- The company is targeting customers who do not wish to use services of major market players (e.g. AWS, Microsoft Azure) or are generally reluctant to move data or services to the cloud. Such an approach requires the company to focus on specific requirements and therefore also specific SLAs typically on a case-by-case basis. This results in a long process for everyone involved before financial gains can be made.
- Additional costs are accrued on both sides because of the legal guidance required to address complex terminology.

##### Sociological aspects

- Lack of understanding of the implications of moving to the cloud and of legal expertise, with SME customers not having a legal department, slow down the adoption process and therefore time to benefit from cloud services.

*“A common reference enables us to access easily to market since all actors will follow the same rules. Dealing with customers who understand these SLAs would involve less time for the company and lower cost to cover legal issues as guidance.”*

Carlos Rubia Marcos, Project Manager, Networks, Systems and Cloud, Wellness Telecom,S.L. & ENTICE project, <http://www.wtelecom.es/?lang=en>

## CASE STUDY – 7Bulls

7bulls is a cloud application provider and also as a software house company, which offers cloud applications for other companies. The current application (DAM - Digital Asset Manager) targets business clients.

The “SLA” is based on the framework agreements with customers and planned longer term relations. Face-to-face negotiations take place with customers.

### Socio-economic aspects

- A model with a standardised set of elements like the CRM can facilitate companies like 7Bulls in drawing up SLAs for new services/applications on a “one-to-many” basis (mass market).
- Standardised models like the CRM are also useful for the customers of resellers offering SaaS-based applications in the cloud, as well as to law firms in Poland specialising in IT agreements and contracts.

The CRM may also be applicable to the company’s complex quality assurance process for IT systems, including definitions and SLO metrics.

*“We deeply evaluated Common Reference Model and plan to use it as a base for our SLA for the newly introduced applications. We also recommend usage of the Model to our customers (that offer cloud applications in SaaS model) and to legal entities in Poland, which specialise in IT agreements and contracts. We plan to go even further, to include some elements of the Common Reference model (eg. definitions, SLO metrics) into complex quality assurance process for IT systems developed by 7bulls.com”*

Pawel Skrzypek, Software Architect for Cloud & e-commerce solutions & Katerina Materkia 7Bulls, Poland, <http://www.7bulls.com/>.

## CASE STUDY – Fusiona

Fusiona, <http://www.fusiona.cl/>, is a holding company of five businesses providing different types of digital business services: Strategy, creativity and audiovisual production; web and mobile development; Security and highly complex integrations; Internet of Things Experience: User Experience Lab. It acts as a reseller.

### Sociological aspects

- Defining SLAs for all services provides a solid starting point for negotiation benefitting both customer and provider that saves a lot of time, money and energy.
- More time and effort can be given to critical services.
- Clearly defined SLAs increase transparency also during the service lifecycle, for example when monitoring performance, leaving no room for different interpretations of service level objectives.
- Because every business relationship is based on trust, having SLA commitments and delivering on them, helps build trust with the customer. While there are other factors involved in building trust in a commercial relationship, SLAs set the rules for evaluating elements like performance.

### Socio-economic aspects

- From an operational perspective, SLAs are important in determining the size of the team required to ensure compliance with the SLAs. For example, a 24/7 service requires a larger team than a 8/5 service and also come with a different economic value determined during the negotiation phase.

*“SLA-Ready outputs consider different realities across the world so the probability that they will fit our particular scenario is very high as is their reliability. All of these will help to develop the trust in the client-provider relationship”*

**Source:** Pablo Altamirano, Fusiona

SLA-Ready has also collected evidence on the economic advantages of maintaining the status quo in terms of SLAs offered. One major market player stated a preference on keeping standard contracts to keep down costs for both the provider and SME customers. In this particular case, we noted a willingness to adapt the actual services rather than change contractual terms with SLAs that address customer concerns. This is further evidence of the need for prospective customers to make a proper risk assessment and understand their liabilities in order to fully benefit from cost benefits.

The qualitative assessment with cloud service providers also revealed some interesting perceptions on the value of making their SLAs public. In some cases, providers consider their practices as falling short of the CRM elements and prefer not to appear “publicly immature in their approach to SLAs”. In other cases, providers do not see a profit or business value in making SLAs public even when they offer enhanced security and privacy measures for the government sector.

The latter view is interesting in view of the recommendation made by Millard et al. (Cloud Computing Law, December 2013) to encourage a greater variety of cloud services, from cheap public clouds not using personal or commercially confidential data to more expensive ‘personal data clouds’, and even more costly high-security, auditable private or community clouds, including services targeting specific sectors (e.g. finance and healthcare).

#### 4.1.1 Qualitative Impacts of SLA-Ready Outputs

##### **Qualitative Impacts of SLA-Ready Common Reference Model**

- Access to the SLA-Ready Common Reference Model makes available a standardised approach for preparing and maintaining cloud SLAs. The CRM is an excellent first step towards reaching a broader market, especially for SMEs by reducing the time and effort required to draw up the SLAs” Katerina Materkia, 7Bulls
- The CRM elements provide an excellent presentation of all aspects that should be included in an SLA. Greater standardisation means increased transparency, which benefits both customers and providers.
- *“At 7bulls.com, have a long history working with open source software and for us transparency offered by Common Reference Model and ability to honestly and transparently compare SLA offered by various cloud providers is a real benefit of the project. In our opinion it will be very valuable for cloud services' customers, but also for cloud services and applications providers. Transparency will support good competition and general acceptance of cloud computing among various companies.”* Katerina Materkia, 7BullsFor new entrants, the CRM facilitates access to market by fostering common approaches to SLAs that increase clarity over terminology and reduce need for additional, external guidance.
- Better customer understanding of SLA elements would reduce the time to complete the contractual agreements and also reduce costs of legal guidance.
- Customers also benefit from common terminology with reduced time to compare different SLAs and can focus more on the actual service offer.

## Qualitative impacts of the SLA Aid: provider and customer

Drawing up an SLA is a balancing act of what the CSP is committing to the customer and upon which the customer makes a decision with due consideration to existing legislation, e.g. Data Protection Act 1998 in the UK and the forthcoming EU GDPR. This is a highly complex subject for SMEs who do not have in-house legal teams or money to spend on expensive external legal advice.

With the increasing reliance on cloud services to deliver vital business activities, **the SLA is the one document that needs careful inspection**. The challenge for many customers and particularly SMEs, is the time and cost to understand the terms of the SLA and to know if it is right for them. On the other hand, cloud service providers need to offer SLAs that are fair and transparent. Who do they turn to for that advice? The SLA Aid is appropriate to both the customer and provider.

