



## D11.19: Report on Dissemination, Exploitation, and List of Technical Outcomes (13)

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## 1. Executive Summary

This document is a copy of the report on dissemination, exploitation and list of technical outcomes, in the form of a news bulletin.

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## 2. Document Information

### Contributors

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### History

Version	Date	Author	Changes
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## 4. Project Reference

A report on dissemination, exploitation and list of technical outcomes.

These deliverables are a series of bulletins describing relevant current dissemination outcomes and technical updates thus promoting internal communications.

The reports will be circulated as newsletters.

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## 5. LIGHTest Bulletin (13)



**Newsletter**  
Edition 13  
November 2019

This Project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No. 700321 

### Q&A with Heiko Rossnagel, Fraunhofer



**As we get near the end of LIGHTest, how do you feel the project has gone? What have been the project highlights?**

LIGHTest has gone incredibly smoothly as a project and I have worked on a lot of EU projects in the past! The team are all very motivated and there has been excellent collaboration right from the start.

We did face a challenge when IBM exited the project but adding a new competent partner in their place ensured we could extend the project by three months and successfully move forward.

There have been many highlights in the project, I really like the model we have created for trust schemes that was finished in WP3 and I think that this unified model is extremely helpful in discussing differences in trust schemes, something that was missing before and it is a major contribution by LIGHTest. There was a lot of interest in the community and also at the UN Trade and Commerce expert group on trust schemes and they intend on basing some of their findings on this model.

The pilots have been fascinating and allow us to create a lighthouse where we can demonstrate how LIGHTest works. A big highlight for me is seeing the reception we get everywhere we present; there is a need for LIGHTest and people are excited about what we have done.

We've already put LIGHTest into different projects, for example collaborated with Industrial Data Space in Germany.

The development of the Automated Trust Verifier is essential for the project. The mobile aspect in WP7 has also been a highlight of the project.

**The pilots have worked on real use cases, how do you feel their successes have contributed towards the project goals?**

As these are not finished yet it is a bit hard to comment. The purpose is to show that the technology we have developed works in the real world. They are designed on real use cases and they show what contribution LIGHTest could have and the benefits arising.

**Now the project is nearing the end, what will be the next steps to encourage ongoing success?**

We have provided a very useful infrastructure and I think having showcased that this infrastructure works and it has been implemented in real use cases, helps to create visibility. The ideal outcome would be that the European Commission picks it up and they publish their own trust lists using LIGHTest. I also hope that we can convince other governments and other entities to use the LIGHTest infrastructure. I think we have achieved a lot in this regard as we have already been in talks with Azerbaijan and we have a Turkish partner who we have

involved on a Turkish trust scheme. I am therefore hoping short term that we might be able to get other entities to adopt the technology.

The great thing about LIGHTest is that if you want to use LIGHTest you do not need much at all. The effort required to use the LIGHTest infrastructure is simply to set up a DNS server and then you are ready to publish the information. All the tools are available via open source and the implementation is minimal, it is around the way the data is defined. The ATV can be used as an online service so you do not have to worry about difficult installations and can rely on existing internet services.

Internally we will be discussing how as a consortium we can exploit LIGHTest. As LIGHTest is now available we can start to think differently about problems and use LIGHTest as a trust anchor for other schemes. LIGHTest could be big in the area of decentralized identity management which is using blockchain. LIGHTest solves a major problem that many do not realize exists. The problem is that in decentralized identity management, the credibility of the identity issuer is often not checkable, not confirmed and not

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Produced by EEMA - WP11 Lead, LIGHTest

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proved trustworthy; LIGHTest could fix that problem.

**What does success of LIGHTest long term mean to you?**

Long-term success would mean that the technology is still used in a couple of years' time. It would be great if the lessons we have learnt in LIGHTest could be applied in other projects, use cases and technologies. I believe this is something we have already achieved as LIGHTest has been adopted and the use cases are way beyond what we originally planned. This is a great building block for future advances in this space and if this continues, this building block will lead to long term success.

