Ref. Ares(2017)2745 - 02/01/2017

TagItSmart!: Smart Tags driven service platform for enabling ecosystems of connected objects

Grant agreement 688061

Report on ecosystem bootstrapping activities

Deliverable ID:	D6.3
Deliverable Title:	Report on ecosystem bootstrapping activities
Revision:	1.0
Dissemination level:	Public
Responsible beneficiary:	RD
Contractual date of delivery:	31/12/2016
Actual date of delivery:	31/12/2016
Start date of the Project	01/01/2016
Duration of the Project	3 years
Approval:	Srdjan Krco

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Introduction

D6.3 selects the most relevant stakeholders in the ecosystem based on *desk research*, *interviews with the project partners*, *relevant dissemination at conferences* and *stakeholder meetings*. This leads to the planned *outcomes* and KPI's for a roadmap for Y2 and 3.

TagItSmart plans to leverage the existing ecosystems and communities by practically embedding SmartTags and TagItSmart! enablers into other systems, providing hooks between TagItSmart! framework and selected number of existing ecosystems and communities and thus creating a sort of overlaid ecosystem capable of efficiently using TagItSmart! outputs for creation of sustainable business and services for a range of entities. With the TagItSmart framework it is possible to create both the SmartTag-scanner and the TagItSmart compatible platform. A SmartTag-scanner is a device capable of decoding information that is encoded into SmartTAG. Together, SmartTAG and the SmartTag scanners collect information about product and current user/product context, when this information is combined with TagItSmart compatible platform even more relevant information will be accessible to user. TagItSmart should be prepared to support billions of printed SmartTAGs per day/company/SKU item.

The challenge is to look beyond solutions for any single sector (manufacturers, retailers or recyclers) and to think about the entire value chain. For instance, in the study *Growth Within: A Circular Economy Vision for a Competitive Europe*[1], one key recommendation for Europe is to develop a **"**material backbone" – a system to optimize the circulation of materials[2] and minimise the need for virgin resources – to strengthen its competitiveness. How can TagItSmart play a role in achieving such a systemic goal? TagItSmart introduced the *Circular Economy* in *The first SmartCitiesWorld Advisory Board breakfast* meeting n the £30million retrofitted IET (Institute of Engineering & Technology) Savoy Place in central London with attendees from Arup, Cisco, John Lewis, Accenture UK&I, Strategic Energy & Infrastructure Project, UK Government, Telefonica, Samsung, The Institution of Engineering and Technology, RTPI (Royal Town Planners Institute).

We want to test our developed infrastructure and framework in pilots, ensure it is robust in-life, together with options for consumer / user engagement, all with currently available technology (eg barcodes) and develop these elements in parallel to the development of the functional ink tags. For that we need to involve: third party businesses to confirm/comment our findings and implementations and focus on the balance of gaining intelligence from the tag and from the actual involvement and engagement of end users, as well as the environment envisioned in the scenario (home, supermarket or street. One of our key themes will be *Co-opetition* as we envisage convening multiple suppliers of complimentary industries.[3] We are not building a platform. We are building components. We build a horizontal layer that can be plugged in different clouds and platforms. We open that platform for third party developers that should fit into as many as possible platforms.

TagItSmart! will engage throughout the projects lifetime and especially *after* with communities in different business domains leveraging networks of our project partners.
PICOM will support interaction with retail industry, UPC with pharmaceuticals and value added packaging, DNET with agriculture and gaming, DUR with textile industry, Unilever and UNIEX with the consumers to promote the concept globaly and to create interest for project solutions through a co-creation approach.

Prior to the project some suitable existing technology focused ecosystems that can be leveraged have been identified, such as *FIWARE communities* and *AIOTI* and *IERC* to leverage the open platforms (open-platforms.eu), *GS1*, *oneM2M*, *OE-A Working Group Sustainability, AllSeenAlliance* to enable usage of FCs and TagItSmart! enablers in home automationand monitoring food deliveries, *Open Interconnect Consortium* to align TagItSmart! enabled objects to communicate with other IoT devices and connect to existing platforms by relying on existing standards, and the *Web of Things Community Group, W3C*.[4]

The first year was predominantly spent on building internal cohesion in use case requirements, Open Call requirements, EU broader policy Ecostystem building around the Circular Economy, the IoT EPI Challenge and a Linkedin Group with interested parties.

TagItSmart is a media sensitive project. Communication to stakeholders and foremost citizens must be engaged to build relationships with consumers. Having excellent relationships with endusers is crucial as more B2B will become B2C or even C2C, due to the nature of IoT that favors leasing over ownership and needs access to aggregated datasets of services and appliances to reformulate new relevant offerings. Businesses can maximise value from the resources they already own by circulating materials in closed loops, first smaller (product reuse, remanufacturing), then larger loops (recycling). Hence the name – **circular economy** – for a new economic model that benefits businesses and citizens, while also regenerating natural resources. The main bottleneck is the granularity of data sharing among all stakeholders, public, private and personal.[5]

Section 1- Building communities through the main policy drivers

1.1 Intelligent Object and Circular Economy

I think the message to the IoT community is the key – as with adoption of ICT, the adoption of circular principles will be done by each sector in its own way, but it is the IoT industry that spans the entire value chain and can therefore make a systemic contribution. So if the IoT community starts to design for a circular economy, rather than the old "linear" economy, then it can be a game-changer for all the industries involved, I believe! - Monika Schroeder.

1.1.1 TagItSmart Policy Ecostem Meeting 1, June 27 2016

A TagItSmart Ecosysyem Meeting on June 27 2016 with Gérald Santucci[6], Adviser for "Cross-cutting Policy / Research Issues" in DG CONNECT at European Commission, and Monika Schroeder, EC, DG CONNECT resulted in the following policy input.[7] Businesses can maximise value from the resources they already own by turning waste into wealth, and circulating products and materials in closed loops, first smaller (reuse), then larger (recycling). Hence the name – circular economy – for a new economic model that benefits businesses and citizens, while also regenerating natural resources so that this win-win-win cycle can be sustained.

The Internet of Things (IoT) is the key enabler: IoT and circular economy are both about a complete system reinvention, and they are both about smart, informed management of assets. Pioneer companies used circular design already before the digital era but now with the use of IoT technology the game changes entirely: it creates the data- and feedback-rich systems that allow circular designs and business models to thrive. DG CONNECT has expertise on the technologies to make circular manufacturing and recycling "Internet-ready". The special role that DG CONNECT can play in EU circular economy policy is based on our understanding of the central role of information flows in enabling the material flows throughout the economy. What is new – and proposed here – is to look beyond the narrow sectoral solution. The systemic "closed-loop" thinking, as a new idea, has to be integrated into the mainstream IoT understanding of the entire IoT value chain.

Their question is: How could TagItSmart contribute to the CIRCULAR ECONOMY?

The European Commission published a new *EU Circular Economy Package*[8] in December 2015, with an action plan addressing the 'full circle' from production and consumption to waste management and the market for secondary raw materials, to create the circular flow of materials necessary for a regenerative economic system. There are also sector-specific measures on plastics, food waste, critical raw materials, construction, and bio-based products. The proposed actions will contribute to "closing the loop" of product lifecycles through greater recycling and re-use, and bring benefits for both the environment and the economy.[9]

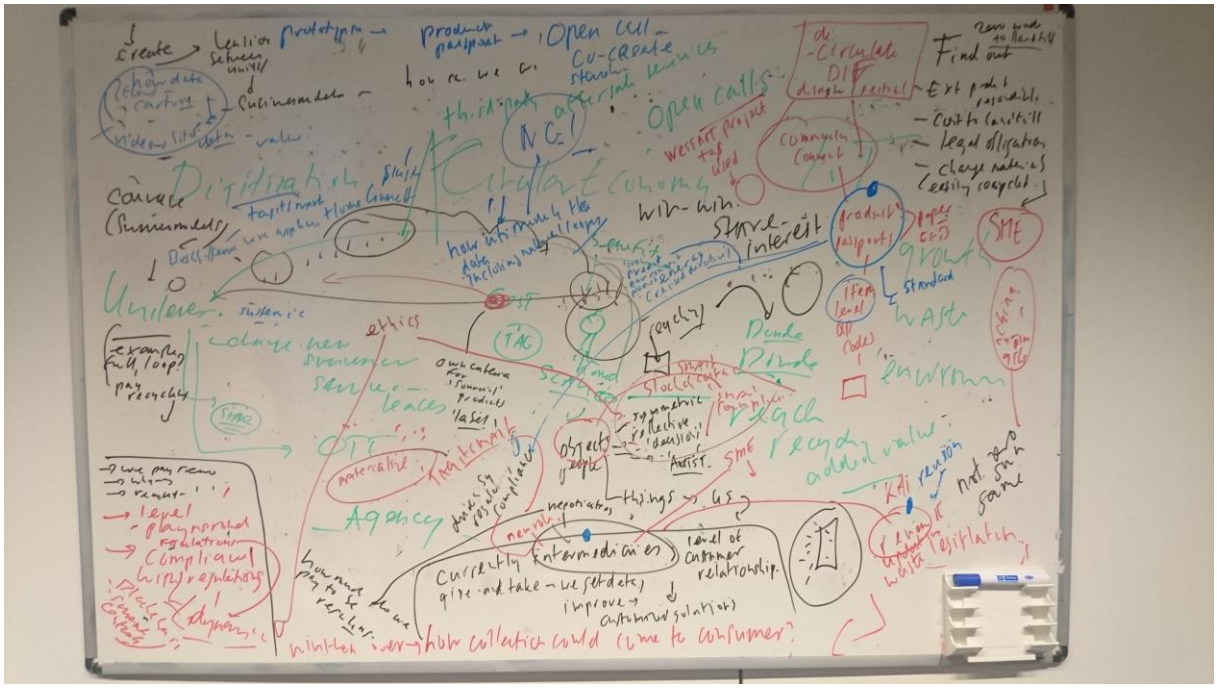
Intelligent Assets: Unlocking the circular economy potential[10], finds that "pairing circular economy principles with the information generated by intelligent devices creates a fertile ground for innovation that could enable this decoupling, and lead to broad social benefits."[11] "With up to 50 billion connected devices predicted by 2020, a pervasive digital transformation is reshaping the economy. Will this 'fourth industrial revolution' lead to an acceleration of the extractive, 'linear' economy of today, or will it enable the transition towards a society in which value creation is increasingly decoupled from finite resource consumption?"

Products will communicate with users, collectors and remanufacturers to ensure they are returned and reused after their first life cycle. Additionally, condition monitoring of sensitive goods during transport, storage and use will expand product lifetime, says Frank Appel, CEO of Deutsche Post DHL."[12] Intelligent Assets establishes an interplay between the 'value drivers' of a circular model, and the potential benefits offered by a network of connected devices and information.... "*The internet of things, with its smart sensors and connected technologies, can play a key role in providing valuable data about*

things like energy use, under-utilised assets, and material flows to help make businesses more efficient. Their role in building a future with a more circular economy is critical and we are excited about the role of technology will play in realising this vision."