*“As someone who has built an SaaS business and needed an SLA, I only wish I had this kind of support.”* Frank Bennett, iCloud and Cloud Industry Forum.

### 4.1.2 Conformance with CRM Elements: Customer requirements versus provider practices

The SLA-Ready quantitative analysis is based on the SLA Aid for customers and the online questionnaire for providers to evaluate conformance with the Common Reference Model.

Significant gaps still prevail. On the one hand, we have SME customers whose requirements often reflect key market concerns which are often accommodated in negotiated contracts<sup>1</sup>: clearly defined responsibilities and obligations, service level metrics, and security and privacy measures. The advantages of a ‘click-through’, standard contract approach are clear for service providers: elimination of negotiation costs, reduced legal liabilities and removal of other risks.

On the other hand, we have providers who only partially meet these needs, or not at all. One can conclude from this, that the large SME market has yet to benefit from changes in standard terms filtered down from negotiated contracts. Yet, free or low cost cloud services do not mean risk free.

However, this state of play could change through:

- Widespread use of the SLA Aid with its focus on the acquisition phase, helping to evaluate security measures and assess risks.
- SMEs and start-ups working together on common priority requirements to be included in the cloud service contract through the support of ICT clusters.

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<sup>1</sup> See for example, C. Millard, ‘Cloud Computing Law’, Oxford University Press, December 2013, pp. 73-74.

- Increased use of the Common Reference Model by cloud service providers providing guidance on best practice implementation and relevant standards.
- Regulatory actions filtering up requirements into cloud SLAs.

To understand how Cloud SLAs could be improved, we compare the top five priorities for SME customers with current provider practices.

#### 1. CRM Element 5: Cloud SLA Definitions

Q. Should relevant definitions for terms used in the SLA be provided?

**Sociological Impact:** increase customer understanding.

73% of SME respondents consider this to be a high priority CRM element. However, only 50% of the CSP respondents provide such definitions that could help customers understand the provider's SLA and avoid unnecessary ambiguities. A CSP best practice would be to specify roles and responsibilities in the cloud SLA aligned with the definitions of standards like ISO/IEC 17788 and ISO/IEC 17789.

#### 2. CRM Element 15: Service Credit

Q. Should the SLA provide a clear explanation of whether service credits can be provided?

**Economic Impact:** potential losses accrued by customer due to service outage, including reputational damage.

67% of SME respondents consider this to be a high priority CRM element, with only 50% of CSP respondents providing clear definitions. A good practice would be to allow agreements on reasonable terms of remedies and commitments for zero-repeat, and better still the right to claim full damages (except to the extent of being non-insurable).

#### 3. CRM Element 16: Service Credits Management

Q. Should the SLA include the conditions under which service credit is provided?

**Economic and sociological impact:** financial losses, confusion about actual service performance and burden of making a claim. Where service credits are granted, they typically provide credit for future monthly fees without any pay-out to the customer.

67% of SME customers consider this a high priority requirement with only 50% of CSP respondents meeting it. A customer needs to know, assess and understand what remedies it can fall back on in the event of an incident and related damages.

A best practice would be to provide continuous monitoring and pro-active incident management notification with incurred damages paid out in financial funds as part of the agreement.

#### 4. CRM Element 25: General SLOs

Q. Should the SLA provide a clear specification of general SLOs?



**Sociological impact:** clarity of contractual terminology and service levels, which are important to assess already in the acquisition phase in a comparable way.

This is a high priority for 67% of the SME respondents and provided by most of the CSP respondents (80%). A set of general SLOs, including accessibility, availability, termination of service, governance, certifications and support, should provide enough information for a customer to make an initial comparison between service offers. However, it also requires mechanisms to verify actual levels delivered. Therefore the specified general SLOs should be compliant with the core requirements in ISO/IEC 19086-2, and better still, metrics defined should be based on a standardised model, e.g. ISO/IEC 19086-2.

## 5. CRM Element 30: Personal data protection SLOs

Q. Should the SLA include specifications on personal data protection SLOs?

**Socio-economic impact:** low understanding of legal obligations, including readiness for the GDPR, is a recurring theme in SLA-Ready findings as the vast majority of SMEs lack expertise in this area. Without clarity, SME customers risk committing themselves to unfavourable terms and exposure to legal risks, including breach of legal/regulatory obligations (resulting in fines, civil or even criminal liability).

A sharp contrast is noted between the importance of this CRM element for SME respondents (60%) and inclusion in provider cloud contracts (20% of respondents).

Personal data management includes issues such as consent and choice, limitation, accountability, personally identifiable information (PII) collection, use, retention and/or disclosure, and privacy compliance. SLOs for PII should be considered as a critical element for customers, who must ensure compliance with legal obligations. It is therefore very important that customers understand roles and responsibilities related to personal data protection (including applicable certifications, codes of conduct and defined SLOs). A good CSP practice is compliance with the core requirements in ISO/IEC 19086-4. A best practice is to specify SLOs contained in additional documents like the EC's *SLA Standardisation Guidelines*, with metrics based on ISO/IEC 19086-2.

Other CRM elements considered important from a customer perspective (60% of respondents but in most cases provided by 50% of CSPs surveyed) include **SLA change notification** (CRM element 18), **choice of law** (CRM element 3), **contact availability** (CRM element 14), **service level reporting** (CRM element 20), **feasibility of specials and customisations** (CRM element 22) and **service reliability SLOs** (CRM element 27). From a legal perspective, common practices around choice of law can easily cause confusion amongst customers as to rights and obligations, while little relevant knowledge of the implications of agreeing to a particular jurisdiction also constitutes a knowledge gap for customers. The socio-economic impacts for these elements are similar to those described above.

**Security SLOs** are of medium importance to the customers surveyed (54%) but only provided by a few of CSP respondents (CRM element 29). While the specification of security commitments is expected to become part of standardised SLA templates in the near future, it is important for customers to understand how specified security SLOs relate to their requirements, including regulatory compliance. The best practice is compliance with ISO/IEC 19086-1, ISO/IEC 19086-2 and ISO/IEC 19086-3, providing the customer with details such as SLO/SQO monitoring, applicable remedies, metrics specification and core requirements. Where security SLOs are highly important, the customer should request information/tools required for continuously monitoring security commitments. Particular attention should also be paid to the Information Security Incident Management component.

Greater importance should be attached to security SLOs by educating companies on cloud technology and particularly by increasing the ability to gauge and monitor security levels, filling major knowledge gaps in SMEs.

#### 4.2 Impact of SLA-Ready outputs on procurement and federation of cloud services

Over the coming 10-15 years, the vast amounts of data generated by scientific research domains will create enormous challenges for capturing, managing, and processing of this data. Cloud computing services for the science sector are clearly a key enabler for the establishment of this environment and, given the critical mass of data that science is called to manage, in-house resources of single research institutes are not sufficient anymore. European Education and Research institutes are eager to use and benefit from cloud services. Public e-infrastructures and commercial providers are being brought on board to tackle this new challenge.