**What factors do you believe to be important to encourage organisations to look to using LIGHTest in the future?**

Similar to every new technology, it needs to provide its perceived benefit. I believe one of the most important qualities is that it is easy to use. With LIGHTest it is not hard to use and you can set it up in a few hours and it is ready to go.

**What plans are in place to build on the work that has already taken place after the project ends?**

We are still working with UNHCR and will have a demo at the end of the project that will showcase this use case in more detail. If this goes well then there is a potential to continue in that direction.

**Advisory Board perspective - Mike Garcia**



The Internet has provided efficiency and productivity across many facets of society. It has shown a power to connect with others,

transform industries, and streamline processes. In the world of digital identities, however, it has had limited success in fulfilling this promise. For as long as human societies have existed, we have used trusted third parties to vouch for others—even for high sensitivity and high consequence transactions. We have struggled to efficiently replicate this on the internet, at least without trading off for higher levels of fraud. Solutions have popped up over the years to address this, but LIGHTest promises to finally change this at Internet scale.

The LIGHTest project has developed the foundation for leveraging third parties to make—and extend—trust decisions much more efficiently than has been possible before. As this great foundation matures, policies by which an organisation verifies an individual will be increasingly standardised, allowing other organisations to assess and make their own trust decisions automatically. This can remove the burden of repeatedly proofing and verifying individuals, often still conducted manually, while at the same time increasing the consistency of outcomes. It can lead to faster service times, fewer errors, and increased mobility for individuals. These are benefits for everyday tasks and backend business operations, but can extend to addressing gaps in digital adoption and humanitarian efforts. And these are benefits from the applications we know about.

As the initial development period for LIGHTest project closes, it's time for other organisations to step up and mature the functioning codebase, adding value in the interest of their own business activities. Whether community contributions or for commercial purposes, the best next step for LIGHTest is involvement of those that can drive LIGHTest toward adoption and production uses. Innovation comes from creative application of tools, and LIGHTest is a tool ripe for creative application.

**Advisory Board perspective - Tim Reiniger**



"I believe that LIGHTest will be recognized as a great gift of the EU to better the lives of people all over the globe."

It has been a great honour for me to have been involved with a project of such great purpose and involving so many people of the highest calibre. As the LIGHTest project comes to a formal close, I believe that this is just the beginning. As the range of its uses become realized, I believe that LIGHTest will be recognised as a great gift of the EU to better the lives of people all over the globe.

In visiting the various statues and memorials to Schiller in Stuttgart, De Las Casas in Seville, Maximilian Kolbe in Graz, Sibelius in Helsinki and Kierkegaard in Copenhagen, I have come to see that LIGHTest can take a part in this long tradition of centering on the human being and freedom. In our time, the challenge for digital identity is to maintain a focus on the human in the face of technology and

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centralized systems. By enabling chained and distributed trust globally, LIGHTest is well-poised to assist humans who are forced to migrate due to climate change, political violence, and lack of economic opportunity.

The next task for the EU and the LIGHTest community is to navigate the various political, economic, and social structures to achieve the widest possible global deployment of LIGHTest. And, this is an urgently needed effort that must persist.

## Reflections from Work Package leads

**Sebastian Moedersheim, DTU Requirements, Concepts and Evaluation (WP2)**

WP2 is the formal basis and framework of the LIGHTest project.

The work package defines the trust policy language and with that the precise unambiguous semantics of the policies that LIGHTest is dealing with, and a highlight was the close integration of logic and executability through a Prolog-like setup. A related highlight is that we were able to connect this to a first-order logic theorem prover so that we can have an independent verification of the trust decisions made by the

Automated Trust Verifier (ATV) of LIGHTest, giving us a very high level of accountability. Another highlight is that this development inspired a graphical expert-level language that we did not envision in the beginning of the project - it just naturally arose from the theoretical work on the trust policy language.

WP2 also defined the architecture for the project and thereby the entire framework of the project and this was an invaluable reference and guidance throughout the project.

