



Welcoming the digital as a new agora

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Picture the current situation: a table full of delicacies, linen as white as snow, beautiful cutlery; you've invited your friends to dinner. Everyone is happy and deep in conversation. All realise, however, that nothing on that table is yours. You only (still) own the house in which you throw the party. GAFA: Google, Apple, Facebook and Amazon, and BAT: Baidu, Alibaba and Tencent, play on that table and they get richer every minute from our very own feedback. They build new services on top of that. You realise that at some point soon they will take over your house. They already offer to pay the rent of the patio, and do you really need the attic? You are in an uphill battle. You have no tools to fight off the invaders as you are only now, when it is too late, beginning to realise these friends you have invited are taking reality itself, what is "normal" to another level. And as the peasants learned how to tumble the knights from their horses, the world was never the same again.

Our current conceptual toolbox is no longer equipped to address new challenges: “We grasp reality through concepts. When reality changes too quickly and dramatically, as it is happening nowadays because of ICTs, we are conceptually wrong-footed.” (Gligoric et al., 2017)

Goods, persons, houses, situations,¹ and industrial processes radiate data trails and create digital twins. These twins exist as sets of properties in an analytic layer that is in many hands at the moment, but not really under multi-stakeholder control. Whoever or whatever gains agency in and on that layer (which defines governance of the everyday) must grasp the practice and theory of assigning, withdrawing, validating, and defining the entitlements and their very nature: who/what exists when/where/how and why? The term “entitlements” is vague but it points to the fact that “identity” as a term to designate actions, attributes and location of a person has become problematic. Andrea Servida, “father” of eIDAS (Electronic Identification and Trust Services), for example uses it in the following way (Servida, 2019): “where eIDAS matters; data-minimisation; use of trusted attributes, credentials and entitlements (such as age verification, proof of residence, etc.)”

The situation is hybrid in the sense that digital twins actually begin to influence back in analogue objects. This is the moment of ontological change, decisive for leadership in the 21st century. It demands a new toolset for the notion of identity itself. Uncoupling identity in thinking of “entitlements” opens up a new field of value and services. In the case of self-driving cars, for instance, this way of thinking could argue for liability resting not with real person-identities but with entitlements – any combination of a particular driver (with particular points on a passport and certain characteristics) and a particular car. This reasoning can be extended to any service in the network.

1 The public review of Classification of Everyday Living Version 1.0 CSPRD03, announced in <https://lists.oasis-open.org/archives/coel-comment/201805/msg00000.html>, closed on 23 May 2018. No comments were received.

Goods, persons, houses, situations, and industrial processes all radiate data trails and create digital twins. These twins exist as sets of properties in an analytic layer that is in many hands at the moment but not really under multi-stakeholder control.

There is a simple reason for this emancipation and agency: Internet. Psychologists specialising in the behaviour of larger groups of people try to explain the relative ease with which one is able to exert influence over masses by assuming “a causal force which bears on every member of an aggregate, and also for each individual there is a large number of idiosyncratic causes” (Stinchcombe, 1968, p. 67-68). He continues: “Now let us suppose that the idiosyncratic forces that we do not understand are four times as large as the systematic forces that we do understand.... As the size of the population increases from 1 to 100, the influence of the unknown individual idiosyncratic behavior decreases from four times as large as the known part to four tenths as large as the known part. As we go to an aggregate of a million, even if we understand only the systematic one-fifth individual behavior as assumed in the table, the part we do not understand of the aggregate behavior decreases to less than 1 percent (0.004).”

This shows how top-down power works and why scaling itself has become such an important indicator in such a system of “success”. Imagine you want to start a project or “do something” with your friends or neighbours, say five people. This means to take into account before you do anything – state a goal, negotiate deliverables, or even the first date on which to meet for a kick-off – that all five people are impacted by huge idiosyncrasies and generic forces that have to be aligned or overcome before you can even say hello. This shows how difficult it is to “start something”. It also explains why you are always urged to “get bigger” and why you need to “grow”. It is only then *and through the process of getting bigger itself* that the management tools can operate, lying in waiting for you to discover them. To be decisive, to make a difference, to set about a course for change, is in no need of growth, nor of scaling.