However, the cloud brings a paradigm shift in distribution and usage models. This requires a new approach to connect the supply and demand sides and establish the right conditions of use.

Europe is well aware of this enormous challenge, and that is why the European Commission, in April this year, launched the European Open Science Cloud (EOSC) initiative<sup>2</sup>. The vision of the EOSC is to offer Europe's 1.7 million researchers and 70 million science and technology professionals a virtual environment with open and seamless services for storage, management, analysis, and re-use of research data across borders and scientific disciplines free at the point of use.

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<sup>2</sup> <https://ec.europa.eu/digital-single-market/en/news/communication-european-cloud-initiative-building-competitive-data-and-knowledge-economy-europe>

## The Helix Nebula Science Cloud

The goal of the Helix Nebula Science Cloud (HNSciCloud)<sup>3</sup> Pre-Commercial Procurement (PCP) is to establish a European hybrid cloud platform that will support the high-performance, data-intensive scientific use-cases of these ten procurers and of the research sector at large. The tender called for the design and implementation of innovative Infrastructure as a Service (IaaS) solutions for compute and storage, network connectivity, and Federated Identity Management and Service Payment Models.

Out of 28 proposals submitted during the summer, 4 consortia have been selected for the Design Phase of the HNSciCloud PCP:

- T-Systems, Huawei, Cyfronet, Divia
- IBM
- RHEA Group, T-Systems, exoscale, SixSq
- Indra, HPE, Advania, SixSq

SLA-Ready directly supported the design phase consortia. Firstly, SLA-Ready organized for Arthur's Legal and ICT Legal Consulting to provide direct feedback to HNSciCloud and the consortia. This initial assessment and analysis compared the proposed SLAs against the needs of the group of procurers led by CERN.

Arthur's Legal used the CRM for an initial analysis of the publicly available SLAs. This provided a basic framework for assessing the SLAs and this initial analysis helped CERN realise that more information from CSPs about the SLAs is required, notably in terms of data protection etc. Other priority elements of the CRM are associated with support, credits and changes as high priorities. All SLOs and metrics were also high priorities.

In turn, this encouraged the procurers and CSPs to complete the SLA self-assessment questionnaires. Responses were matched with recommendations from D3.3 in order to encourage the providers to make the content of their SLAs more transparent and easier to understand. This has been provided to HNSciCloud.

Bob Jones, CERN & Coordinator, HNSciCloud

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<sup>3</sup> [www.hnscicloud.eu](http://www.hnscicloud.eu).

### **GÉANT Catalogue of Services.**

Organisational, technical and financial structures used by Research and Education institutions do not easily integrate with the way service providers offer their services. For the 10.000 member institutions of the GÉANT community, to be able to 'get into the clouds' and start using online services, clarity and assurances of providers must be in place. Also, the GÉANT community needs to be able to 'get out of a cloud' when required or desired, and move to another provider or solution. Therefore avoiding vendor lock-in is essential.

GÉANT established a service delivery chain, to enable Research and Education institutes in Europe to adopt and use IaaS cloud solutions, in an easy, safe, predictable and controlled manner. GÉANT has put in place agreements with a range of suppliers of Infrastructure-as-a-Service (IaaS) solutions and connects these to the Research and Education IT ecosystem. Research and education institutions can use these agreements (consume from the selected suppliers) without any additional procurement being required<sup>4</sup>.

Transparent cloud SLAs make it easier to consume IaaS solutions in a manner compliant with European procurement legislation and with the right conditions of use.

The SLA-Ready CRM and outputs such as the CSP questionnaire and SLA-Aid can be used to address this issue in the future.

Andres Steijaert Surfnets & GÉANT

### **The European Grid Infrastructure**

The EGI Federated Cloud is an IaaS-type cloud, made of academic private clouds and virtualised resources and built around open standards. Its development is driven by requirements of the scientific community. At the beginning of 2016, the EGI Foundation established a new framework to mediate service level agreements (SLAs) between user communities and service providers of the federation. The main purpose of this was to create a reliable, trust-based communication channel between researchers and providers to agree on services and their levels and types of support. EGI are providing cloud services mainly to the research performing organizations and their business engagement program service SMEs are at the initial phase. EGI recognise the need to improve their SLAs for cloud services which currently are restricted to

The CRM can allow EGI to customize SLAs for cloud services to make them more suitable and aligned with other cloud providers' SLA. In this way they would follow a more standardised format. The CRM and other outputs such as the CSP questionnaire and SLA-

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<sup>4</sup> <https://ec.europa.eu/digital-single-market/en/news/results-geant-tender-infrastructure-service-solutions>.

Aid are very useful for us to source of information of what is expected by customers in terms of cloud SLAs. For example, the SLA Aid can also be used by EGI in Customer relationship process to better understand the needs of our customers.

From completion of the CSP questionnaire it is clear that most CRM elements are detailed. However, 7 elements identified as High Priority areas for cloud customers based on SLA-Aid responses are missing: Credits (CRM 17-19), unilateral change (CRM 12), update frequency (CRM 9); data management SLOs (CRM 27) and security SLOs (CRM 28).  
Malgorzata Krakowian, EGI

### 4.3 Impact on EC-funded initiatives

SLA-Ready has contributed to the EC clusters Data Protection, Security and Privacy (DPSP)<sup>5</sup>. The Cluster aims at increasing the impact of the integrating projects by identifying synergies and collaboration opportunities, exchanging knowledge and carrying out technical discussions to ensure the projects advance over the state of the art and provide value added solutions to the market. The Cluster gathers 25 EU-funded research projects that work on trust and security of cloud services<sup>6</sup>.

SLA-Ready contributed to the identification of challenges<sup>7</sup> to be addressed in the H2020 ICT Work Programme 2018-2020. SLA-Ready then delivered recommendations on these challenges, based on the developed CRM/good practices and related standardisation activities. More details are found in D3.3.

#### 4.3.1 SLA-Ready's contribution to MUSA impact

MUSA (MULTi-cloud Secure Applications) is a project that aims to help the design, deployment and run-time monitoring of multi-cloud applications taking into account security aspects. This process naturally entails the selection of the best suited set of possible deployments in the cloud platform. The process of cloud service selection and consequent creation (and updating) of multi-cloud application's Service Level Agreement (SLA) exploits the structured and validated data set pertaining to the security provisions of different cloud offerings, besides other details. The selection process in MUSA is supported by the Decision Support Tool (DST).