IoT applications already are emerging in the waste management sector, there are also EU-funded projects.[13] DG CONNECT has done a study on the use of RFID for waste management, as well as the recycling of RFID tags.[14]

1.1.2 TagItSmart Policy Ecosystem Meeting 2, October 21 2016[15]



Picture 1 The result of co-creating requirements in a free and informal setting.

In a second Ecosystem meeting[16] the focus was on how to maximize the win win win story for economy and business, circular economy and waste management and regulatory frameworks and policy initiatives towards national governments as well as the next Commission? Present were Gérald Santucci (EC), Monika Schneider (EC) and Carsten Wachholz (Senior Policy Officer on Product Policy and Resource Conservation at the European Environmental Bureau (EEB).) Magnus Gislev, European Commission. Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs provided additional information on Resource Efficiency and Raw Materials.[17]

Roles of individuals, companies, city, government, EU are becoming more fluid. This leads to innovation but also to insecurities, especially on funding capabilities and Return on Investment (ROI).
New business models and new regulatory models need to be co-created with the different actors; EU, NGO, city, SMEs, individuals and large service providers. It becomes clear that private Over-the-Top (OTT) players cannot regulate the negative effects of their success for the local living ecosystem. It is also clear that individuals will not go back on their connected powers.

Therefor agency must be shared and co-created, e.g.

- Individuals need control over the data from their wearables, homes, cars and civic identities; and the authorities need access to it where relevant and legitimate.
- To co-lead the developments, companies need to have assurances that their investments are safe. They can provide scalability, guaranteed up time, and sustainability.

There are three main issues:

1.1.3 The role of objects

What can be the added value in terms of the lifecycle of products of a product being “smart’?
What if smart objects “refuse” to be thrown away?
Can the level of customer relationship be enhanced? Rewards? Gaming?
Does it make sense to have an Open Call targeting this new potential of tags and objects to be an integral part of a regulatory framework?

1.1.4 The role of the intermediaries

If we are arguing that we need a more dynamic environment because of IoT enabling new data streams and new business cases in very short cycles, then the validation and evaluating mechanisms could be more dynamic as well.
Currently the evaluation and validation is in the hands of intermediaries. These are dependent on the information from the companies and they check if this is compliant with the regulations.
The issue is that there is no incentive to ask for more market validation or real-time reality checks until the next round of regulation. Therefor intermediaries do not only miss out on the potential innovation of IoT/Intelligent objects but might actively work against investigating potential benefits as this could threaten their role.

1.1.5 The Product Passport

The political context: The European Resource Efficiency Platform (EREP) policy recommendations to the European Commission in March 2014[1]:
“Inadequate business-to-business information on what resources a product contains and how it can be repaired or recycled is hindering resource efficiency. To tackle this barrier, the possible use of a “product passport”, such as an Environmental Product Declaration, should be explored that would make such information easily accessible and applicable ta the supply chain, thus facilitating efficient material flows and encouraging the creation of value in the circular economy.”
Different stakeholders agreed on the basic idea. EU level would be most relevant to build on existing schemes or proposals, such as Cradle to Cradle[2] passports, Environmental Product Declarations, product fiches for Energy labelling and/or Ecodesign regulations, chemicals passport summarizing information obligations under REACH and RoHS[3], Recycling passports for WEEE[4].

Possible impacts and synergies:

- Enhance a digital society with online purchasing and procurement;
- Improve possibly market surveillance (very short as a pure suggestion/opportunity);
- Trigger a sound competition between products through immediate comparisons based on CE-related information;
- Build on/enhance effectiveness cf. existing instruments such as EU Ecolabel[5] or Green Public Procurement (GPP) criteria”[6].

1.1.6 TagItSmart Policy Ecosystem Meeting 3, November 28

In a Meeting with Kiti Gjerstadt, Political Advisor at European Parliament, working in the office of MEP Sirpa Pietikäinen (EPP) concentrating on circular economy and resource efficiency as well as green financing; speech and article writing and policy briefing, the notes on the product passport were finentuned to being actionable for the specifications for the Open Call. The following questions emerged as material to investigate in Y2.

1 http://ec.europa.eu/environment/resource_efficiency/re_platform/index_en.htm
2 http://www.wipo.int/wipo_magazine/en/2007/02/article_0002.html
3 http://ec.europa.eu/environment/waste/rohs_eee/index_en.htm
4 http://ec.europa.eu/environment/waste/weee/index_en.htm
5 http://ec.europa.eu/environment/ecolabel/
6 http://ec.europa.eu/environment/gpp/gpp_criteria_en.htm

- How possible is it to check if IoT is or can be an item to be addressed in the current revision of EU waste legislation, from the perspective of Horizon2020 IoT R&D and tagitsmart.eu, not from individual technology providers?[18]
- Can we 'hardcode' regulatory information on the TagItSmart Tag itself?
- *"We need a new business logic. More circular business models must replace the linear economy, featuring the following practices: multi-storey buildings built of wood; electronics designed for longer life and for components to be used again; car plants following the example of Renault, and taking back old engines, renovating them and using them in new vehicles; tyre manufacturers, like Michelin, offering tyres for lease, charging per km of use; clothing companies, like Mud Jeans and Houdini offering clothing for rent and lighting companies, like Philips, providing lighting as a service."*[19]

One of TagitSmart's bottlenecks is the quantity, quality and granularity of data shared among all stakeholders, public, private and personal.[20] In *Data sharing and analytics drive success with IoT. Creating Business Value with the Internet of Things*, Stephanie Jernigan, Sam Ransbotham, and David Kiron, state "We found that obtaining business value using the connections the IoT creates between an organization and its customers, suppliers, and competitors depends on companies' willingness to share data with other organizations."

This leads the *European Environmental Bureau* (EEB) in their text *Circular Economy Package 2.0:, Some ideas to complete the circle* (March 2015) to the conclusion: "Inadequate information passed on from one business to another on what resources a product contains and how it can be repaired or recycled is hindering efforts to improve resource efficiency. To tackle this barrier, the use of a 'product passport' should be explored." In 2013 *The European Resource Efficiency Platform,* a high-level group comprised of business, government, consumer and environmental representatives, that was not continuated, issued recommendations saying that product passports would improve resource efficiency, encourage innovation and generate jobs across Europe: "This passport will, if adopted, be a key building block in the institutional infrastructure of a sustainable society," said John Burton, a former Irish prime minister and EU ambassador to Washington who chaired.[21] EU waste legislation that is currently being reviewed is envisaged to include an obligation for the Member states to "incentivize the extension of the life span of products and support the setting up of systems promoting repair, re-use, remanufacturing and reconditioning activities of products --", furthermore Member states shall..."reduce waste generation in processes related to industrial production, manufacturing, extraction of minerals, construction and demolition, including means such as pre-demolition audits and building passports, to commerce and services, taking into account best available techniques and best practices". The logical step towards leasing instead of owning products in Internet of Things (upgrades are already build in), and selling services (clean water instead of pulps, Grundfos) instead of products, align with the proposition that in a circular economy, products would "ideally never become waste." *"This would mean that products would always remain the property of the company that makes them. The company would take back obsolete products and remake them into new ones. Companies are increasingly experimenting with sharing or "product service utility" business models – for example BMW with electric car sharing, and Philips with its "pay per lux" lighting scheme. Product passports might be useful in some contexts, such as fast-moving consumer goods that are difficult for manufacturers to retain control of."*[22]
Working on shared data propositions throughout a value chain along the lines of a product passport mlght be a strong enabler for helping companies to explore and adopt new businessmodels.

1.2 Digitization and personalization: how to balance two seemingly contradictory business drivers?

Lee Vinsel & Andrew Russel claim in *Hail the maintainers* that: "Innovation is a dominant ideology of our era, embraced in America by Silicon Valley, Wall Street, and the Washington DC political elite. As the pursuit of innovation has inspired technologists and capitalists, it has also provoked critics who suspect that the peddlers of innovation radically overvalue innovation. What happens after innovation, they argue, is more important. Maintenance and repair, the building of infrastructures, the mundane labour

that goes into sustaining functioning and efficient infrastructures, simply has more impact on people's daily lives than the vast majority of technological innovations."[23] They emphasize a shift from means, "including the technologies that underpin our everyday actions, to ends, including the many kinds of social beneficence and improvement that technology can offer."[24] Roles of individuals, companies, city, government, EU are becoming more fluid. It becomes clear that private Over the Top Players can not regulate the negative effects of their success for the local living ecosystem. It is also clear that individuals will not go back on their connected powers. Agency must be shared. Cities and the EU need more control over the data from their citizens, machines, and processes, to facilitate sharing services, including waste management, by local entrepreneurs. Individuals need control over the data from their wearables, homes, cars and civic identities. And companies need to have assurances that their investments are safe. They can provide scalability, guaranteed up time, and sustainability. But they can no longer lead the developments. This leads to innovation but also to insecurities, especially on funding capabilities and ROI (Return on Investment). New business models and new regulatory models need to be co-created with the different actors; EU, NGO, City, SME, individuals and large service providers. An important philosophical building block in a larger policy framework and potential inspiration for scenarios is to move the decision-making capabilities into a more relevant balance between actions taken from IoT scenarios and current party politics.[25] In Accelerationist thinking: "quantification is not an evil to be eliminated, but a tool to be used in the most effective manner possible. Economic modelling is – simply put – a necessity for making intelligible a complex world. The tools to be found in social network analysis, agent-based modelling, big data analytics, and non-equilibrium economic models, are necessary cognitive mediators for understanding complex systems like the modern economy."

Action Point for Y2

Internally: What is the abstract relationship between Digitalisation and Circular Economy related to #IoT (and pragmatically the potential role of DG CONNECT Unit "Internet of Things"). How we can maximize the "win win win" story for (i) economy and business, (ii) circular economy and waste management, and (iii) regulatory frameworks and policy initiatives towards national governments as well as the next Commission?
We would like to achieve:

- ✓ Level playing-field
- ✓ Compliance with regulations in a new stakeholder model that can adjust quickly to market realities and innovation/disruption because of IoT
- ✓ Investigate how smart contracts in Blockchain like protocols can 'hardcode' regulatory frameworks.

Section 2- Identifying and building community through desk research and interviews with partners

Task 5.5 describes how the topics of the calls (domains to address, new platform features to create, etc.) will be decided using the WP6 driven co-creation process with the community and will be detailed through the generation of call tekst. We describe various input drivers: specification from partners, horizontal project dependent, and the broader ecosystem.