Last but not least, it was the major task of WP2 to define the requirements for functionality, security, accountability, privacy and legal aspects for the project and to evaluate the architecture, the implementation, and the pilots with respect to these requirements. While we have seen that some requirements were a bit too strong, overall this was also a success and helped us also to avoid many pitfalls during the course of the project.

**Javier Presa Cordero, Atos Infrastructure for Translations across Trust Domains (WP4)**

WP4 is intended to provide the infrastructure for the publication and querying of Trust Translation Schemes, and in this regard, it has been designed as a conceptual framework for the translation of the Levels of Trust Schemes. Trust Translation Authority concept (TTA) has been developed,

including a functional architecture that provides a common representation for all the types of Trust Schemes identified in WP3 (Boolean, Ordinal and Tuple based) and allows the management of equivalence or translations among Trust Schemes and their levels in a common and simplistic way independently of the types. The publication and the discovery approach are DNS-based, using the existing DNS systems and resource records.

During the design and development phase we had the opportunity to explore the trust services domain, discovering new ways of bringing the Trust Schemes to the end-users. We provided a non-existing mechanism to translate the different levels of one Trust Scheme to another, digitalizing, in a manner of speaking, the bilateral agreements between different companies and countries. What we created is a very useful building block for any further step on this trust services domain.

**Olamide Omolola, TU Graz Trust Policy and Automatic Trust Decisions (WP6)**

The concepts of LIGHTest provide a solid basis for automated transactions across various domains and cross border in an increasingly digital heterogeneous world. This work package involved the development of the Automated Trust Verifier as well as the Trust Policy Authoring Tool.

The first highlight of this work package is the Automated Trust Verifier (ATV). The ATV is the central concept in LIGHTest. It derives input from the other components in LIGHTest i.e., Trust Scheme Publication Authority (TSPA), Trust Translation Authority (TTA) and Delegation Publisher (DP). The ATV verifies the trustworthiness of incoming transactions based on the interpretation of the TPL trust policy, as well as input from the TTA, DP and TSPA.

The second highlight of this work package is the Trust Policy Authoring Tool (TPAT). The TPAT is used to create and edit trust policies. Trust policies are written in an extensible Prolog subset, which allows formulating sophisticated trust questions. The TPAT has provisions for the less proficient user with a graphical layer. The intermediate user has access to a natural language layer while proficient users can use the TPL layer which is similar to IDEs. This layering model allows domain experts with little technical knowledge to formulate a policy specific to their domain.

**Dr. Frank-Michael Kamm, G+D Mobile Security Trust Propagation of Derived Mobile IDs (WP7)**

A demo application is now available, showing ID derivation and the link between ID and FIDO credentials. Also, an integration with IDnow as ID provider has been completed

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demonstrate how the LIGHTest mobile ID scheme can be integrated into existing commercial schemes and solutions. Integration of LIGHTest API to request LoA of mobile ID has been completed. A FIDO-based mobile ID scheme with known LoA, facilitating LIGHTest infrastructure has been developed and demonstrated successfully.

**Alberto Miranda Garcia, Atos Transfer to Market (WP10)**

LIGHTest develops a lightweight trust infrastructure providing parties of electronic transactions with automatic validation of trust based on their individual trust policies. To ease integration and improve availability on any system, LIGHTest makes use of the existing global Domain Name System (DNS) for publication, querying, and cross-jurisdiction translation of information relevant to make such decisions, including levels of assurance.

At this stage the consortium approach to the project exploitation has made a specific emphasis in its Open Source vocation to the distribution of the project results. These results have derived to an enhancement of the DNS infrastructure which benefits can be universally used under the characteristics of the open source license.

Nevertheless, the project still acknowledges two lines of action: one line towards the commercial use of

results, based on a IDaaS (Identity as a Service) approach and another towards the use of knowledge gained within the project.