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<sup>5</sup> <https://eucloudclusters.wordpress.com/data-protection-security-and-privacy-in-the-cloud/>.

<sup>6</sup> APPHUB, A4CLOUD, CLARUS, CLIPS, CLOUDWATCH2, COCO CLOUD, CREDENTIAL, ESCUDO-CLOUD, MUSA, OPERANDO, PAASWORD, PRISMACLOUD, SECCORD, SERECA, SLALOM, SLA-READY, SPECS, STRATEGIC, SUNFISH, SWITCH, TREDISEC, TRESCCA, WITDOM.

<sup>7</sup> Please refer to

[http://www.cloudwatchhub.eu/sites/default/files/CloudWATCH2\\_Concertation%20Report%20Data%20Protection%2C%20Security%20and%20Privacy%20%28DPSP%29.pdf](http://www.cloudwatchhub.eu/sites/default/files/CloudWATCH2_Concertation%20Report%20Data%20Protection%2C%20Security%20and%20Privacy%20%28DPSP%29.pdf).

An important outcome of this project is a clear opportunity to obtain a structured, validated and up to date descriptive data of the service offerings of the CSPs. The SLA-Ready CRM includes some security and privacy control details that are very valuable for the selection process in MUSA.

*“The intersection of the scopes of the two projects makes it ideal to exchange the SLA-Ready Common Reference Model along with collected data about CSPs (SLA-Ready SLA Repository populated) that allows the toolset of MUSA to compare the security features of the different Cloud providers. Consequently, it also allows the SLA-Ready framework to obtain the validation of the data gathered and possible misrepresentations of the SLAs. The aim is to have a transparent, unprocessed dataset that can represent the state of the CSPs’ SLAs.”* Erkuden Rios, Tecnalía & Coordinator, MUSA

To facilitate such exchange, all the MUSA tools will be released as open source which would allow the SLA-Ready project to leverage the tools developed by the MUSA consortium.

It is therefore expected that the adoption of the SLA-Ready CRM together with the self-assessed data of SLA-Ready Repository will allow MUSA to have a feasible Decision Support Tool (DST) both at technical and legal levels, which will reinforce the project impact.

#### 4.3.2 Value of SLA-Ready for CloudWatchHUB

SLA-Ready has contributed to the CloudWatchHUB<sup>8</sup>, a pan-European cloud observatory with a suite of tools and services for SMEs. The SLA Marketplace is back linked from the CloudWatchHUB.eu and makes up an important part of the website section dedicated to tools and guides for SMEs<sup>9</sup>. CloudWatchHUB is able to expand its offer as part of its drive towards a sustainable service.

Table 2 outlines the mutual benefits of linking the SLA marketplace to the CloudWatchHUB.

**Table 2: SLA-Ready Tools & Services for the CloudWatchHUB.**

<b>SLA-Marketplace</b>	<b>Added Value for the CloudWatchHUB</b>
Use cases	Provides comprehensive set of use cases that can enhance SME and government sections.
SLA-Aid	Provides important tool to complement existing tools and guides for SMEs
SLA Repository	Helps prospective business cloud service customers to

<sup>8</sup> [www.cloudwatchhub.eu](http://www.cloudwatchhub.eu)

<sup>9</sup> <http://www.cloudwatchhub.eu/smes>

	identify cloud service providers that fit their specific needs.
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## 5 Exploitation Activities (2017 – 2018)

The project partners will address targeted joint exploitation plans for the next 24 months (2017-2018) that will feed through the entry point to the SLA-Ready Hub. The table below shows how partner expertise and future activities come together to compliment and reinforce the exploitation and sustainability plan and “SLA-Ready Support-as-a-Service”. More details on each activity are included in section 4.1.

**Trust-IT** will provide hosting and maintenance for the SLA-Ready Hub and SLA Marketplace for one year plus an additional year with ad hoc content introduced when relevant updates are necessary.

In joint exploitation activities with CSA, Trust-IT will continue to promote the SLA-Ready Marketplace to SME associations and National Trade Associations and consolidating relations with DIGITALEUROPE and the Digital SME Alliance. This will include support in promoting the marketplace to their members online and at workshops. As partner in the European Open Science Cloud project, Trust-IT will also continue to drive the adoption of the CRM and Marketplace tools in cloud procurement processes.

**CSA** will maintain (after the finalisation of the project) the SLA Repository in joint exploitation activities with Trust-IT and, and also support the continuous maintenance, of published SLA Repository entries by enforcing the “Term & Conditions” for CSPs as currently featured under the “CSA Star Registry<sup>10</sup>”. CSA will further explore the possibility of linking the CSA Star Registry to the Repository. CSA will also disseminate the online Cloud SLA-Aid.

**Arthur’s Legal** will provide access to its privileged and specialised legal services for contract support. This is addressed under the SLA-READY Services entitled: “Legal Services”. It will also disseminate the SLA Marketplace for SMEs.

**TUDA**, external exploitation addresses community building through publications and events advocating of the technical areas of SLA based trust metrics. This will also cover the development of academic-level tools for use by the broad community. These activities, based on the CRM methodology and SLA Readiness Index, will be actively sustained beyond the completion of the project where TUDA and Arthur’s Legal have already initiated joint exploitation activities. TUDA also provides an educational component for internal exploitation. Firstly, through the development of courses in Cloud trustworthiness, and secondly by developing students researching these areas. As this is a primary research area for TUD, the activities will be directly sustained post-project as courses and theses.

<sup>10</sup> Please refer to [https://cloudsecurityalliance.org/star/self-assessment/#\\_terms](https://cloudsecurityalliance.org/star/self-assessment/#_terms)



## 6 Partner exploitation & sustainability plans

### 6.1 Trust-IT Services

#### 6.1.1 Impact of SLA-Ready on Trust-IT

The following outcomes from SLA-Ready have impacted on Trust-IT:

**Promotion of SLA Marketplace:** This has furthered and increased Trust-IT's network of EU SMEs. This has also strengthened our relations with DIGITALEUROPE, Digital SME Alliance, NTAs and ICT clusters and new contacts such as EuroCIOs. Our development of the SLA-Aid and delivery of online versions of the SLA Repository and use cases has meant that we have been able to back up relations with quality output produced by SLA-Ready. This helps Trust-IT in promoting other such online tools and services in other EC-funded projects. The integration of the SLA Marketplace into the CloudWatchHUB.eu will enhance the CloudWatchHUB offer and make it more appealing to a wider audience, thus boosting its sustainability business model.

**Cloud SLAs at events:** Injected know-how of cloud SLAs into the Cloudscape series (Cloudscape 2016 and Cloudscape Brazil 2016) including delivery of presentations and position papers.