Understanding the nature of these social relations in the above terms shows how difficult it is to script moments of systemic change, as hierarchical systems – due to the very fact that they are top down – are able to maintain the status quo with relatively little effort. That which they cannot predict or control are still dissident, strange, or abnormal lone voices, or “sudden events”. With the Internet such elements have been assembling and intensifying, and the Internet of Things will only help reinforce the trend, bringing individuals the sensor network data sets they can handle on their devices. This acceleration of weak signals into clusters, organised networks, and flukes cannot be managed anymore by formats that are informed by and that inform systemic forces as *the nature of these forces has changed*.

Authorities can never again talk at people. They must develop policies in conversation with people and re-negotiate on equal footing the balance between accountability and anonymity and entitlement versus identity.

China, India, and now Russia² have already made this a priority and have taken to centrally coordinate the design of the future online/offline architecture as it will apply to their territory and population.

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The hegemony that used to enable authorities to facilitate the continuity of peace is at its breaking point. Political populism, lack of digital agency, lack of aligning techno-reality in any kind of domain and service with its full absence at the most important decision-making level: the political

model of voting representatives organised in the party format (paid to be an organisational form by the same state structures) once every four years, lack of long term visions on jobs vs robots, lack of education on generational issues of having grown up in commercial connectivity, the erosion of trust in the current financial toolsets versus strong moves towards and adoption of central authority-less crypto-currencies, further regionalisation (Brexit, Catalonia, Poland, Hungary) – they all point to immanent breakdown of the current economic, social and political toolsets.

I posit a living ecosystem of the best possible balance between extreme centralisation (of infrastructure, protocols, and identity management) and extreme decentralisation (of data, applications, services), focussing on resilience and self-healing properties as radically new concrete functionalities of a digital ambient infrastructure, and legible interfaces to those properties that matter for citizens – stability, solidarity, reciprocity, fairness – in an inclusive sustainable environment.

In general and popular imagination there is no available alternative to the real-world situation: Google, Amazon, Facebook, Apple (GAFA) have won the winner-takes-all paradigm and seem to be eternal. With Libra³, Facebook is set to fulfil the killer retail application of IoT: full dynamic pricing on any good, any service, any human want or need. The Facebook whitepaper on LIBRA (May 2019) specifies under The Libra Association purposes: “An additional goal of the association is to develop and promote an open identity standard. We believe that decentralized and portable digital identity is a prerequisite to financial inclusion and competition” (Libra Association Members, 2019).

There are too many dependencies to real-world violence and discrimination in the current governments to fully back nationalisation of all data

² “As reported by Russia’s TASS news agency on Wednesday, ‘Russian President Vladimir Putin has signed the law on providing stable operation of the Russian Internet (Runet) in case it is disconnected from the global infrastructure of the World Wide Web.’” (Doffman, 2019).

³ Interestingly our proposal involving the Zenroom protocol was engendered in the same EU project DECODE from which Facebook “acqui-hired” the UCL team from to build LIBRA, basically validating the commercial impact of the protocols.

assets or run a Chinese form of platform politics that integrates the industrial Internet, sharing clouds across value chains and aligning that with the Honest Shanghai app that pulls data from over 300 databases scoring citizens on trust and thus credit rates.

In between the commercial model of the US data lakes and the fully integrated top-down Chinese approach, Europe should find *a new balance with new leading actors* between centralisation and decentralisation, anonymity and accountability, and investments in innovation and maintenance and repair.

We are in a new conceptual space and should co-create notions of solidarity (economics), privacy (self), security (trust), assets (potentials), risks (resilience), and threats (competition), tailored to a reality of today.

The most important feature of this approach is that identity becomes an activity dispersed over and managed by the person and his or her attributes profile, the object, machine, or robot that performs the service, and the enabling connectivity harnessed in an architecture.