2.1 Fujitsu, end user engagement and retail (interview and meeting at Fujitsu Hayes, Oct 24)

Dave Snelling, *Fujitsu* is shifting toward service-oriented solutions and the role of the Innovation Lab aims at early wins. That is why one of the main challenges is to have at least one usecase that can demonstrate the killer function of the dynamic nature of the tag - the sense-actuate- result/change in 'state/price/context as in M6-M12 the lab wants to raise additional funding from the business units. Showing the use of the solution quickly is key. Dave Snelling sees six main issues:

- Early and continuous monitoring of the potential tension between the strong open source focus that is written in the proposal and the closed solutions offered by commercial existing platforms.
- Early succes needs to be shown as additional funs inside company must be gained. This has implications for the use cases. The added value of the functional code must be shown M6-M12. Early demonstrations.
- Early contacts with standardization bodies. Long standing member of ETSI — good contacts: M2M, 3GPP, mobile edge computing.
- Fujitsu is B2B mainly. In our TagItSmart scenarios we will also have citizens as endusers so issue around privacy will become paramount. Strong engagement with social media therefore paramount in terms of engagement:
- When I take my phone and scan after the end of a recycling exercise I send info to Unilever and thus personal information: number of phone, location…
- It is important that the project keeps the focus on the key innovation: to show clear effect of the scanned section, what happens after the scan should be meaningful and exciting (analytics/coelition) So we should look for high value usecase and customer with those use cases. Recycling is CSR. It is an important full loop but we should not argue the use cases from this position.

One of three main issues for Fujitsu is to bring the business units on board. This is also crucial for the success of Horizon2020 which is about impact and sustainable growth. One of the outcomes of Ecosystem Building will be a generic approach to breaking the barriers between R&D and the business units focusing on the nature of 'business moments'.[26] The use cases must trigger aspects identified as IoT strategy by the business units. The Open Calls are a potential instrument for bringing the business units on board. Interested clients in the dynamic tagging contexts are potential participants in the Open Calls. As the goal of the Open Calls is to foster the ecosystem business uptake of the TagItSmart partners, requirements gathering of all potential participants will lead to a level playing field based on conditions favourable to the use cases.

Fujitsu is a full B2B company that has very limited understanding of the human individual as end user as it normally does not deal with them directly. In the current Digital Transformation caused by acceleration of #IoT (as pervasive computing, ambient intelligence, ubicomp+ Cloud) more and more middlemen are taken out by the cheapest ecology of hardware, software, storage and analytics coupled with a growing agency of an end user (individual) to scale horizontally and the growing agency of any producer to personalize offerings tailored to one-many (meaning that a personalized offering of 'one' can become many quickly if it also suits the needs of others). B2B is the least attractive position to be in in the current situation that will never again be in 'rest', as business models can change with each new use case.

TagItSmart with its broad context of Circular Economy and focus on recycling by end users brings a strong potential to engage with citizens in a way that is relatively new to Fujitsu. Fujitsu has been very perceptive of the first wave of repercussions of #IoT and has become a strong player in Industrial Cloud realizing the commodification of hardware would eat into their main offerings. This position will hold out for several (five) years and offers a timeframe to investigate new niches of action that bridge the Industrial expertise potentially to a consumer perspective of personalized clouds (e.g. healthcare). Here also TagItSmart could lead to new services by tagging things in a smart way.

One of the most promising directions is to investigate the notion of dynamic pricing not on the nature of properties of the item, but on the profile of the user. Council research indicates that dynamic pricing will be the killer app of IoT in retail. Offerings on price will no longer be fixed or static in supermarkets, restaurants… but based on a profile that determines currently the indicators that offer you your price for any online purchase. It is currently unclear which companies are setting the indicator levels. This might be a strong opportunity for Coelition. It offers a strong privacy enabling framework based on actual behaviour, and could thus form the more broadly acceptable basis of such a new practice that has social and political far reaching consequences.

This input led to investigate the notion of dynamic pricing not on the nature of properties of the item, but on the profile of the user as part of Open Call and extended use case building in Y2.

2.2 Unilever, end user engagement and recycling (interviews and meeting at Port Arthur, May 10)

"We need a new business logic. More circular business models must replace the linear economy, featuring the following practices: multi-storey buildings built of wood; electronics designed for longer life and for components to be used again; car plants following the example of Renault, and taking back old engines, renovating them and using them in new vehicles; tyre manufacturers, like Michelin, offering tyres for lease, charging per km of use; clothing companies, like Mud Jeans and Houdini offering clothing for rent and lighting companies, like Philips, providing lighting as a service." (source[27])

Richard Wright states that *Unilevers* context is behaviour change. Which stakeholder do we need to change most and what can we achieve in three years and how can we make it sustainable. The core issue is to design consumer goods that are not just made desirable but also easily recycled and reused. *We need a system perspective*. Consumer behaviour is at the heart of the business and key is to take the industry with us. Smart tags are not hugely differentiated, the technicality seems difficult, so the main question will be what can they do, that we cannot already do now with competing technologies that are more mature.

On the 10th May, Unilever hosted a visit by Rob van Kranenburg and Delfina Fantini van Ditmar[28], to present on the Internet of Things. The presentation covered a broad range of topics; the history of the internet of things; current technologies available; attitudes to security, privacy and legislation; pitfalls and problems to wide spread adoption. TagItSmart – and Unilever's role within in – were also presented – with the message that this project has a potentially much broader impact than the detailed use case in development. The audience consisted of a wide-ranging group from within Unilever Port Sunlight – research scientists, program directors, packaging experts, consumer scientists and product category specialists. After the presentation, a lively debate ensued. Follow up actions are currently being collated.

The PhD by Delfina Fantini van Ditmar explores the place of the human as an observer within Internet of Things (IoT) technology, particularly in the context of the 'smart' home. Looking at current IoT practice, she investigates the extent to which human subjectivity and the complexity of our existence is dealt with and represented. Then, adopting a second-order cybernetics approach—in which the 'observer' is included as an integral, necessary and desirable part of any process—she developed a series of practice-based projects, including one where she 'became' a smart fridge algorithm. From this

reflection, a new set of questions emerged, distinct from current practice, that should be addressed by designers working in the IoT and "smart" home fields. See also her framework in Sharepoint WP6.[29]

This research is relevant to our trials in which there are three consumer journeys:

- ✓ In the home: the (smart) bin in your kitchen
- ✓ A central point at the supermarket: the (smart) bin/collection point
- ✓ Bins in streets: in the "wild'

The *Unilever staff* that has been working on the recent report INTELLIGENT ASSETS and they are interested in linking with TagItSmart because of the focus on the full lifecycle of product, the scanning at a completely different point, the optimization if recycling goes well and potential reuse of packaging/design to refill.

Eduardo Pinheiro writes in *How Retailers Can Overcome Negative Perceptions of the Smart Home:* "A recent survey conducted by Support.com, 67 percent of potential connected device buyers said the cost to buy, set up and maintain a smart-home system is the number-one barrier to purchasing connected devices for the home. Consumers may not be seeing the full value in connected devices, causing them to forego their purchase or stop after just one device. With price and installation as driving factors behind purchasing decisions, it's important for retailers to recognize obstacles and make the complete value proposition of smart-home devices known before consumers leave the store or check out online."[30]

In *How Smart, Connected Products Are Transforming Com*petition, Harvard Business Review, November 2014, Michael Porter and James Heppelmann argued that, because products will be linked in real time to the manufacturer's operations, to other products, and to third party service providers, "IoT may change the power of rivals, substitutes, new entrants, suppliers and buyers in existing industries." There will be "a potentially dramatic transition of power to data analytics intermediaries that will conduct "data-facturing."[31]"

All participants were invited to join the TagItSmart LlinkedIn group to continue interaction.

This input led to investigate as a core issue to design consumer goods that are not just made desirable but also easily recycled and reused.

2.3 Donde (matchmaker) and eReuse, Ecosystem Meeting in Ghent, December 8, 2016

Donde also thinks that the Open Call is important to use strategically for the smart bin. We need to create a thing, an attachment for a bin. We may not have much engineering capability in the context within the Consortium. There is a budget for a field trial. One of the key players that can be approached is Enevo[32].

This discussion led to a follow up meeting between Ecosystem manager RD and David Franquesa, *eReuse.org* project coordinator in Ghent on December 8 2016. eReuse has created Open Source technology for reusing electronic devices, extending their lifetime through ensuring repair, refurbish and final recycling; they have developed some tools and distributed services to maximize circularity of digital devices. TIS works in the first phases of a product's lifetime, and eReuse works in the final phases. They discussed how both systems/technologies/platforms/solutions can work together.

Donde also introduced *Recyclia*, the Spanish foundation of electric and electronic devices manufacturers. They propose to track a used washing machine once the retailer sells a new appliance (as they are forced by law to collect the old one when someone buys a new product) or when it is delivered directly by the user in the shop (mainly small appliances). They are also forced by law to track these appliances until their end life. Smart Tags can be a good and cheap way to do so. They are willing, not only to tag the appliance if it is broken and ends up in a waste manager, but also track it if it works

(they know this because they can directly ask the user) and provide traceability to prepare the appliance for reuse. All this information can be provided back to the end user.

This input leads to investigate synergies in Y2 between this proposed collaboration (that miight be an Open Call proposal) and the TIS use case on Home services. As Leroy Merlin is one of Recyclia' associates in Spain, we could apply the Home Services use case in France. This can be a good way to include in TIS products that will have a longer life and that will not be delivered as waste items until 10 years of work.

2.4 Picom, new business models, the retailer as service provider (interview and Ecosystem meeting in Lille, Nov 10)[33]

A good usage of the heating equipment (e.g. a boiler and an associated filtering station) is one means to provide comfort and a healthy living at home. This implies proper 1) maintenance, 2) repair, 3) replenishment, and 4) monitoring. This use case will test different services to the customer all along the life of the equipment at home. Some of the services will leverage access to information related to the product, its environment and its use; and some will provide specialized services (installation, maintenance, repair, etc.).

Pierre Blanc thinks that strong links to AllseenAlliance and the recent http://openconnectivity.org Open Connectivity Foundation as well as more local and regional smart come alliances (the home is a potential space, linked up with our home recycling scenario) like Ignes and [34]CNRFID[35] Within the use cases, building our own extension to the PIA, Privacy Impact Assesment is of great importance as our approach to privacy/privacies can be a unique selling point. "CNRFID (the French National RFID Center) has partnered with Convergent Software Ltd to develop and market RFID Privacy Impact Assessment software. The European Commission has made it clear that the scope of the RFID PIA covers all radio frequency technologies, including smart cards and contactless payment using RF frequencies."[36]

The future of retailers will be to switch business to service providers in 5 - 10 years. The business models change with that paradigm shift. Customers will lease a full set of services across domains (home, work, en route…) and subscribe to services for sale or rent. The commercial battle will be in all domains and points of action. It is more about services after the shopping process, can you reach the customer at home at any time, or in the car, or at work? Dynamic pricing can be a key functionality. Retail is not the only candidate: banks, telco's, Google, Social Media and Amazon Homservices: "We have 85 million Amazon customers who have shopped for products this past year that often require a service afterwards," said Peter Faricy, vice president for Amazon Marketplace. "Things like TVs, toilets, and sinks." Today, the company is launching a new section in the US, Home Services, where customers can shop for professional help. It's launching with 700 different services, from the ordinary to the esoteric, everything from installing a garbage disposal to renting you a goat herd that will graze away the unwanted vegetation on your property."[37]

The question is; will retail be able to close the gap and survive? There is a strong urgency here, it is not just about a nice demo. This project is an opportunity to assess new services in and outside the store.