**CSP Questionnaire:** Opportunity to contribute to the HNSciCloud PCP procedure by providing feedback on providers' responses to CSP questionnaire based on D3.3.

#### 6.1.2 Trust-IT Assets and outputs

- Project management of Amendment process in H2020 project (WP1): Trust-IT has managed an amendment including the removal of a partner for the first time.
- **Practical implementation of the Common Reference Model (WP2):** Trust-IT has provided the sociological framework and analysis in relation to the state of the art. It has also extensively researched barriers to cloud service adoption by the business community. This is an important basis for creating tailor-made content and software tools for the SLA-Ready Marketplace.
- **Management of the Advisory Board (WP3):** Trust-IT has managed the Advisory Board and in particular revised its set up and expanded its scope beyond standards experts. By engaging with NTAs and ICT Clusters, Trust-IT has ensured that validation and feedback on project outputs has been expanded to this community as well as engaging with the HNSciCloud.
- **SLA-Ready Hub(WP4):** As one of the co-designers and co-content creators, Trust-IT has tailored project outputs such as the CRM and Business Guide (D3.3) into user-friendly content and online tools.
- **Delivery of exploitation plan:** Trust-IT designed and led the exploitation plan in Y2 and beyond the project lifetime. This included the organisation of 4 workshops and



increase of social media activities which has led to a growing community and contribution to project activities.

### 6.1.3 Trust-IT Exploitation & Sustainability Actions

#### **Maintenance of SLA-Ready Hub**

Trust-IT will maintain the SLA-Ready Hub for the next 24 months. This includes hosting, technical maintenance and ad-hoc updating of related content as a result of related activities.

#### **Promotion of SLA - Ready Hub & Marketplace**

Trust-IT will continue to promote the SLA marketplace and its assets to SME associations for potential adoption and as tools and services that could be included in potential “cloud SLA guide” sections that could be published on their own website with back links to the SLA Marketplace. Trust-IT is committed to follow up contacts made in Y2 beyond the project lifetime and to identify new organizations that could adopt the online tools and services.

#### **Cloud computing workshops to SME associations**

Through CloudWATCH2 activities, Trust-IT will continue to promote the CRM and associated outputs at stakeholder workshops provided to SME associations. The workshops are designed to educate SMEs on the business benefit of cloud adoption and how to deal with security and legal concerns. Cloud SLAs are one topic that can be covered through the outputs of SLA-Ready.

#### **SLA-Ready community**

Trust-IT will continue to engage with the social media community established. Members will be invited to related communities managed by related projects such as CloudWATCH2 where Trust-IT also leads dissemination activities. In this way the discussion forums on the topic of cloud SLAs will be continued beyond the lifetime of the project.

#### **Supporting cloud services for the scientific community**

Trust-IT will transfer good practices from the private sector to publicly funded research community. As partner in the European Open Science Cloud, Trust-IT will continue to sustain the use of SLA Ready outputs by this community and that they become part of the procurement process.

#### **Joint Exploration and Sustainability Activities**

As part of the SLA-Ready’s joint exploitation and sustainability plans, as partners in CloudWATCH2, Trust-IT and CSA will continue to promote the SLA-Ready Hub and SLA Marketplace, in particular the SLA-Aid and SLA Repository. This will take place through promotion on the CloudWatchHUB.eu and through the organization of cloud computing

workshops to SME associations. The SLA Repository will be updated with new entries by both Trust-IT and CSA. These activities will continue beyond the SLA-READY's lifetime to provide sustained advocacy of the CRM and the promote the SLA Marketplace to SMEs and CSPs.

## 6.2 Cloud Security Alliance

### 6.2.1 Impact of SLA-Ready on CSA

Three main outcomes from SLA-Ready are relevant for CSA:

- The SLA-Readiness index (and its possible integration to STAR), could allow CSA to provide additional information related to a provider's commitment to privacy and security, by integrating data related to the implementation of security and privacy controls, with information related to the relevant SLAs offered. Ultimately such integration would ensure information completeness and increase the level of assurance and transparency within the cloud ecosystems, compared to the service to the community that CSA is already providing through the STAR Registry. Furthermore, in the future the underlying SLA Repository's data could be exploited by the STARWatch tool.
- The STARWatch is "compliance and assurance as a service" tool that will be launched in February 2017 by CSA. The STARWatch will offer capabilities for organisations to perform and have access to security due diligence analysis of cloud service providers. The STARWatch tool interface will also drive the evolution of the CSA STAR Registry and will provide to cloud customers, providers, auditors and consultant a more user friendly interface and easier access to the information included in the STAR Repository, with the final objectives of facilitating cloud services selection, benchmarking and comparison as well as to enable match-making between demand and offer. The possible integration of SLA-related features and information has the potential to add additional value to the STARWatch tool since it will provide the possible assessment/evaluation of a service not only based on the generic implementation of a certain security and privacy capability, but also based on the level of service associated to that specific capability.
- The work being carried on standards is being exploited by CSA to position our organisation in the standardisation landscape related to Cloud SLAs. Some preliminary results are being already obtained e.g. NIST invitation to new initiative on machine-readable SLAs/control frameworks, and references to CSA work in ETSI CSC Phase II report and EC SMART (SLA Model) report.

The best practices and guidelines associated to the CRM, will be also contributed to CSA's community as part of related working groups like SLA, Cloud Trust and Cloud Trust Protocol.

### 6.2.2 CSA Assets and Outputs

- **Common Reference Model** (WP2): CSA is contributing to develop and validate the proposed CRM elements through the elicitation of real-world use cases (derived from CSA's background).
- **Engagement with standardisation bodies and related initiatives** (WP3): through its International Standardisation Council, CSA has become an active contributor to ISO/IEC on the topic of Cloud SLAs (19086 Parts 1-4). Besides, CSA is also monitoring the standardization/best practices landscape to identify other initiatives like ETSI CSC Phase II. Finally, CSA is also engaged with NIST in initiatives related to Cloud SLA metrics and machine-readable formats (to be launched Q1/2016).
- **Advisory Board** (WP3): CSA analyses the feedback received from the AB mainly to refine the WP3 approach to standardization (e.g., the suggested liaison with ISO/IEC SC38).
- **SLA Repository** (WP4): CSA is driving the creation of the SLA Repository both by proposing the SLA assessment criteria, and interacting with the CSP's that will validate the analysed SLAs (Q1/2017).
- **Marketplace** (WP4): in collaboration with Trust-IT, CSA is one of the main contributors to the overall design of the Marketplace. CSA is also contributing to the content related to standards and best practices.
- **SLA-Readiness index** (WP4): Along with TUDA and Arthur's Legal, partner CSA is designing the SLA-Readiness index so it can be validated into the context of the STAR repository.