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Accountability over anonymity characterises this approach as it underlies society in the 21st century itself. Tokenised trust is a key feature but only in the actual locality where face-to-face interaction can occur and communities of people work and live together.

This approach that builds reciprocity not over two, but three actors, is the only way to counter and overcome the incongruities that are currently eroding trust: fake news, synthetic data (information artificially manufactured, created algorithmically), fake passports and passports for sale by national source signers.

This approach builds on the fixed identities of human beings in nationally signed passports, of goods in GS1 type of repositories (and scenarios of behaviour in taxonomies such as coelition.org and face and gait recognition capabilities) and reorganises them as “event” identities.

In the Technical Report entitled *Self-Sovereign Identity: A Comparison of IRMA and Sovrin* (Nauta, Joosten, 2019), authors state “Over a decade ago, Kim Cameron and others dreamed of what was called an Internet Identity Layer; it would do for (the exchange of) (identity) data what IPv4 had done for network transport: make sure that all local solutions could live together to form a globally connected infrastructure. could be exchanged throughout the world in the same way. (...) Today, we see tens if not hundreds of initiatives that work with these principles. However, it is still quite difficult to satisfy all of them: surveyed some 50 of them, and identified the three that came closest: uPort, IRMA and Sovrin.”

Identity is thus distributed over architecture, service, and phone, signed in digital signatures, federated and attribute-based only. A large number of technical (IoT), financial (blockchain) and semantic (AI) experts see the need to move from the present fixed-identity paradigms to more flexible or fluid frameworks of “entitlements”, to allow the formulation of context-specific and attribute-based identities. Let’s focus on that vision and build a new smart social contract. It will bring hope and hope is what drives real change and society forward. Technically it can be operationalised in a fully open-source hardware and software environment. The hardware part needs to be procured from the EU industry. The operating system, zenroom,⁴ is being developed in the EU project DECODE.⁵ It forms the heart, a virtual machine running embedded in a chip in the triangle: device (EU passport), embedded SIM cards in services (wearables, home, connected car, and smart city), and infrastructure (routers, 5G base stations).

4 <https://zenroom.org> – Dyne.org also is the content partner in the EU Blockchain NGI RIA LEDGER.

5 <https://decodeproject.eu>

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We thus need an inclusive identity framework that is able to name, validate, and build services on identities that will become a process between a device/controller of some kind (now smartphone), services (energy, mobility...) and the architecture.

That capability should be European.

It does three things:

- it gradually fades out GAFA;
- it creates European services through EU-unified protocols that could be locally permission-less deployed, thus winning us the third battle – after losing data and platform we cannot afford to lose “meaning” (AI running off and on Big Data), as we don’t care where the “original” data resides;
- it restores European dignity, a vital belief in our agency to build meaningful and value creating infrastructures, which is what leaders should do.

I received an invitation to talk about the Internet of Things from the GFF and the Italian Intelligence community, Transformational Technologies #4: Implications for an Expanding Threat Environment September 17-18, 2012 Rome, Italy. In the afternoon, five breakout groups (senior intelligence, police, and military) came back with five scenarios of major threats: one was military, two were about DIY bio-weapons and two were about the “total breakdown of society” because of the inability of current institutions to deal with the digital (Van Kranenburg, 2012). This was 7 (seven!) years ago.

Explaining the current drivers of the Digital Transition to a lay audience is difficult even if the effects are visible and present in everyday life: fake news, depression among youngsters,

addiction to social media, sexting, and on a more economic scale, fear of job loss because of robotic automation, lack of systematic and technical agency on a political level (fining innovative companies or legally trying to regulate data protection, GDPR).