Some of the action lines envisaged to extend the project sustainability are, among others:

1. Direct use of LIGHTest Components (ATV, TSPA, TTA)
2. Change of a Route Certificate
3. Trust and Identities in Humanitarian Sector
4. Access Control for IoT Sensors etc.
5. Supply Chain and Value Chain Trust Management

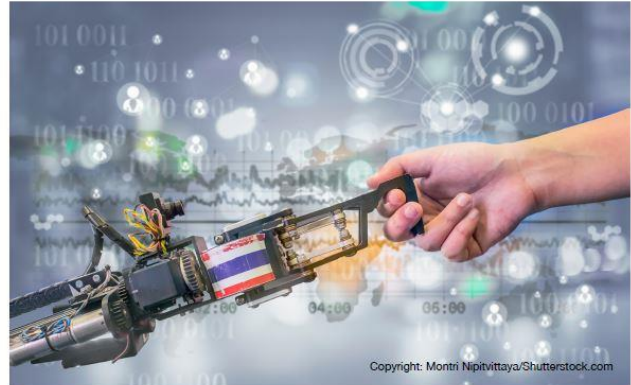
## Beyond LIGHTest



**Jon Shamah, Chair of EEMA (WP11)**

LIGHTest allows you to use a global, known and trusted infrastructure to: retrieve declared policy and certification details from partners; verify those declared policies and certifications from Trust Lists; determine trust assurances behind partners, and so facilitate your own decision making.

As such LIGHTest does not provide an alternative to eIDs, business registers or certifications, neither does it allow you to outsource trust decisions.



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LIGHTest is intentionally flexible and addresses an increasing need to establish ad hoc trusted relationships between counterparties.

So to what uses could LIGHTest be applied in the future, meeting the varying needs of differing relationships?

LIGHTest has already been incorporated into its initial use-cases. In particular, this is in the context of certification-based policies such as Public Key Infrastructure. An additional use-case that has been examined is in the context of higher education and the trust in qualifications and educational standards.

However, arguably the largest potential

market is for compliance with contract-based policies.

For example, in a business-to-business relationship, the counterparties may have particular requirements regarding child-labour, or health-and-safety procedures. These requirements may not have any associated formal certifications. So how can these be as easily incorporated into LIGHTest as the certified policies, as without a Trusted Third Party it cannot be checked with formal authority?

This problem has already been addressed in many industries, especially in the business-to-consumer world like applying online for car insurance. Here the consumer has to declare many details of driving

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and claim history which are not easily verifiable. The fundamental is that these declarations, and any subsequent issuance of a car insurance policy are governed by contract law, rather than legislation. The outcome is that in the event of a false declaration, a subsequent claim will be void, and the contract will be null. In this case some of the declarations are verified by trusted third parties, like credit rating agencies, and others by government agencies, but the more complex, subjective (such as health) or expensive to verify declarations are not verified.

In the case of LIGHTest, a counterparty may appoint a trusted third party, such as a provider of accredited management systems certification to provide the required assurance and certification.

This contractual relationship works well in business-to-business transactions. For Industry 4.0, we need integrity and transparency above and beyond business searches, for software driven supply chains and ad hoc suppliers and customers. Dynamic factors to consider with the partners are: Quality Mandates; Safety; Ethics; Environmental; Documentation / Compliance; Security (Cyber and Physical); Resilience; Access Control; and Authorisation.

Below (Figure 3) is an example of a set of possible requirements for a fictitious business to business relationship:

Quality Mandate - certification of services	Y/N
Safety - do staff health conditions comply to...?	Y/N
Ethics - is there a business ethics policy?	Y/N
Environment - is there a carbon reduction strategy?	Y/N
Compliance – does the company comply to ISO.....?	Y/N
Security (Cyber / Physical) - is there a dedicated CSO?	Y/N
Resilience – is there a resilience strategy implemented?	Y/N
> Off-site data backup?	Y/N
Access Control	
> Biometrics (fingerprint) ?	Y/N
> Offboarding Process?	Y/N
Authorisation / Delegation Policies	
> Purchasing Manager Grade C < €50,000	Y/N

In this particular case, there are a number of issues that may be self-certified. In those cases, using LIGHTest, these can become part of each and every transaction, and if they are later found to be false, and there is a loss that has been suffered, there may be a strong case for legal action and compensation as the declaration was made at the moment of transaction. Of course, certification by an accredited body is preferable, and the use of such a body will be an economic decision.