### 6.2.3 CSA Exploitation & Sustainability Actions

#### On the dissemination side

Aligned to the exploitation plans presented in SLA-Ready's Description of Action (DoA), partner CSA has started five concrete actions to leverage the project's expected outcomes. These actions are summarised below.

CSA Open Certification Framework: Several and well-established security certification schemes exist to assess the level of security assurance in ICT systems. ISO27001, SSAE 16, ISAE 3402, SOC1-2-3, PCI-DSS are perhaps the most well-known. Although at the state of practice some of these are applied to cloud computing, it is widely acknowledged that none of them is sufficient to assess the security of cloud systems during their operational stage. A commonly used security assurance best practice from industry is the CSA CCM, which contains a comprehensive set of controls to assess the information security assurance level of CSPs. The CSA CCM is the technical standard used in the context of the CSA Cloud certification program, called Open Certification Framework (OCF) – STAR Program<sup>11</sup>. Currently the OCF-STAR Program is the most widely used and accepted cloud-

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<sup>11</sup> <https://cloudsecurityalliance.org/star/>.

relevant certification and attestation scheme, recently also used as a reference in an EC DG- DIGIT tender to procure cloud service for EU Institution (including the EU Parliament).

CSA is in the process of evaluating enhancing the information provided by OCF-STAR by leveraging two main elements from SLA-Ready namely (i) the SLA-Readiness index, and (ii) the SLA-Ready repository. Firstly, CSA will evaluate improving OCF-STAR Level 1 (self-assessment) and in particular the STAR registry<sup>12</sup> by adding qualitative information related to the compliance of CSP's SLAs to the designed Common Reference Model (CRM). Secondly, the data contained into the SLA-Ready repository (WP2/WP4) may be used to implement the envisioned "continuous audit" feature of the OCF-STAR Level 3. This continuous audit functionality will offer a structured approach for Cloud customers to query Cloud SLA-related information from the repository, most likely using a protocol like CSA CTP<sup>13</sup>. On a second implementation stage, CSA is also evaluating to leverage a comparison functionality based on the continuous audit information possibly based on the experience obtained from SLA-Ready.

Internal research groups: CSA maintains working groups across 29 domains of Cloud security<sup>14</sup>, a set of which are directly related to the core topic of SLA-Ready. In particular, we refer to the PLA WG, SLA WG, Cloud Trust WG, and Cloud Trust Protocol WG. As presented in Deliverable 4.2, CSA has started concrete actions to (i) support those WGs with the outcomes from SLA-Ready, and (ii) contribute to the WP2 CRM based on the best practices developed within those WGs. During Year 1 the most notable contribution from SLA-Ready was to the Cloud Trust WG<sup>15</sup>, where a catalogue of security and privacy SLA metrics was developed. Cross-fertilisation of these WGs is a continuous activity that CSA develops during the duration of the SLA-Ready project.

Another CSA initiative that has been benefited from the SLA-Ready outcomes is the International Standardization Council (CSA ISC<sup>16</sup>), which is positioning CSA in the field of Cloud SLA standardization within organizations like ISO/IEC and NIST.

#### On the economic side

CSA's best practices are available and free both to volunteers and corporate members. With respect to certification (OCF-STAR) the objective of CSA's 3-year business plan (2017-2020) is to achieve 400 certified CSPs in OCF – STAR (currently 220), from which it is expected to have at least 20% of them relying on Level 3 – continuous audit. Despite access to the STAR repository is free of cost, CSA is evaluating the economic/market value

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<sup>12</sup> [https://cloudsecurityalliance.org/star/#\\_registry](https://cloudsecurityalliance.org/star/#_registry).

<sup>13</sup> <https://cloudsecurityalliance.org/group/cloudtrust-protocol/>.

<sup>14</sup> <https://cloudsecurityalliance.org/research/>.

<sup>15</sup> <https://cloudsecurityalliance.org/group/cloudtrust/>.

<sup>16</sup> <https://cloudsecurityalliance.org/isc/>.

of advanced and automated features like CSP/SLA comparisons. Such functionalities may become part of the upcoming STAR Watch tool<sup>17</sup>.

### Joint Exploration and Sustainability Activities

As part of the SLA-Ready's joint exploitation and sustainability plans, as partners in CloudWATCH2, Trust-IT and CSA will continue to promote the SLA-Ready Hub and SLA Marketplace, in particular the SLA-Aid and SLA Repository. This will take place through promotion on the CloudWatchHUB.eu and through the organization of cloud computing workshops to SME associations. The SLA Repository will be updated with new entries by both Trust-IT and CSA. These activities will continue beyond the SLA-READY's lifetime to provide sustained advocacy of the CRM and the promote the SLA Marketplace to SMEs and CSPs.

## 6.3 TU Darmstadt

### 6.3.1 Impact of SLA-Ready on TU Darmstadt

Two main outcomes from SLA-Ready are relevant for TUDA as an academic partner:

1. The results obtained by TUDA during SLA-Ready, mainly the definition of the CRM and the creation of the SLA Readiness Index based on security assessment algorithms, has actively led to offering of new SLA-based trust quantification courses and seminars at TU Darmstadt.
2. Additionally, with the high thematic (educational and research) relevance of this area for TUDA, multiple ongoing BS/MS/PhD theses (by both regular students and industry students) are currently being executed/proposed on topics that have come up during, and related to, SLA-Ready. The topics of these theses span themes of (a) trust assurance based on SLAs (compliant with the CRM), (b) SLA-based trust validation for CSPs and Cloud Customers, (c) the monitoring of CSPs based on SLAs and (d) use of machine learning based high-performance algorithms for the comparative security and SLO dependencies evaluation across CSPs and their SLAs.

### 6.3.2 TU Darmstadt Assets & Outputs

- **Development of Common Reference Model (WP2):** As the primary developer of the CRM (and also the SLA Readiness Index) in WP2, TU Darmstadt plans to develop in-house tool offerings around the recommendation methodology based on the CRM and on the computation of the Readiness Index CSPs using the evaluation algorithms also based on the CRM.
- **Development of SLA Readiness Index (WP2):** TU Darmstadt, as the SLA Readiness Index creator, plans to add additional features to the aforementioned in-house

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<sup>17</sup> [https://cloudsecurityalliance.org/star/#\\_watch](https://cloudsecurityalliance.org/star/#_watch).

tools, such as also the compilation of customers' requirements (i.e., SMEs) using usable methods (i.e., natural language requirements) and the comparison of such requirements with individual CSPs' readiness indexes. This will be used to explore the search and discovery of the most convenient option for SMEs that wants to acquire Cloud services.