We lack positive stories and examples. We also miss out on formats that reach young audiences like Instagram and YouTube. In China citizens “are beginning to push back against some kinds of surveillance. An Internet company that streamed closed-circuit TV footage online shut down those broadcasts after a public outcry. The city of Shanghai recently issued regulations to allow people to dispute incorrect information used to compile social-credit records. ‘There are rising demands for privacy from Chinese Internet users,’ says Sammy Sacks, a senior fellow in the Technology Policy Program at CSIS in New York. ‘It’s not quite the free-for-all that it’s made out to be’” (Larson, 2018).

Like China that has a strong business-policy coherence, GAFA⁶ and the pre-bitcoin payment industry in the US is also closely aligning itself with traditional Chamber of Commerce activities to lobby against local data storage laws. US technology giants intensify lobbying efforts against stringent Indian data localisation requirements⁷ “which they say will undermine their growth ambitions in India”, sources told Reuters. Technology firms worry the mandate would hurt their planned investments by raising costs related to setting up new local data centres.

What I propose runs counter to the grain of thought and praxis in current western political frameworks and mental imageries. It is not relevant to *also* have a technical agenda, the full agenda has to be techno-political. A concrete action plan and our third step (after GDPR and Digital Signatures, see further) is to quickly regain agency over data, platforms, and the AI value layer.

⁶ Google, Amazon, Facebook, Apple.

⁷ <https://www.reuters.com/article/us-india-data-localisation-exclusive/exclusive-india-panel-wants-localization-of-cloud-storage-data-in-possible-blow-to-big-tech-firms-idUSKBN1KP08J>

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Roadmap

In the workplan of the Next Generation Internet CSA NGI FORWARD we propose a concrete three-step process to build a vibrant, inclusive, democratic Internet ecosystem by 2025.

The first step is being taken: regulating data in GDPR.

The second is regulating digital signatures for persons, which has been achieved (2014 EU eIDAS Regulation).

Future Internet services composition we propose to develop on the basis of digital signatures to be achieved in Taskforce Services (TS), and resilient architectures to be achieved in digital signatures in Taskforce Infrastructures (TI).

Digital Signatures for services (banking, payment, energy, education, care, mobility, connectivity...) and Digital Signatures for architectures (virtual and analogue enablers of connectivity) are a tool to complement current actions on procurement and local agency, as in this kind of Service Level Agreements it does not matter that the original data sets and analytical platforms are not under your control. In this manner local stakeholders are a priority part of building the next layer of value, namely the new entities that are formed when AI-inspired intelligence starts to see patterns unrecognisable before.

The third step is to embed signatures for persons, services, and architectures into a sustainable framework for access and identity. This could be brokered by:

- substituting the passport for a device (a successor to the Estonian e-card) which talks to friendly servers, platforms, and clouds running public algorithms and ethical AI, enabling

direct democracy through local referenda and embedding contributions from taxpayers in a rich value layer that foster innovative public and private services in a comprehensive sovereign framework;

- adding security, framework and architectural checks for any device when it receives the electrical appliance label that is mandatory in Europe for any device as the instance to validate compliance with zenroom;
- produce a European router (dowse.eu) running zenroom;
- new notions of search and new notions of discovery are needed in real-time hybrid environments; Pearse O'Donohue explained these terms in the 2019 Future Internet Conference in Brussels⁸ as follows: 1. We are in seamless connectivity 2. We face instant reprogrammable software defined networks that are with 5G not reprogramming system rules only but going straight into instantly adjustable applications in verticals (also or mostly through networked slicing in 5G).

We are experiencing the last potential zone of transition with humans in agency. The current policy situation requires the convergence of immediate (re)cognition of real-time reputation scores of people and their skills, machines and services

⁸ Opening Session: Rethinking the future of the Internet – Objectives, priorities, opportunities. The possibilities that digital technologies now offer up seem truly limitless and are at the core of Europe's socio-economic growth. A number of threats have however emerged in our increasingly connected digital world – from personal data misuse, digital exclusion, fear of job losses, to fake news – having had negative impacts on the uptake of innovative technologies and services. Looking ahead, it is therefore vital that future developments around the Internet and its governance enhance its role as a key driver for innovation, economic growth, inclusiveness and social progress. Moderator: Rob Van Kranenburg, Founder, Council. Panellists: Pearse O'Donohue, Director, Future Networks, DG CONNECT, European Commission; Maria Rautavirta, Director, Data Business Unit at Data Department, Ministry of Transport and Communications, Finland; Elena Plexida, Vice President, Government and IGO Engagement, Internet Corporation for Assigned Names and Numbers.

and infrastructure repairability.⁹ In moments of crises the readiness of all relevant actors is immediately visible. Only then can planning begin on the basis of the actual level of response.