LeRoyMerlin is building a Connected Home offering that can integrate the TagItSmart solution at some point. In this case tags that react to air conditions, pollution, water, fire not only send an alert to the TagItSmart platform but also directly to the Home system so this can automatically control ventialtion, windows, notify persons…) We see an opportunity for co-organizing an evening in the Internet of Things Lille Meetup to investigate cheap water quality sensor focused on limestone filtering and alerting when this is above a certain level as it is not healthy for people and very damaging to equipment ie. boiler). This is a good opportunity for LeRoyMerlin to meet and engage with local makers, hackers, DIY.

At this point of the project it is difficult to find companies willing to use SmartTAG. We should have clear set of steps that include things like "How I can we add SmartTAG to our products?", "What IT challenges we have and how we solve them to join TagItSmart?" Thus, the next step is to develop the UC5 (home

services) with the consortium partners and Leroy Merlin solely. This presupposes a first effort for DNET, EVRYTHNG and RMP platforms integration before coding the UC services, followed by a series of workshops to connect end-users and the consortium members. At the beginning of 2017, when starting the 1rst open call, it will be necessary to

- Operate the TagItSmart platform in our Shopping Innovation Lab
- Organize presentations of the open call to other retailers and SMEs

Picture 2 Attendees Régis Mertz, Thibaut Lehoucq, (Leroy Merlin) Srdjan Krco, Svetlana Krco, (Dunavnet) Pierre Blanc (PICOM), Rob van Kranenburg (Resonance Design)

In preparation of these tasks an Ecosystem meeting was organized by Pierre Blanc (PICOM) to discuss *How can information along the Tagitsmart use case journey follow, document, steer the purchasing journey?*

Objective:

- share overall use cases and architecture
- design “home services” use case with Leroy Merlin

Outcomes

- Workflow between consumer, retailer, service provider
- Consumer app first mockup

We discussed three potential scenarios: home services (boiler maintenance/warranty), water quality assurance (limestone in Northern France area), and home safety. Ideally you buy a set of tags in LeRoyMerlin. A tag can be a product in itelf. For example, a carbon dioxide sensor/code, an air pollution code. Or if you have painted a room the tag can tell you when it is safe for children to sleep in. There are two outer ends in/of the home services scenario.

- It becomes an *added service* on top that you suscribe to. A customer pays for a subscription that the producy – boiler – is always automatically serviced in time to be in warranty for the insurance. At point of sale, LeRoyMerlin automatically schedules maintanance dates with a

preferred service provider and (nice to have) sends this to the customer as well thoigh ICAll or sms a month before the visit.

- *Cost cutting*: authentication and verification of the warranty just through consumer scanning the tag. This is the ideal #IoT solution.

A customer can decide can choose at point of sale to go for the subscription model (pay per month, no alert, always safe in hands of Leroy Merin) or the alert when maintenance is needed. Then a list of providers and quotations is presented. *One customer can be a service provider for another.*

We bring data into the value model through all stakeholders; producers, retailers and consimers provide information. Business rules decide who will be getting what; sharing data is a major issue. Components will enable you to build, scan, print and add information in the chain. Services, platform and sensor infrastructure (capteurs) are decoupled, allowing different retailers and investors to share generic infrastructure, schedule update and version management, share security and trust mechanisms and compete on services through and added layer consisting of API's for Retail.

All participants were invited to join the TagItSmart LlinkedIn group to continue interaction.

This input leads to investigate gaps in our enablers like anonymization, security, and blockchain and/or new services, pilots, like recall and re-order in the case of retail. We also want to limit the amount of notifications end users will be getting from devices to avoid cognitive overload and IoT fatigue (more hassle then convenience) and thus it also requires innovative usability and UX solutions.

2.5 Univerexport: Cold chain, dynamic pricing, Ecosystem Meeting in Belgrade, November 8 2016.

The use case focuses on supply chain monitoring of fresh meat and is driven by Univerexport (UNIEX) based on the needs and the potential for improvement of work processes and quality of service offered to consumers. The use cases and scenarios need to be meaningful to what happens *after the tag* changes state for all involved stakeholders, retail and consumers. Research shows that time temperature indicators are not always promoted by retail stores, as they do not want customers to 'choose the best'. This attitude can be changed if there are more trade-offs for the store involved in this process. (VTT)

On November 8, 2016, a meeting/workshop with TagItSmart stakeholders from retail, food production and logistics domains was held in Crowne Plaza hotel in Belgrade. The workshop was organized by UNIEX. RD and DNET took part in the workshop as well.

The following stakeholders were present:

- NELT: distributor, logistics, brand representative
- Lactalis: Diary processing, French HQ, runs a factory in Serbia, producing well-known brands of products
- Coca-cola: in addition to soft drinks, bottles water in Serbia
- AD Backa: farm and meat processing plant, a member of Univerexport group
- In-store magazin: the leading FMCG publication in the region, organizing the largest regional FMCG events
- Henkel: German manufacturer, factory in Serbia producing laundry&home care and beauty care products
- Chamber of commerce of the city of Belgrade: supporting businesses and link to other industrial domains
- Frikom: the largest producer of frozen food products in the region
- MolsonCoors: international company owner of a number leading beer brands, brewery in Serbia one of two largest.
- Tamara Drecun: consultant for food industry, experience from chocolate products related business.

The workshop started with an overall presentation of TagItSmart project, followed by presentation of Dynamic pricing use case. It was followed by a lively discussion with stakeholders about the potential of using TagItSmart technology in their line of work. Different scenarios were investigated, challenges and opportunities identified in each of the present companies.

A general conclusion was that TagItSmart technology offer is of great interest to all of them. The ability to have a direct link to consumers is a great benefit. While this is of great importance to all actors in the value chain, it is more important to manufacturers and distributors as presently that connection is controlled by retailers.

Action Point for Y2.
Potential synergies are being investigated with WAZIUP, an Open Source IoT and Big data project for Africa. They are exploring the transport of fishes respecting cold chain from fish farms in North Ghana, at Kumasi to south in Accra. A webinar will be organized in Y2.

This input leads to investigate understanding potential business model related to data sharing, the cost and speed of printing the tags and associating them with products, data privacy as well as potential abuses of the system by consumers and changes in legislation that will be required to fully benefit from the potential solutions (displaying prices on the shelves).

All participants are invited to join the TagItSmart LlinkedIn group to continue interaction.

2.6 The Digital product use case involves the whole value chain; manufacturer, transport, retail, and recycling.

UpCodeWorld like to have in OpenCall candidates which are interested in to use SmartTag to prevent illicit trade. There are many possibilities how SmartTag technology can be utilized in this area. Examples: checking genuine products, In transport custom controls and grey import etc. Ingmar Polenz, *Durst* claims that as a platform provider for ink printers (label industry, packaging industry and textile industry) the packaging industry could benefit from this. Especially given the conservative mind-set of the large corporations, it is important to highlight solutions that show a *clear security printing purpose* (counterfeiting) and at the same time through the *design friendly/decorative tag* a proof to the customer - *I have the original*.

This use case extends a base use case for fast-moving consumer goods (FMCG) that want to become "smart" via SmartTAG and TagItSmart. It combines novel solutions, and enabling technologies and tools to create smart solutions for the whole value chain; manufacturer, transportation, retail, consumer and recycling, In the case of consumer enagement, direct access to production data gives consumer more value and drives decission making process. But it also makes it possible for manufacturer of the product the got more reliable and realtime consumer behaviour data. As communication is direct and two-way new business can be created. For example, product callbacks can be made more efficiently and users can order customised products.

The idea of this use case is to implement a system/technology that allows the lifecycle management of every fast-moving consumer good (FMCG), or consumer packaged good (CPG), that motivates and helps companies and citizens recycle their waste items, overcoming and solving current limitations and problems.

Input for the Open Call requirements led to an Ecosystem question from Tomaz Vidonja who invited TIS to the IoT event in the CEE region »Living bits and things 2017«, will be held june 19-20, 2017 in Bled (teh 7th edition) and is liasing the contact for a number of micro breweries interested in the Digital Beer usecase.

2.7 The relationship between closed platform and open source enablers

WP4 has 82 man months for platform development and development of a significant number of open source components. What will be commercial and what will become available to the community?
According to Pierre Blanc *the open source aspect* of what we will eventually deliver (a new platform or a set of enablers that can be patched on to different platforms) is very important. In France Leroy Merlin is taking the lead to bring other retailers into a common platform to have a chance against the Over the Top players like Amazon. The potential tension between open and closed is also seen by *Thinfilm*'s Torbjörn Eriksson & Per Bröms. In WP4 in principle with EVERYTHING and RMP we are building on commercially viable proprietary protocols and we understand the need for that but there has to be some kind of open source community shell patched onto or on top of these systems with a very clear consumer as well as brand interaction.

2.8 FIWARE and HYPERCAT

Stylianos Georgoulas & Colin O'Reilly from *U Surrey* can liaise with Hypercat and FIWARE. They also see, especially the first Open Call is important to draw FIWARE engagement. They will keep track of relevant similar research projects and consumer associations. FIWARE's direct funding indeed will be officially finishing at the end of 2016 at the latest. In addition to FIWARE there are the FIWARE accelerators (trying to promote FIWARE components to SMEs etc under various themes, smart cities, ehealth) but these are also coming to an end. However, it seems the EC still tries to keep FIWAR alive; e.g. under H2020-ICT12-2016 call, its Innovation Action part is fully dedicated to building and suppporting an open community of FIWARE innovators and users. So from our side we will be monitoring the take-up of FIWARE components (especially ones relevant to TagItSmart) through these EC initiatives/calls. HYPERCAT project is a different beast; the project claims it will continue to promote their solutions after July 2016 (when they officially end) but there is no strong proof/commitment (as in the case of FIWARE) that this will materialize. So for HYPERCAT we will keep an eye but it may be the case that there won't be any active support or maintainance in the long term in which case, if we see that, we should better not take-up any of their solutions.