### 6.3.3 TU Darmstadt Exploitation & Sustainability Actions

As a university, TU Darmstadt's academic exploitation falls into the two main categories of external and internal exploitation.

The external exploitation primarily addresses community building in the form of publications, hosting and/or participating in thematic workshops, and organising seminars for advocacy of the technical areas of SLA based trust metrics. It also covers development of academic-level tools for use by the broad community. These activities, based on the CRM methodology and SLA Readiness Index, will be actively sustained beyond the completion of the project.

The internal exploitation comes from the educational component of (a) developing courses in the areas of Cloud trustworthiness, and (b) developing students researching these areas. As this is a primary research area for TUD, the activities will be directly sustained post-project as courses and theses.

**External Exploitation Activities:** For the external exploitation, TUD's DEEDS group has initiated multiple activities covering (a) research results in publications (e.g., Cloud Security Metrics related Trans. Cloud Computing, and joint publication on SLA Standards with NIST in IEEE Cloud Computing), (b) co-chairing professional workshops such as the Workshop on "Quantitative Aspects of Security Assurance (QASA 2015; QASA 2016)" ([www.iit.cnr.it/qasa2015](http://www.iit.cnr.it/qasa2015); 2016) that directly support exploitation related to trust metrics, and (c) presenting keynotes/seminars (e.g., NIST (SLA Based Cloud Security Metrics); Distinguished Seminars at: Duke University, University of North Carolina, NCSU (Security for Cloud Storage); Academia Sinica, Taiwan; SMU (Cloud Trustworthiness); Univ of British Columbia (Cloud Storage)).

Additionally, TUD conducted both academic and industrial seminars using three technology transfer mechanisms available at TUD, namely:

- a) The university-industry technology transfer CAST Forum for industry seminars e.g., Seminar on the 'Economics of Quantifying Cloud Trustworthiness',
- b) The TUD-CASED (Center for Advanced Security in Darmstadt) industry outreach programs, and
- c) TUD EC- SPRIDE (European Competence Center in Security & Privacy by Design) which has evolved into advocacy via the new TU Darmstadt Cyber Security Center CRISP.



TU Darmstadt's DEEDS group broader advocacy (and engagement) of the SLA based trust metrics area is ongoing with existing EC projects (e.g. FP7 SPECS, H2020 ESCUDO-CLOUD, A4Cloud), via engagement with focused working groups such as EC's C-SIG-SLA WG, and also with standards bodies such as ENISA/NIST/CSA (e.g. CSA EMEA Workshop on Governance Accountability Compliance <https://csacongress.org/event/emea-2015/#worksops>). TU Darmstadt has also successfully engaged with NIST for SLA standards that resulted in a joint TUD/CSA/NIST publication entitled "Leveraging the Potential of Cloud Security Service Level Agreements through Standards" in IEEE Cloud Computing. A related research agenda influencing activity was a panel discussion on Trust Metrics at BMBF (German Federal Ministry for Science and Technology). TU Darmstadt is also utilizing its membership in the European Computer Science Summit (ECSS) to advocate SLA reference models.

The TUDA DEEDS group plan to pursue the advocacy of the Cyber trust quantification area via dedicated EC fora such as Marie Curie ITN's has been successful with the acceptance of H2020 ITN-MC-NECS. This training network will not only directly sustain SLA-READY's broader impact to the current industry and academic members, but also actively grow its community exposure as the training network (as per its charter) expands in both scope and membership.

**Internal Exploitation Activities:** For the internal exploitation, the DEEDS group has initiated multiple BS/MS course/seminar offerings in the area of Cloud Trustworthiness. This is also a technical growth area for the university, and our approach is to expose the students to the multiple research and educational offerings to grow their research/technical competencies for both research and applications. As a first step we have offered a MS level seminar on "Security and the Cloud—the Issues and Metrics" and will develop (and continue developing) SLA relevant content in this and additional seminar/course offerings. Related to the latter, the DEEDS group will leverage the data contained into the SLA-Repository and the SLA-Readiness Index to provide empirical validation of the developed SLA metrics models and techniques. The specific topics related to trust metrics will continue to be advertised for MS and PhD theses. The DEEDS website <https://www.deeds.informatik.tu-darmstadt.de/deeds/> continually lists these offerings.

#### **Joint Exploration and Sustainability Activities**

As part of the SLA-Ready's joint exploitation and sustainability plans, TUDA and Arthur's Legal have already initiated long-term collaborative activities to cover tools development, SLA usage processes, and SLA-based trust quantification among others. These activities will continue beyond the SLA-READY's lifetime to provide sustained advocacy of the approaches behind the CRM and the SLA-Readiness Index to the broad applications community spanning SMEs, CSPs, and policymakers.

## 6.4 Arthur's Legal

### 6.4.1 Impact of SLA-Ready & Arthur's Legal

**CSP & CSC Maturity:** The joint efforts of the consortium partners in SLA-Ready has allowed Arthur's Legal to further validate its Document IU and CRM methodology it had already developed before the start of the project, and disseminate those in a bundled way, not only to larger organisations, both in the public and private sector, but also in the early-stage and other SME market where Arthur's Legal has been active since its incorporation in 2001. With SLA-Ready, it has also been incentivised to spend effort, expert involvement and financial resources outside the scope and budget of SLA-Ready to come to even more advanced geo-located, market-segmented, customised and weighted maturity level methodologies to both assess and help CSPs and CSCs. We will also continue to provide to offer cloud SLA-based and related workshops seminars within the European Union and beyond.

**Additional presentations, panels and other prominent face-time to discuss and disseminate the CRM:** Where Arthur's Legal already is presenting and discussing technological opportunities, digital transformation, convergence, new risks and legal challenges worldwide, SLA-Ready has positively added to being able to disseminate the vision, mission and initiatives of the European Commission in general, and DG CONNECT in particular, not only towards start-ups, other early-stage companies and SMEs, but also to organisations, both in the private and public sector, that face the same challenges and have the same question as SMEs. We will certainly continue to do this after the formal end of the SLA-Ready term. There is still a lot of work to do to help the digital markets mature, both on the CSC side, SMEs and other organisations, and the CSP side.

**EU's Science Cloud:** Arthur's Legal had the opportunity to contribute to the HNSciCloud PCP procedure by providing some assessment on certain related CSPs and feedback to HNSciCloud. Arthur's Legal has done this activity as pro bono for HNSciCloud, outside the scope and budget of SLA-Ready, in order to provide with HNSciCloud with legal support and confidential assessment of specific CSPs. This, as such specific assessments are not part of SLA Ready, also as per legal purposes (warranty, liability and the like). Still, this exercise triggered certain CSPs engaging with HNSciCloud to use the SLA Ready Aid / Questionnaire, and have given themselves more insights in their own maturity level as well.