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We want to investigate embedding these signatures for persons, services, and architectures into a sustainable framework for conflict management that also includes social media, big data, pattern recognition, AI. With disasters come conflict. In *The Social Order of a Frontier Community*, Don Harrison Doyle writes there is a danger to equate conflict with social disorganisation. Jason Dykstra states social conflict is normal, inevitable, and a format for community decision-making (Doyle, 1983). Sociologist Lewis Coser advises that, instead of viewing conflict as a disruptive event signifying disorganisation, “we should appreciate it as a positive process by which members of a community ally with one another, identify common values and interests, and organize to contest power with competing groups” (Doyle, 1983).

The most challenging task will be to develop a common language and vocabulary that puts us on a par with machines that are able to learn, becoming more like equal partners in a relationship.

⁹ People are a set of properties and radiate data. Goods are a set of properties and radiate data. Machines and smart objects like lantern-poles are a set of properties and radiate data. At some point these data sets are mixed in order to address specific situations or provide shortcuts to services. For example: In a car accident with an autonomous self-driving car all the involved entities (from the driver to the tree to the rock to the water in which the car crashes) are awarded temporary identities in order to determine liability, accountability, and damages. The question then becomes: Who awards the identities? What organisation? These temporary identities will build new services.

There is a strong tendency to also want to control data and information on top of owning media production capabilities. There is no need for this. We can envisage “locality” as a centralised protocol of coherent actions that can be executed in a full decentralised way. We move away from democracy as we know it to a new political democratic system that is tuned to the reality of what is happening in every domain of human activity; to live together and alongside real-time data streams of sensor input, to bring big data and analytics into the heart of decision-making and to eventually run territory (not “country”) as a service for all.

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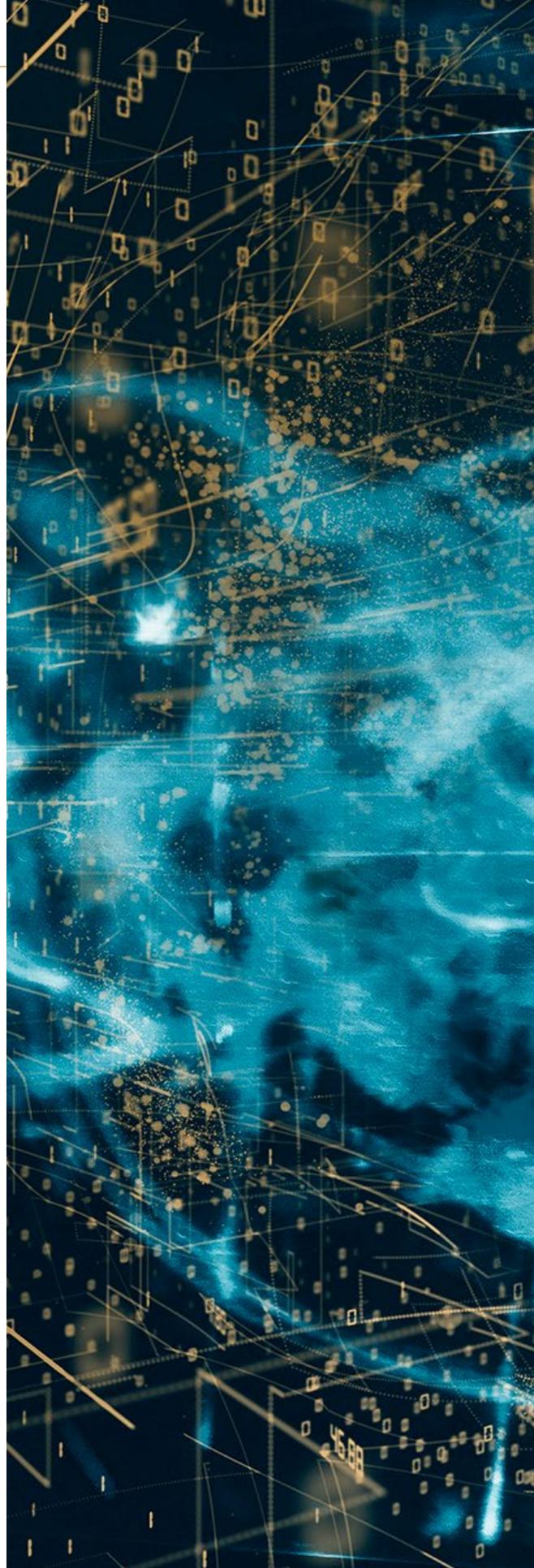
It takes a strong mental effort to realise that it is your own situation, *the very model that supports you*, that needs changing instead of a hypothetical situation thought of as more suitable. Even more difficult is to realise that it is possible to build similar pragmatic cybernetics and to start working towards that with like-minded people. A successful Digital Transition is the best possible feedback on our physical and mental health, the best possible deal based on real-time resource allocation monitoring, the best possible decision-making based on real-time data and information from open sources, and the best possible alignment of local providers with the global potential of wider communities.