2.9 UpCode, PICOM, DURST: Generation Connected: Video, Gaming, Marketing 'Cool factor'

Wild cards e.g. young people without academia or positions to give wild concepts for our project Open Calls can be used to try to engage creative and [38]'wild' concepts from Generation Connected. One way to engage them is through the Meetups (10.1) This relates to the brief discussion on the 'coolness' of QR codes. If the act of QR code scanning is as 'uncool', why is that so? (See Are QR Codes Dead?[39]

This video[40] is part of a Dutch campaign for retaining the deposit scheme and is posted on a special Facebook page, called 'Statiegeld moet blijven' (keep our deposit scheme). This social experiment shows how an incentive affects people's behaviour and their willingness to pick up litter. Unsuspecting Dutchmen were faced with a large pile of litter containing empty cans and bottles without deposit next to a sign that said 'Pick up for free'. The video shows how people act surprised however not one of them felt the urge to pick up the empty containers. After a while the containers were replaced by plastic bottles with deposit, and suddenly people were very willing to pick up all the containers. Pierre Blanc states that we need to be creative in the use cases and bring in designers/artists. What we have is potentially the possibility of the tag to change its state more then once and adapt services to specific lifetimes of the product. We have to be very pragmatic and build use cases enabled to validate the concept of the smart code, with the recycle, re-use as a trigger.

Ingmar Polenz sees four main challenges:

- ✓ Ethics in data-management and privacy policies.
- ✓ Personal data like location are the new currency (of the future) and it should be clearly articulated what happens when with personal data.
- ✓ We need statistics of usage rates of QR codes. Is it already an old-fashioned technology?
- ✓ We have to have strong communication ambition, to get people to really like the packaging and the smart code. Videos and youtube communicate to a mass market.

TagItSmart can use the approach of HereHere and Precious[41] Plastic[42]: "HereHere's goals are to study how characterization can be a tool for data engagement. At the same time, researchers want to understand what sort of light, daily rituals are effective for connecting people to hyperlocal issues, as well as how to create compelling stories with data that can engage larger communities. These have been ongoing questions for London, whose career has focused on designing playful or disarming interactions that engage people or communities that might not bother getting connected without such interactions."[7] Also we can look at https://www.fixmystreet.com/# Report, view, or discuss local problems (like graffiti, fly tipping, broken paving slabs, or street lighting) in terms of building stakeholder coordination and local trust.

[7] http://research.microsoft.com/en-us/news/features/herehere-031014.aspx

8

TagItSmart started making an early animation[43] that was well received at #Netfutures 2016 and other Conferences. Digital teens think differently; they see a code and when implemented well, they see it as a design issue.

This input leads to investigate wild cards e.g. young people without academia or positions to give wild concepts for our project Open Calls that can be used to try to engage creative and [44]'wild' concepts from Generation Connected. What kinds of incentives for endusers can lead to allowing specific context-aware applications (like sound on mobile phone) and can labelling levels of rewards (points for products) help?

2.10 Recycing and re-use. Open Data to engage citizens in closing the loop of the product

Iván González makes a distinction between the network they have painstakingly build and the network they hope to create through TagItSmart. The current network[45] tool a lot of effort by contacting each municipality, offering them a free webpage. Donde Lotiro makes a press release for these partners that are small and bigger villages and cities as well as large corporations.[46] Suggestions:

- ✓ *Recycle Now* is the national recycling campaign for England, supported and funded by Government, managed by WRAP and used locally by over 90% of English authorities. Recycle Now has a lot of public involvement.[47]
- ✓ *Fixmystreet*[48]: Report, view, or discuss local problems (like graffiti, fly tipping, broken paving slabs, or street lighting) in terms of building stakeholder coordination and local trust.

Open Data is the way into the cities. Donde's partners are all in Spain[49] and the objective is to change that by offering actionable standardization of open data formats on waste management, recycling. As all these entities are open to discuss about available new technologies that can help them with their objectives they are willing to help TagItSmart implementing the use cases. The overall objective is to offer actionable standardization of open data formats on waste management, recycling and re use. The demonstrators from the project will be strong asset. Open Data is the way into the cities. There is EU law on waste management information so local authorities in principle are under obligation to comply.

2.11 Coelition

"It may be interesting that I scanned a product in the store and then did or didn't buy it. Both can be linked to me in the Coelition Data Engine, where the 'same consumer' association is maintained, but not my identity. This makes the data much richer and protects my privacy at the same time. When someone else (say my wife) uses or disposes of the item a similar bit of data is captured. If we are dealing with item level tagging and this maintained in the Data Engine, then some kind of association between two consumers (me and my wife) can be detected. The other things we both scan and buy or not can the share a relationship. All still protecting the privacy of both of us." (David Snelling)

[8] http://herehere.co/nabes

TIS could focus on the balance of gaining intelligence from the tag and from the actual involvement and engagement of end users, as well as the environment envisioned in the scenario (home, supermarket or street. This is where Coelition has a strong potential, and recycling becomes fundamental as we can show effect on consumer behavior.

This input leads to investigate a privacy setting 'app' that visualizes immediately trade-off between privacy and information usability, based on coelition.org and solutions involving Artificial Intelligence to think about new levels of automatic understanding.

2.12 Security, brand protection as a generic security tool

Together with functional ink, lifecycle management and item-level control enables brand protection in a way that cannot be faked. Different stakeholders are able to scan SmartTAG and see if the item has followed its predefined transport path, if the item really is sold in the correct place and if the manufacturer of a product really is correct one. Subject of this use case is the development of a whole security platform for goods which includes both the direct digital printing of a functional QR code on an article or the printing on labels or the packaging and the generation of suitable coding and decoding architecture that are deployed at the production process that is simply implementable by the manufacturer directly on the product periphery or on the packaging. More specifically the aim of this use case is the development of a security platform for originality proof to be implemented on labels and tags. The basic mechanism of the security platform is a light-induced colour switch of inkjet-printed textures within the functional QR code; the colour switch is initiated by the readout using a smartphone.

Two readout scenarios need to be considered. In the first instance, the QR code can be read out by common QR code reading software. However, an interlink to the second readout, whose mechanism is strictly protocolled using white LED illumination, including the photochromic switches of the textures needs to be implemented.

This input leads to investigate visual crypto, security/access control embedded in a layer of transparent paper, standardization issues, business traedoff -as adding complexity and cost when convenience is paramount - and mismanaging version management as potential requirements for the Open Call.

2.13 Printed electronics stakeholders Meeting, planned Spring 2017 (RD, VTT and Thinfilm)

This Meeting will be co-organized by the electronics partners, foremost, VTT Torbjörn Eriksson & Per Bröms, and RD. One of the aims is to bring them around the table as to discuss "the transitioning nano-bio technologies into volume manufacturing." *With:*

- ✓ The Web NFC Community Group that will create a Near Field Communication API that is browser-friendly and adheres to the Web's security model.[50]
- ✓ VTT[51]
- ✓ Printed Electronics and Sensors - INKtelligent printing®[52]
- ✓ Thinfilm[53]
- ✓ Printed Electronics @ Berkeley[54]
- ✓ FlexTech[55] has leveraged its time-tested intellectual property and invention ownership policies into several other organizations, including the
- ✓ Nano-Bio Manufacturing Consortium (NBMC)[56]

One of the bottlenecks of the project is the printing. Will there be a printer after the project, printing thousands a minute? HP's Instant Ink service provides printing-as-a-service to individuals and SMEs. Subscribers pay monthly for the number of pages they print, and the connected printer signals to HP when a cartridge is running low – a new one is automatically. HP collects and recycles cartridges in a closed loop. Dave Snelling sees three main issues: *Functional Ink*: What can we sense? Are we limited to black and white? How printable is the ink? Etc, *Tag Encoding*: Status of encoding multiple signals is a single tag. Novel coding strategies, etc. and *Data Analytics*: What tools do we have to plug into a business process to analyse and react to sensors? Thinfilm's NFC OpenSense™ technology will be

featured as a component of the TagItSmart platform, and end-users will be able to access several related use cases that highlight commercial deployment of NFC OpenSense in market. Therefore, one of the most important actors in our ecosystem is the NFC Forum, with strong players such as Google and NXP. The Web NFC Community Group will create a Near Field Communication API that is browser-friendly and adheres to the Web's security model.[57] The need to develop new business models for the project but also for their own industry is foregrounded. Currently the tags are components that are sold, so the more the better, yet on the software side the smarter the tags the more competition on the potential contexts in which they are embedded so that the real and full value can actually go via the hardware to direct software competitors. So different business models for the different systems selling tags and supplying the full system, need to be devised.
One of the highlights of the OE-A Working Group Meeting Frankfurt, Germany in October, 2016 was the official launch of the *OE-A Working Group Sustainability*. As the Organic and Printed Electronics industry moves into commercialization, the OE-A believes that sustainability is an increasingly important topic – that concerns our members, our stakeholders and the public. It is important that we look at our products and processes to identify how efficiently they are made, how well we use the materials with which we construct them and how well they use power and other consumables when in operation. Then, when the devices come to the end of their lifetime, we need to identify how they can be recycled or dealt with in a sustainable manner. The mission of the OE-A Working Group Sustainability is therefore “to identify and fully understand the sustainability benefits of organic and printed electronics technology, emphasizing its contribution to a sustainable future in an open dialogue with key stakeholders, the markets, regulators and wider society”.

This input leads to envisage a Smart Tag printer IoT service? How did the 3D printing services emerge from the first open source RepRap? Can a new ‘service/company’ be an outcome of the project?

2.14 The Open Call text

The Open Call text is work in progress. The initial versions were drafted during Q4 2016 with the goal to finalize it during January 2017. The best practices and materials generated by other H2020 projects are being used as the basis, in particular when it comes to the administration part of the calls. In cooperation with IoT-EPI the Open Call will be further co-created with the partners, IoT-EPI and earlier projects on the FS6 platform.

Drafting of the open call text was impacted by the feedback obtained from various stakeholders identifyied and approached durgin the activities described above in order to ensure the best possible impact and high level of interest from stakeholders.

Section 3- IoT-EPI involvement

3.1 The EPI- IoT-Meetup and the IERC, (October, Vienna)

Tagitsmart presented in the common EPI community event, the Meetup - on the 13th of October in Vienna. As part of the *Taskforce Internationalization* TIS participated in the session on International Collaboration. A meeting with Kathleen Olstedt from IOT-EPI was scheduled for February 7 in Berlin to determine a roadmap.
Tagitsmart Chairs AC4 from the IERC, Europe's Internet of Things Research Community on Hyperconnected Society, together with Martin Serrano (Big IoT) and Francesca Bria (CTO Barcelona). The presented roadmap was well received. Four notes will be produced on pressing #IoT issues. The kickoff text for Note Nr1 on Blockchain and law: *How the Internet of Things is leading to a major disruption also in the legal system and how we regulate transactions is published as* part of the series of guest posts named *Thoughts Leaders' Corner* in the blog Gaming Tech Law[58] of Giulio Coraggio, privacy and commercial lawyer at the leading law firm DLA Piper.