LIGHTest, in the medium term, and with some development might be seen as a declaration mechanism in the business-to-business contractual environment, which can extend across many different issues and which may be certified by an appointee of choice or even self-certified.

LIGHTest, in the longer term could even be considered as an interlocuter between two artificial entities, who

are interacting. Consider this in bank trading platforms where automated trading might take place in a more ad hoc market, where declarations (such as liquidity attested by a central bank) could be used in a vast global open bourse.

LIGHTest is flexible and extensible, and has a potential only limited by imagination.

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## General Meeting in Stuttgart, Germany



The final GA meeting took place in Stuttgart, during which the LIGHTest consortium continued to finalise the details of this important project. The meeting ensures that the project is concluded in a manner that encourages sustainability, and there were many conversations about how LIGHTest will continue towards new uses and opportunities.



## The LIGHTest Project Partners



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## 6. Project Description

### **LIGHT<sup>est</sup> project to build a global trust infrastructure that enables electronic transactions in a wide variety of applications**

An ever-increasing number of transactions are conducted virtually over the Internet. How can you be sure that the person making the transaction is who they say they are? The EU-funded project LIGHT<sup>est</sup> addresses this issue by creating a global trust infrastructure. It will provide a solution that allows one to distinguish legitimate identities from frauds. This is key in being able to bring an efficiency of electronic transactions to a wide application field ranging from simple verification of electronic signatures, over eProcurement, eJustice, eHealth, and law enforcement, up to the verification of trust in sensors and devices in the Internet of Things.

Traditionally, we often knew our business partners personally, which meant that impersonation and fraud were uncommon. Whether regarding the single European market place or on a Global scale, there is an increasing amount of electronic transactions that are becoming a part of peoples everyday lives, where decisions on establishing who is on the other end of the transaction is important. Clearly, it is necessary to have assistance from authorities to certify trustworthy electronic identities. This has already been done. For example, the EC and Member States have legally binding electronic signatures. But how can we query such authorities in a secure manner? With the current lack of a worldwide standard for publishing and querying trust information, this would be a prohibitively complex leading to verifiers having to deal with a high number of formats and protocols.

The EU-funded LIGHT<sup>est</sup> project attempts to solve this problem by building a global trust infrastructure where arbitrary authorities can publish their trust information. Setting up a global infrastructure is an ambitious objective; however, given the already existing infrastructure, organization, governance and security standards of the Internet Domain Name System, it is with confidence that this is possible. The EC and Member States can use this to publish lists of qualified trust services, as business registrars and authorities can in health, law enforcement and justice. In the private sector, this can be used to establish trust in inter-banking, international trade, shipping, business reputation and credit rating. Companies, administrations, and citizens can then use LIGHT<sup>est</sup> open source software to easily query this trust information to verify trust in simple signed documents or multi-faceted complex transactions.

The 39-month LIGHT<sup>est</sup> project started on September 1st 2016 and has an estimated cost of almost 9 Million Euros. It is partially funded by the European Union's Horizon 2020 research and innovation programme under G.A. No. 700321. The LIGHT<sup>est</sup> consortium consists of 14 partners from 9 European countries and is coordinated by Fraunhofer-Gesellschaft. To reach out beyond Europe, LIGHT<sup>est</sup> attempts to build up a global community based on international standards and open source software.

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The partners are ATOS (ES), Time Lex (BE), Technische Universität Graz (AU), EEMA (BE), G+D (DE), Danmarks tekniske Universitet (DK), TUBITAK (TR), Universität Stuttgart (DE), Open Identity Exchange (GB), NLNet Labs (NL), CORREOS (ES), and UbiSecure (FI), and University of Piraeus Research Center – UPRC (GR).

The Fraunhofer IAO provides the vision and architecture for the project and is responsible for both, its management and the technical coordination.

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