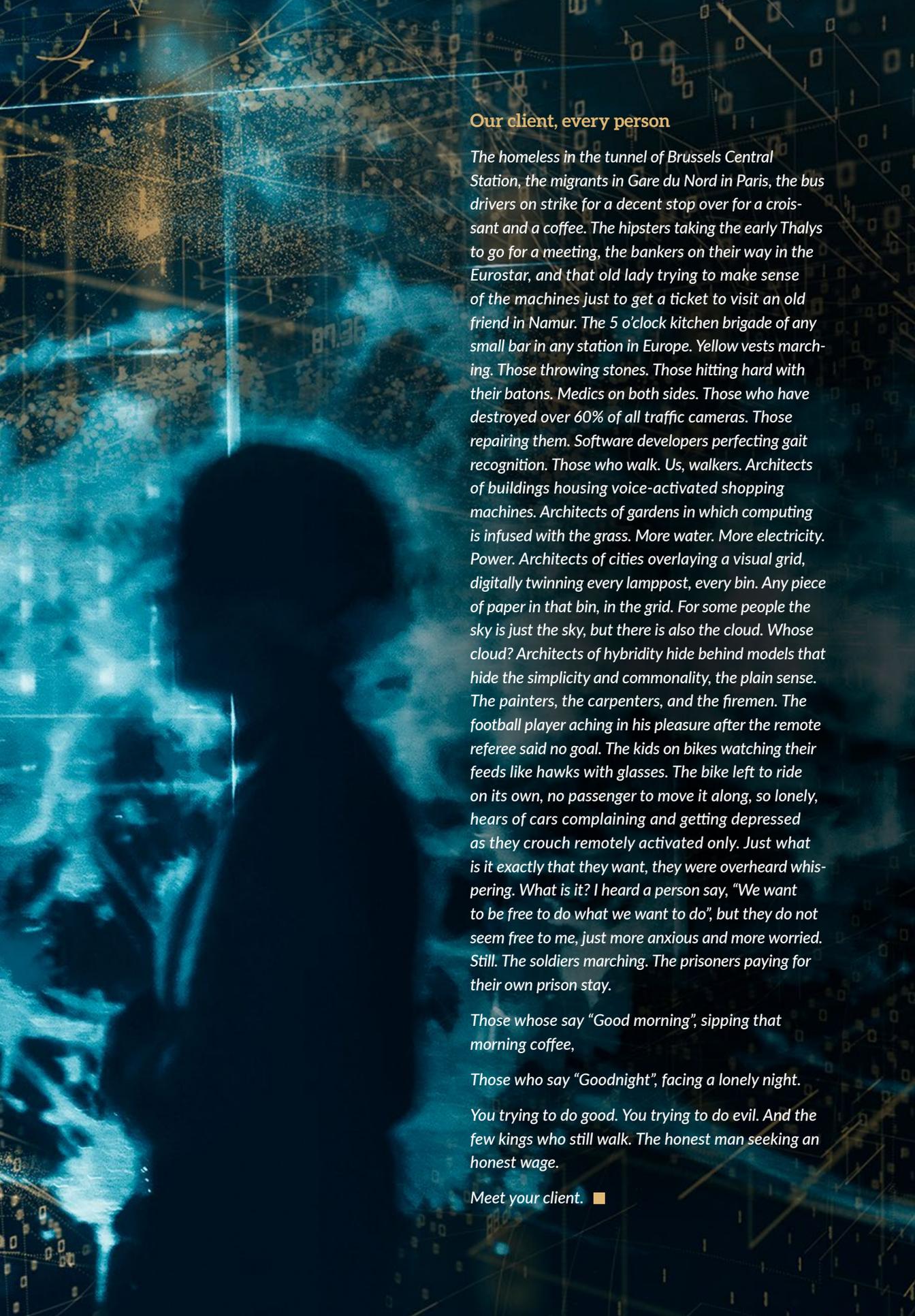
The journey we have to undertake resembles that of people going into exile. For “people” read our particular kind of embodied intelligence. It has a tremendous idiosyncratic variety; we are all different and unique, yet we also share characteristics that make us part of the human species. Foresight and planning as part of collective decision-making have been until now solely our domain. As we see another kind of foresight intelligence (that we call artificial) evolving and working in the key players as regards everyday (leisure)