3.2 IoT-EPI Meet & Greet and Community Challenge (March, Berlin)

Harry Doukas (AGILE), Jelena Mitic (Big IoT), and Rob van Kranenburg (TagItSmart) co-created one of the 3 chosen IoT-EPI Meet & Greet and Community Challenges in Berlin (March 2017) in a series of telco's and iterations; the Retail Challenge[59]:

Sharing goods, resources and skills is becoming more easy and normal through the ability to track, trace and give feedback. Can we extend this practice to the everyday activity of shopping? Tons of good food are wasted every year in stores like supermarkets simply because they are not bought on time: expire date approaches and they are being disposed, while at the same time so many people are in the need. The challenge is to collect requirements from all stakeholders and design a system where customers can scan a good and buy it for someone who needs it. The goods remain at the shop. Receivers can check what is available and reserve it. Ideal for foods, for example, that could be purchased just before the expiration date

How could this app scale? What could be the benefit for shops? How can you can combine it with other marketing models? How can you combine data from the mobility domain with indoor location based information?

In this challenge[9], we'd like to see different aspects that are relevant: business, tech, consent (legal), social - shame, sharing, trust explored. AGILE enables indoor navigating, using BLE and phones or smart cards to authenticate eligible customers and notify what is offered. TagItSmart offers platforms Azure, RunMyProcess, EVRTHNG in combination with dynamic QR tags to help clients identify goods based on indicators that are still open to be purchased for someone who needs it. BigIoT enables outdoor navigating tools (mobility, parking, traffic data) for building a recommendation system and a market place. The outcome is a use case that realistically builds on the technical enablers in the form of and storyboards, mood maps, innovative visualizations of data flow and Customer Support Journeys.

Working on shared data propositions throughout a value chain along the lines of a product passport mlght be a strong enabler for helping companies to explore and adopt new businessmodels.

[9] Several experts from different domains involved in the current H2020 IoT research projects will attend the challenge and be available for support and discussions. Challenge hosts are Charalampos Doukas, Rob van Kranenburg, Jelena Mitic. Charalampos Doukas is a technology researcher, maker and open source hardware advocate. Rob van Kranenburg is Founder of Council and Chair of AC04 - IoT Hyper-connected Society of the European Research Cluster on the Internet of Thing. Jelena Mitic is Researcher and R&D project manager @siemens.

Section 4-KPI

In the table below we provide a set of KPIs defining targets for driving evolution of TagItSmart! ecosystem and adoption of project results on the market.

Key Performance Indicator	Target Value	Related Objective(s)
1st year prototype: number of users, FunCodes types demonstrated, deployed FunCodes	**Users: >20** **Number of FCs types: >= 10** **Number of deployed** FunCodes: **>50**	**TO1-4**
2nd year (B2B): number of users, companies, deployed FunCodes	**Users: > 500** **Number of Companies: 2-3** **Number of deployed** FunCodes: **100-500**	**TO1-4**
3rd year (B2B2C): number of users, companies, deployed FunCodes	**Users: > 1500** **Number of Companies: 3-5** **Number of deployed** FunCodes: **> 500**	**TO1-4**
TagItSmart! community: size in Y1	**Size: >300**	**EO1**
TagItSmart! community: size in Y2	**Size: >1000**	**EO1**
TagItSmart! community: size in Y3	**Size: >5000**	**EO1**
Open calls: open calls carried out, number of applications	**Open calls: = 2** **Number of applicants: >50**	**EO1, EO2**
2nd year (B2B): external business stakeholders engaged	**>= 5**	**EO1, EO2**
3rd year (B2B2C): external business stakeholders engaged	**>= 10**	**EO1, EO2**

Table 1: KPIs for TagItSmart! ecosystem development

The result of Y1 has reached the KPI's that were set at the beginning of the project. For broad dissemination including Conferences, see here.[60] In the table are the content specific and context building Ecosystem activities. For specification see the Appendix.
An ecosystem is an amalgamation of interests that remains conflicting and relatively dormant until a clear offering is made. This is foreseen in Y3 (fully active) and Y2 (emerging).

Ecosystem type	Meetings	Number of People	Output
Policy Meeting	3	8	Project Requirements and Context
Open Call Meetings	6	50	Open Call Requirements
IEAB	None so far	10	Commercial uptake
Linkedin Group[61]	no	174	Business Ecosystem building
Twitter	no	205	Media Ecosystem building
Meetups	3	6[62], 54[63], 49[64] = 109	Local Ecosystem building

Section 5-Focus for 2017, Y2.

To reach the KPI for Y2, the following activities are planned.

To **create awareness** of shared potential strategic decision making for stakeholders that are competing on products and services. In *What Stakeholder Theory is Not* Philps, Freeman and Wicks that the term stakeholder is powerful yet means different things to different people. Our ecology is characterized by complex and dynamic environments containing a wide range of stakeholders, from hostile to conciliatory, from obstructive to collaborative [Crocker (2007) and as such it is an open and ongoing environment characterized by change, and real-time combinatorial innovation.

To **build an open developer community** based on standardization through an SDK backed by the partners and (large parts) of their ecosystems, covering the full supply chain including end user recycling.

To **evaluate engagement opportunities** to check the quality of the product and provide that in a conversation back to the customer, see for example the conversation with customers in the home services use case: you have a washing machine, it orders soap or calls maintenance: *personalization as a major incentive for consumers.*

To **create Customer Journeys** for IoT mass market products with the story of products: origins, ingredients, what was happening, how it was transported, how it will be disposed of; e.g. the context of each product. Goods can speak, can this be a Facebook for things?

To **build links to the Responsible Innovation community** to strengthen practical reflection on ethics, privacy and security as unique selling points in a business ecology as actionable enablers alongside technical enablers. RRI seeks new ways to understand these differences and explore their implications as an integral part of the innovation process.

To **explore the notion of smart contracts**. Instead of being dependent on benevolent action from the consumer to dispose of their waste responsibly, the discarded objects could "trade themselves" into a reuse/secondary material platform etc. If a smart contract is (more or less) a contract written in code, must it be implemented on a blockchain, or can it also be implemented in “traditional” IoT systems? For example, if my smart fridge is set to automatically order yoghurt when I take the last one, is that transaction (the order/purchase of new yoghurts) already a smart contract?

To **co-create with partners Flash studies/Questionnaires**: the goal is to engage public, potential users and ecosystem actors and capture feedback and opinions on project outcomes, choices and pilots. The initial questionnaire will be run towards the beginning of Y2 of the project as well as before and after the pilots.

To **assist WP5 user engagement for trials and pilots**, kick-start the exercises for identifying lead users with the specific use cases, and streamline end-user engagement support in two main tasks; facilitating through co-creation productive end-user engagement in the creation of the use cases in the demos and pilots, and facilitating adequate, coherent and consistent stakeholder coordination throughout and especially *after* the project has ended.

Section 6-Appendix

The Innovation and Exploitation Advisory Board (IEAB) is an entity especially designed and introduced in light of the strong commercial and user/consumer-centric nature of the project. Among its objectives are to maintain a strong commercial direction during the whole project and provide direction to the project from experts in the field of user engagement with ICT technology and with strong commercial view, in order to maximize the commercial exploitation of the project deliverables while ensuring protection of the user data and participation to field trials.[65] Role of the T6.4 Exploitation and go to market analysis task leader (SIE) is to organize and regularly co-chair the Innovation and Exploitation Advisory Board.

In this context it is interesting to note that we applied for *EC Common Exploitation Booster services* at the H2020 Common Support Centre, but were not withheld for the program.

Project partners SIE, DNET, RD, PICOM, Leroy Merlin, UNIVEREXPORT.
Partners: Eclipse, La Poste, Microsoft (confirmed), AIOTI, Boulanger, Magush, Carrefour, IIP, Forrester, W3C, Bosch (in progress)
Surrey[66] will be involved with the Internet of Things Meetup in Guildford, as will Ghent[67] and Novi Sad[68].
UPC presented Item Level Control features at Motorway of the seas conferences durin spring/summer 2016 and also in Kvarkenrådet (summer 2016)
UPC has talked with Ministry of transport in Finland aobut transportation and POS-engagement related to UC1, spring 2016.
Donde is talking to Marco Laucelli[69] from Novelti[70] and as they are half-based in Mallorca they are planning to do the Meetup with them in June in Mallorca.
EVRYTHNG is interested in starting and running a periodic "Web of Things" meetup in London. TagItSmart talks will be aligned inside this meet up and it will be used as sponsor. For the Web of Things meetup (https://www.meetup.com/es-ES/webofthings-uk/) a start as made already with one introductory meetup about a book from Dominique Guinard and Vlad Trifa. *EVRYTHNG* joined efforts with W3C who organised a Meetup (https://www.meetup.com/es-ES/meetup-group-OUmudkVz/) which started two weeks ago.
The presentation by RD, March 21 2016 at Strategy Summit Energy[71] led to a follow up invitation to Eindhoven Future Green City[72] 2016 with a *workshop on* TagItSmart and a meeting with the strategic advisors og Jacqueline Cramer, Dutch Ambassaodor for Circular Economy on May 19 in Amsterdam. Report to follow. There was an interesting disruptive startup presented at the Energy Summit. *Sungevity*[73]. In Europe, has teamed up with E.ON, the largest utility in the EU, which is ditching its centralised generation business and focusing on solar, storage and micro-grids. The two companies have announced major initiatives in the German, Dutch and now UK markets.
RD presented TagItSmart ar The Associations RoundTable (ART 2016) @Singapore Expo - conjunction with Trade Event: IoT Asia 2016.) [74] The Associations RoundTable was an opportunity to forge alliances through networking and sharing.
RD gave an expert address on a topic related to the workshop's main theme "Dealing with Social and Economic Challenges to Achieve Green Growth". Invited speakers are Jean-Pierre Lehmann (IMD, Switzerland), Do Hoon Kim (KIET, South Korea), Zhizhong Yao (Institute of World Economics and Politics, China), Hong Song (Chinese Academy of Social Sciences, China), Marco Annunziata (General Electrics, USA), Tony Nash (Delta Economics, Singapore), Mark Purdy (Accenture Institute for High Performance, UK), and Catherine Mulligan (Imperial College London, UK). GES Taipei Workshop April 20, 2016 Venue: Taipei International Convention Center (TICC)
RD participated in "Towards European Leadership in the Industrial Internet", November 29, 2016 at the Representation of the State of Baden-Wurttemberg to the European Union.[75]
RD to participated in roundtable The Internet of Things in the European Ecosystem, Friday November 25th 2016, Télécom ParisTech, 46 rue Barrault, 75013 Paris. What would be the implications of these technologies at the individual and collective level?[76]
TagItSmart will be represented at the Digital Transformation & IOT Towards Circular Economy Conference 19th-20th January, 2017 Amsterdam in a presentation by Ms. Monika Schroeder as

a representative of the EU Commission DG CONNECT and the Horizon 2020 project Tag It Smart.
A blogpost in SmartCitiesWorld *The circular economy gives meaning to IoT & guides apps & services in smart cities shows how* TagItSmart reflects the new EU R&D philosophy to have real impact and build new business models.[77]

[1] http://www.ellenmacarthurfoundation.org/news/circular-economy-would-increase-european-competitiveness-and-deliver-better-societal-outcomes-new-study-reveals

[2] See also: The Flanders Materials Programme (FMP):

- A long term vision: Plan C is the circular economy hub in Flanders, created by OVAM to encourage a change in mind-set from waste to resources and to accelerate the move towards a circular economy
- Policy-relevant scientific research: SuMMa (Policy Research Centre for Sustainable Materials Management) brings together a broad spectrum of researchers and investigates which economic, policy and social conditions need to be fulfilled in order to realise the transition towards a circular economy.
- Actions and projects in the field: Agenda 2020 is a list of 45 concrete projects with active partners and a clear time schedule.

http://www.ellenmacarthurfoundation.org/case-studies/belgium-flanders-materials-programme

[3] http://www.sciencedirect.com/science/article/pii/S0048733311000187

[4] The aim of the Web of Things Community Group (CG) is to accelerate the adoption of Web technologies as a basis for enabling services for the combination of the Internet of Things with rich descriptions of things and the context in which they are used.