### 6.4.2 Arthur's Legal Assets & Outputs

**Common Reference Model (WP2):** As the primary developer of the CRM (and also the SLA Readiness Index) in WP2 together with TU Darmstadt, Arthur's Legal plans to develop both co-creating and in-house tool offerings based on the CRM and the like. As mentioned above, Arthur's Legal will further develop even more advanced geo-located,



market-segmented, customized and weighted maturity level tools and services to both assess and help both the CSP and CSC side. SMEs are not only on the CSC side, but especially those that are procuring cloud service to become CSP themselves to help renew, redesign and structure their business on top of such cloud services (IaaS or PaaS) is one of the main factors and ways for SMEs in the European Union to leverage on the benefits of cloud computing and related capabilities, possibilities and opportunities.

#### 6.4.3 Arthur's Legal Exploitation & Sustainability Actions

**Cloud Comfort Zone:** Arthur's Legal is and remains active in facilitating, assisting and providing organisations with deep knowledge, execution power and comfort to leverage on the opportunities of cloud computing, internet of things, data analytics, artificial intelligence, robotic process automation and the like. For 2017 and beyond, it has planned to facilitate and empower both the parliament (on a non-political level), central government, relevant governmental departments and municipalities on those opportunities, and where and how they can support and collaborate with SMEs and other organisations in the private sector. Both for the benefit of a respective member state, as well for knowledge export purposes. In the Netherlands, some of these public private initiatives are called 'partners in international business' ('PiB'), and Arthur's Legal will use the deliverables out of SLA-Ready to add to those PiBs, as well as to the national strategy on digital economy and society, including without limitation in the data protection, cybersecurity and cloud procurement horizontal markets as well as in vertical markets such as ecommerce, smart cities, startup hubs and the like. These activities are not restricted to the Netherlands only; Arthur's Legal is in contact regarding these plans with several other member states as well for instance.

**Specific Exploitation:** Arthur's Legal is consortium partner in the H2020 project CREATE IoT, which will start on 1 January 2017, and in which the CRM and related outputs will be used and deployed in the vast domain that hyperconnects physical with cloud, cloud edge, cyber and virtual: internet of things (IoT) ecosystems.

**General Exploitation:** Arthur's Legal will also directly leverage SLA-Ready outputs to offer specialised services to its clients. SLA-Ready will therefore enable Arthur's Legal to extend its portfolio of client services and become more flexible and relevant to SMEs and micro companies as a growing market segment. Specifically, it will exploit the reports documenting the best practices for managing cloud SLA: systematic and multi-level comparison, metrics for validation; techniques for the negotiation and trade-off evaluation; enforcement of SLA conditions; contract termination procedure; guidance on (cost-aware) monitoring of cloud SLA execution. Specific offerings will be made available through Arthur's Legal website ([arthurslegal.com](http://arthurslegal.com)) as well as various omnichannels, labels and joint-ventures.

## Joint Exploration and Sustainability Activities

As part of the SLA-Ready's joint exploitation and sustainability plans, TUDA and Arthur's Legal have already initiated long-term collaborative activities to cover tools development, SLA usage processes, and SLA-based trust quantification among others. These activities will continue beyond the SLA-READY's lifetime to provide sustained advocacy of the approaches behind the CRM and the SLA-Readiness Index to the broad applications community spanning SMEs, CSPs, and policymakers.

## 7 Conclusions

In the era of digitalisation and in a hyper-connected global economy, cloud computing is an enabler in many industry sectors, from retail and smart manufacturing to smart agriculture. Cloud gives life-breathing properties to the many companies with no IT administrator in-house or skills to set up and manage servers and software, allowing them to scale up as their business grows. For medium-sized firms migration of new applications to the cloud can benefit from rapid upgrade cycles and low capital costs.

Despite phenomenal growth in recent years, cloud trends are much more nuanced than some providers and market data would have us believe. Looking at adoption from a user perspective paints a different picture. According to recent research from IDC, on-premises are still dominating while our findings reveal that many SMEs are still at a very early stage in assessing the benefits of moving to the cloud. SMEs in Spain are a good case in point.

SLA-Ready has addressed this with its dedicated tools and services:

**The SLA Common Reference Model & SLA Readiness Index:** We have demonstrated the value of a Common Reference Model (CRM) promoting a common understanding of SLAs and their attributes, encouraging the implementation of best practices within the industry and helping customers and resellers understand the crucial elements of a Cloud SLA, including minimum compliance levels and how to manage the complete service lifecycle.

**SLA Ready Hub and SLA Marketplace:** A major barrier to the adoption of cloud computing by SMEs is knowledge. We have demonstrated the tangible benefits of using the SLA Aid and the SLA Repository. Adopting cloud services should not be viewed as a “no-brainer” but rather as an informed decision having scrutinised the contractual terms and SLAs, and making comparisons with other service offers. as

**SME Workshop series:** Our findings show that SMEs and the increasing number of resellers lack expertise in two key areas: the ability to assess a provider's security measures and understanding of the legal implications, including compliance with forthcoming EU regulations. We have identified a real need for practical hands-on workshops with an essential legal guide complemented by the SLA-Ready Hub and SLA Marketplace so SMEs know what to expect, what to do and what to trust when choosing a cloud service

**SLA Standardisation:** The emphasis on relevant standards for Cloud SLAs in the Common Reference Model contributes to standardisation as a cornerstone of the Digital Single Market by supporting a more transparent, efficient and effective EU standardisation system. SLA-Ready active participation in the development of standards through CSA liaison is also an important contribution to the EC's objective on finalising international standards on SLAs by mid-2017 to ensure transparency and quality of end-users, especially SMEs, an important input considering that SLA-Ready as conceived before the DSM strategy was established.

Finally, this document defines the plans for exploiting and sustaining the outputs of SLA-Ready according to the specific expertise of each partner, strengthened through complementarities to meet the real market needs identified.

## Annex 1 - Document Log

DOCUMENT ITERATIONS		
V1.0	ToC and initial contributions	Nicholas Ferguson, Trust-IT & Jesus Luna, CSA
V2.0	First version including partner sustainability plans	Silvana Muscella, Nicholas Ferguson, Trust-IT; Neeeraj Suri, TUDA; Daniele Catteddu, CSA; Arthur van der Wees, Arthur's Legal
V3.0	Project impact sections added	Stephanie Parker, Trust-IT
V4.0	Further general edits	Nicholas Ferguson, Stephanie Parker & Roberto Cascella, Trust-IT
V5.0	Internal review	Neeeraj Suri, TUDA; Arthur van der Wees, Arthur's Legal
V6.0	Final version	Nicholas Ferguson, Trust-IT