[5] See also: Data sharing and analytics drive success with IoT. Creating Business Value With the Internet of Things
September 08, 2016, by: Stephanie Jernigan, Sam Ransbotham, and David Kiron: "We found that obtaining business value using the connections the IoT creates between an organization and its customers, suppliers, and competitors depends on companies' willingness to share data with other organizations."
http://sloanreview.mit.edu/projects/data-sharing-and-analytics-drive-success-with-internet-of-things/?utm_source=twitter&utm_medium=social&utm_campaign=sm-direct

[6] Gerald.Santucci@ec.europa.eu
Monika.SCHROEDER@ec.europa.eu

[7] The first response was very productive and positive. Konstantinos Malandrinos Policy Officer of Municipal Waste Europe and his colleague Clemence Garnier were the only ones so far able to make it on that day, thus we postponed it to October 21.
Kurt Vandenberghe, Director for Directorate Climate action and resource efficiency, Directorate-General for Research and Innovation, European Commission, suggests that we address an invitation to his fellow directors Jack Metthey (in charge of climate action and resource efficiency) and Peter Droell (in charge of industrial technologies) who both are interested in following up on the circular economy.
Peter Fatelnig, Deputy Head of Unit for Net Innovation at European Commission says: "Looks like a super-ambitious project you have at hand here. He is willing to be present at the Stakeholder Meeting after summer. Invitation not received and interest shown on behalf of MEP Pietikäinen. Ms. Kiti Gjerstad Political Assistant, Office of Sirpa Pietikäinen MEP, European Parliament. Invitation received and forwarded to colleagues: "Interesting project, but for the moment I cannot be engaged."
Bernard Barani, Assistant to the Director at European Commission replied and cc'd to Mechthild Rohen, the new head of #IoT.
Gaëlle Colasfrom ACR + an international network of cities and regions who share the aim of promoting smart resource consumption and sustainable management of municipal waste through prevention at source, reuse and recycling, says: "We will however closely follow your project."
Stephane Arditi, Products & Waste Policy Manage, cc's in her reply to four colleagues in the EEB, the largest federation of environmental citizens' organisations in Europe and says:" However the project and the approach seems really promising to us. Use of tags is great for providing traceability possibilities (including compliant waste treatment routes) and information for repair, disassemble, reuse, recycling. It is clear that a more systematic use of them could trigger industrial development and sensor based initial process steps to direct items towards best treatment steps (e.g a clean material could avoid going through decontamination step). We would be interested to know the progress of your project and the outcomes of your investigations, as well as eventual cost/benefit analysis and recommendations.
Konstantinos Malandrinos Policy Officer of Municipal Waste Europe and his colleague Clemence Garnier were the only ones so far able to make it on that day. They have been informed that we postpone the meeting,
In a meeting in Amsterdam City Council on May 19 with Edwin Oskam and Willem Koeman, Strategic advisors, and coordinator Board themes (Advisor Circular Economy Amsterdam) they stated that TagItSmart was very interesting in their circular economy plans. They are interested in hosting a seminar in order to promote the Open Calls.
Hanne Melin, Director Global Public Policy and Head of eBay Inc. Public Policy Lab EMEA, working with NEXA on IoT http://nexa.polito.it/iot, will now be looking at Circular Economy and IoT and wants to collaborate.
Vladimir Gumilar, Director at Construction cluster of Slovenia, after hearing RvK TagItSmart presentation at Bled, 6th Living Bits and Things 2016 June 20th – 21st, 2016, Bled, Slovenia, of ECCA, is interested in collaboration.
http://www.clustercollaboration.eu/escp-profiles/ecca

[8] Communication:
http://eur-lex.europa.eu/resource.html?uri=cellar:8a8ef5e8-99a0-11e5-b3b7-01aa75ed71a1.0012.02/DOC_1&format=PDF
List of actions:
http://eur-lex.europa.eu/resource.html?uri=cellar:8a8ef5e8-99a0-11e5-b3b7-01aa75ed71a1.0012.02/DOC_2&format=PDF

[9] http://ec.europa.eu/environment/circular-economy/index_en.htm

[10] Intelligent assets are a key building block of a system capable of ushering in a new era of growth and development, increasingly decoupled from resource constraints."– Dame Ellen MacArthur, Founder, Ellen MacArthur Foundation

[11] The report was produced by the World Economi Forum and the Ellen MacArthur Foundation as part of Project MainStream, a global, multi-industry initiative that aims to accelerate business-driven innovations to help scale the circular economy. "Digital technologies are driving a profound transformation of our economy. Guiding this wave of change by applying circular economy principles could create value, and generate wider benefits for society, as this report shows. Intelligent assets are a key building block of a system capable of ushering in a new era of growth and development, increasingly decoupled from resource constraints."– Dame Ellen MacArthur, Founder, Ellen MacArthur Foundation. http://www.ellenmacarthurfoundation.org/publications/intelligent-assets

[12] Circular economy meets the IoT, February 11, 2016 in Innovation http://brand-e.biz/economy-goes-circular-as-products-become-smart-and-connected-to-internet-of-things_37126.html

[13] e.g. Project BURBA (Bottom Up selection, collection and management of URBAn waste), funded under FP7-Environment.

[14] RAND (2012) *Smart Trash: study on RFID tags and the recycling industry*.

[15] Notes from TagItSmart! meeting, Brussels (BU25), October 21st, 2016 Participants:
Gérald Santucci, Monika Schroeder (EC), Carsten Wacholz (EEB), Rob van Kranenburg (Tag It Smart, Horizon 2020)
Context: TagItSmart! (Smart Tags Driven Service Platform for Enabling Ecosystems of Connected Objects) is a EU-funded research and innovation project that aims at redefining the way we think of everyday mass-market objects not normally considered as part of an IoT ecosystem[15].

[16] Oct 21 BU 25. Present: Gérald Santucci, Monika Schroeder (EC), Carsten Wacholz (EEB), Rob van Kranenburg (Tag It Smart, Horizon 2020)

[17] Additional information from Magnus Gislev, European Commission. Directorate-General for Internal Market, Industry, Entrepreneurship and SMEs C.2 Resource Efficiency and Raw Materials
The European Innovation Partnership on Raw Materials issued a plan in 2013 comprising the following action:
Critical Raw Materials in product and waste flows: this action should help increase the knowledge on the presence of Critical Raw Materials (CRM) in complex products, so as to improve recycling rates. It would involve encouraging further development and uptake of environmental product declarations (i.e. "type III" declarations as described in ISO 14025, which are primarily intended for use in business-to-business communication) that include bill of material, as well as improving the monitoring of e-waste flows. The PEP ecopassport program (see www.pep-ecopassport.org), covering electrical, electronic and heating & cooling industries, could be a starting point and/or serve as a good model. This action could also be linked to the further refinement of a product environmental footprint methodology (see the Communication from the European Commission on Building the Single Market for Green Products and the Commission Recommendation on the use of the Product Environmental Footprint (PEF)).
This action would also involve making use of advanced ICT technologies to trace materials in products and wastes, to include information required to maximize the recovery of materials and to improve control of waste flows.
Prerequisites for the action are participation of the different actors in the supply chain and the further development of appropriate standards. Implementation would be done based on pilots for specific e-waste streams on a voluntary basis and in respect of confidential business information.
(see https://ec.europa.eu/growth/tools-databases/eip-raw-materials/en/content/strategic-implementation-plan-part-ii)

- 15 of the WEEE Directive:

Information for treatment facilities
1. In order to facilitate the preparation for re-use and the correct and environmentally sound treatment of WEEE, including maintenance, upgrade, refurbishment and recycling, Member States shall take the necessary measures to ensure that producers provide information free of charge about preparation for re-use and treatment in respect of each type of new EEE placed for the first time on the Union market within one year after the equipment is placed on the market. This information shall identify, as far as it is needed by centres which prepare for re-use and treatment and recycling facilities in order to comply with the provisions of this Directive, the different EEE components and materials, as well as the location of dangerous substances and mixtures in EEE. It shall be made available to centres which prepare for re-use and treatment and recycling facilities by producers of EEE in the form of manuals or by means of electronic media (e.g. CD-ROM, online services).
2. In order to enable the date upon which the EEE was placed on the market to be determined unequivocally, Member States shall ensure that a mark on the EEE specifies that the latter was placed on the market after 13 August 2005. Preferably, the European Standard EN 50419 shall be applied for this purpose.
(see http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32012L0019&from=EN)

[18] A useful baseline for reflection could be the 2011 SMART TRASH. Study on RFID tags and the recycling industry – see http://www.rand.org/pubs/technical_reports/TR1283.html and https://ec.europa.eu/digital-single-market/en/blog/a-collective-commitment-to-track-waste-world-premiere-workshop-on-rfid-and-waste

[19] https://www.euractiv.com/section/sustainable-dev/opinion/a-truly-circular-economy-will-massively-reduce-europe-s-climate-impact/

[20] See also: Data sharing and analytics drive success with IoT. Creating Business Value With the Internet of Things
September 08, 2016, by: Stephanie Jernigan, Sam Ransbotham, and David Kiron: "We found that obtaining business value using the connections the IoT creates between an organization and its customers, suppliers, and competitors depends on companies' willingness to share data with other organizations."
http://sloanreview.mit.edu/projects/data-sharing-and-analytics-drive-success-with-internet-of-things/?utm_source=twitter&utm_medium=social&utm_campaign=sm-direct

[21] http://www.euractiv.com/section/sustainable-dev/news/eu-group-says-a-product-passport-would-open-doors-to-eco-innovation/

[22] http://innovation-forum.co.uk/analysis.php?s=product-passports-pros-and-cons

[23] https://aeon.co/essays/innovation-is-overvalued-maintenance-often-matters-more

[24] Hail the maintainers Capitalism excels at innovation but is failing at maintenance, and for most lives it is maintenance that matters more by Lee Vinsel & Andrew Russell https://aeon.co/essays/innovation-is-overvalued-maintenance-often-matters-more

[25] *#ACCELERATE MANIFESTO FOR AN ACCELERATIONIST POLITICS*

*https://syntheticedifice.files.wordpress.com/2013/06/accelerate.pdf See: "*Any transformation of society must involve economic and social experimentation. The Chilean Project Cybersyn is emblematic of this experimental attitude – fusing advanced cybernetic technologies, with sophisticated economic modelling, and a democratic platform instantiated in the technological infrastructure itself."

[26] "In the future, a digital organization will be able to spot and exploit a business moment, which is a specific transient instant that spans multiple channels and ecosystems. It wasn't too long ago that business decision-making typically required methodical research, focus groups and surveys followed by a few rounds of animated discussion among key executives. That model is now getting absolutely nuked. According to a thought-provoking Gartner report, "Digital Business Will Compete and Seek Opportunity in the Span of a Moment," the hallmark of a digital business will be the ability to spot opportunities that could span a matter of just seconds. Gartner refers to this concept as a "business moment" and describes it as "a transient opportunity that is exploited dynamically." (Doing Business in a Digital Moment Samuel Greengard | Posted 05-10-2014) "In the future, the trademark of a digital business will be the ability to spot these opportunities, however fleeting." http://www.cioinsight.com/blogs/are-you-a-digital-cio.html/"

[27] https://www.euractiv.com/section/sustainable-dev/opinion/a-truly-circular-economy-will-massively-reduce-europe-s-climate-impact/

[28] Brian.P.Newby@unilever.com: Rob Van Kranenburg / Delfina Fantini Van Ditmar visit to PS

[29] "The logic reflected in the current technological landscape has implications for the interactions we have of living. In the dominant paradigm, however, human subjectivity is largely missing, or founded in simplistic assumptions without consideration ofusers' perspectives on data, contextual significance, and situated values. How can interacting with these systems be more commensurate [1]? Acknowledging and accounting for the role of users in actively making sense of their own data is key. As discussed in second-order cybernetics, all knowledge is dependent on the observer's involvement [2]. Defined by Heinz von Foerster as "the study of observing systems," second-order cybernetics focuses on the observer as subject, aware of his or her own observing.

[30]http://www.theinternetofthings.eu/eduardo-pinheiro-how-retailers-can-overcome-negative-perceptions-smart-home

[31] 'Data-Facturing' in the Internet of Things — a Shakeup Ahead?
http://www.theinternetofthings.eu/'data-facturing'-internet-things-—-shakeup-ahead

[32] https://www.enevo.com/contact/

[33] *Please find below our to-morrow workshop agenda.*

9 :30 – 9 :45	*Welcome / coffee / presentations / agenda*	*All*
9 :45 – 10 :45	*Business requirements* *(cf. UC5 architecture mapping v1 0.pptx)*	*Régis + Pierre*
10 :45 – 12 :30	*Mockups design and / or adaptation part 1*	*Srdjan + Svjetlana*
12 :30 – 13 :15	*Lunch*	
13 :15 – 14 :00	*Mockups design and / or adaptation part 2*	
14:00 – 14:30	*Leroy Merlin existing IS* *Data availability and exchange requirements*	*Régis + Thibaut*
14 :30 – 14 :40	*Coffee break*	
14:40 – 15:00	*Platforms candidates (RMP, EVT, Azure)* *Testing resources (SILAB, in-house, …)*	*Srdjan + Svjetlana + Pierre*
15:00 – 15:30	*Issues to be addressed through Open calls*	*Rob*
15 :30 – 16 :00	*AP* *Wrap up*	

[34] http://www.ignes.fr

[35] http://www.centrenational-rfid.com

[36]http://www.centrenational-rfid.com/news-the-launch-of-the-rfid-privacy-impact-assessment-s-detail-408-gb-ruid-205.html?numPage=1

[37] http://www.theverge.com/2015/3/30/8309573/amazon-launches-home-services

[38] https://coelition.org

[39] Are QR Codes Dead?
"You should answer those meaningful questions in any promotional material that uses a QR code. Appropriately used, QR codes can call your audience to action on postcards, door hangers, flyers, nature notes and more. Have you thought of using QR codes for downloads? Does your company have a lawn care or pest control page to direct people to download information? How about an order or contact form? Perhaps you've developed a cool app? Offered up in the right way, a QR code is just the thing to make access quick, easy and failsafe."
https://www.realgreen.com/community/our-blog/are-qr-codes-dead

[40] https://www.youtube.com/watch?v=_BOdmcVW9eU

[41] http://preciousplastic.com
[42] http://herehere.co:
[43] https://drive.google.com/file/d/0BwtN_FWbI0RraUhZNk5rZno5VjQ/view
[44] https://coelition.org
[45] http://dondelotiro.com/en/entidades-adheridas/
[46] http://dondelotiro.com/en/sala-prensa/
[47] http://www.recyclenow.com/about-us
[48] https://www.fixmystreet.com/#
[49] When it comes to these partners Donde will be able to assist them with specialized knowledge on materials and good practice in other EU countries.
SIGRE (Spanish association of pharmaceutical manufacturers that collects used medicines):They began a European Project (between the European and all national pharmaceutical associations) and that can affect our Pharma Use Case. They want to control illegal medicines in the EU and also comply with some European regulation. It is a IoT platform that will collect all the information related to medicines put in the market (allowing traceability until it gets to the consumers). It is called ENVO and the information about it is still private. May be it can be a good test for interconnection between platforms.
SIGNUS (Spanish association of car tire manufacturers that collects used tires): They have a big problem related to illegal importation of tires, but the worst thing they are now suffering is related to recycling costs. It seems that manufacturers just pay the recycling of those tires introduced in the market, but not those that come originally with the car. As they have a high ratio of collection (and also European entities like them), they are paying more than they get from manufacturers (the recycling of those introduced by them, but also those that came with the car and those that were illegally imported). They have a big problem related to identify those tires that go into second hand processes, so they cannot track them and assure a good quality (that will affect the security of the car
RECYCLIA (Spanish foundation of electric and electronic devices manufacturers that collects WEE): They are also trying to make traceability of all WEE, mainly in big appliances (they are forced by European Law). They are only controlling all big appliances as they are a easy device where to put a RFID tag or GPS beacon (the European project they did last year is in the dissemination plan). All small devices are out of control and there have been some scandals related to illegal exporting of these WEE. The Spanish government is paying 55% of an IT platform that allows the to do that (it is also private yet). It can be also interesting for the interconnectivity.
AMBILAMP (Spanish association of lighting manufacturers that collects used bulbs and fluorescents): They are also trying to implement a traceability but they do not know how to do it. As all these electronic devices become at some point WEE, they will be subject to track them and avoid illegal exporting and littering.
[50] https://www.w3.org/community/web-nfc/
[51] http://www.vttresearch.com/services/smart-industry/printed-and-hybrid-manufacturing-services
[52]http://www.ifam.fraunhofer.de/en/Bremen/Formgebung_Funktionswerkstoffe/Funktionsstrukturen/Gedruckte_Elektronik.html
[53] http://thinfilm.no
[54] http://ink.eecs.berkeley.edu
[55] http://flextech.org/about-the-flextech-alliance/
[56] http://www.nbmc.org.
[57] https://www.w3.org/community/web-nfc/
[58] http://www.gamingtechlaw.com/2016/10/internet-of-things-state-exception.html
[59] http://iot-epi.eu/challenge-2017/
[60] http://www.tagitsmart.eu/dissemination
[61] https://www.linkedin.com/groups/8486104
[62] https://www.meetup.com/Internet-of-Things-Guildford/events/228198348/
[63] https://www.meetup.com/webofthings-uk/events/234143046/
[64] https://www.meetup.com/This-group-is-part-of-the-sociotal-eu-project/events/236191570/
[65] At the intersection of project partners, organizations already close to TagItSmart! project and concept and new attracted ones. Representatives from both external industrial partners and other strategic organizations will be invited, along with organizations that already showed interest for the project, by means of LOI. Additionally, expert in data protection privacy and security and in user engagement will be invited in order to provide suggestions to the project coordination and management about the dedicated measures to put in place for data exploitation. It is envisioned that such expert will be attracted by the original nature of the project and will volunteer to provide a Privacy Impact Assessment (PIA) to support privacy by design within the project from its early stage
[66] http://www.meetup.com/Internet-of-Things-Guildford/
[67] http://www.meetup.com/Internet-of-Things-Ghent/
[68] http://www.meetup.com/This-group-is-part-of-the-sociotal-eu-project/
[69] https://www.linkedin.com/in/mlaucelli
[70] https://novelti.io/),
[71] http://www.strategiesummits.nl/nl-NL/Strategie-Summit-Energie-Utilities.aspx
[72] http://www.futuregreencity.nl
[73] https://www.sungevity.com
[74]

1	Singapore Industrial Automation Association (SIAA) – HOST
2	AllThingsConnected (ATC) Alliance (for IoT Meetup Singapore)
3	Asia Pacific Assistive, Rehabilitative & Therapeutic Technologies Network (APac ARTT-network)
4	Association of Electronic Industries Singapore (AEIS)
5	Association of the Telecommunications Industry of Singapore (ATiS)
6	GS1 Singapore
7	Internet Society (Singapore Chapter)

8	Singapore Electronics, Technology & Industry Organisation (SETIO)
9	Singapore Infocomm Technology Federation (SiTF)
10	Singapore Institute of Materials Management (SIMM)
11	Singapore Manufacturers Consortium (SIMCO)
12	Singapore Productivity Centre (SGPC)
13	Singapore Semiconductor Industry Association (SSIA)
14	Singapore Water Association (SWA)
15	The IoT Council
16	The Japan Electrical Manufacturers' Association (JEMA)

[75] Confirmed speakers include:
http://eu-ems.com/summary.asp?event_id=3310&page_id=7942
Günther Oettinger, Digital Economy & Society, European Commission
Bernd Leukert, Member of the Executive Board, SAP SE
Hans-Jörg Stotz, Senior Vice President, SAP
Emmanuel Routier, Head IoT Development, Orange
Pedro Martinez Cid, Deputy Innovation Director, Iberdrola
Egbert Jan Sol, Field Labs Smart Industry, Netherlands
Max Lemke, European Commission
Markus Heß, Deputy Director General, Federal Ministry of Economic Affairs and Energy
Benjamin Gallezot, Deputy Director General, Ministère de L'Économie de l'Industrie et du Numérique, France
Robert MacDougall, Vodafone, Chairman AIOTI WG Policy Issues
Dr. Hans-Jürgen Schlinkert, Thyssenkrupp, Chairman Legal Framework Conditions, Plattform Industrie 4.0, Germany
Rob van Kranenburg, Chair AC04 – IoT Hyper-connected Society at the European Research Cluster on the Internet of Things
[76]https://cvpip.wp.mines-telecom.fr/2016/10/21/the-internet-of-things-in-the-european-ecosystem/
[77] Launched in May 2016, SmartCitiesWorld is a dynamic website providing the professionals users with a centralised source of intelligence about the infrastructure required to create a smart city today and for the future. Opinions05 Jul 2016 https://smartcitiesworld.net/about/about-us