activities and mundane tasks (Airbnb, Amazon Prime, Uber), in distinct domains (BAN: wearables/health, LAN: smart homes/retail, WAN: connected and electric car, mobility in general, planning patterns, and VWAN: the smart city and large grids), and in horizontal services such as fintech and ICOs (which compete and co-evolve with traditional financial tools), it is only a matter of time before AI works its way into public decision-making on a large scale. We have to prepare for this situation.

History has seen many botched revolutions and would-be patches to bring political reality in line with mental models, new business patterns, and emancipatory trajectories of individual human beings.

One of the most interesting and relevant in the current crypto-craze context is the 1825 Decembrist uprising against feudal Russia. It was not planned well. The officers had fought to free France alongside their French officers, only to return to see the soldiers they fought and died with go back into serfdom. It was more of a romantic than strategic uprising. The czar found it hard to hang them, so he sent them to Siberia. And as they went they formed *artely*, artels, just like any other convoy before them had. In these *artely* the convicts grouped together through all kinds of *self-organised smart contracts*. It was possible to change name (and punishment), to buy and sell goods, comfort, and protection. The *artely* leaders made deals with the wardens and officials. They were in chains in the cities and villages. In the open fields, as they marched, they took them off. It is well-documented that prisoners who escaped during such a deal were flogged harsher and longer by their fellow inmates than the officials. After all, they had broken not just the social contract with the state but with their own “family”. This betrayal is always worse. This tactical leadership – temporary smart contracts – after coming together in *artely* is what we have to do along every stretch of the journey from here to the world as an integrated zone of operation. Against the grain at times, against our very own wishes, simply chained together in the belief that breakdown of the current and early integrators is far worse.





Our client, every person

The homeless in the tunnel of Brussels Central Station, the migrants in Gare du Nord in Paris, the bus drivers on strike for a decent stop over for a croissant and a coffee. The hipsters taking the early Thalys to go for a meeting, the bankers on their way in the Eurostar, and that old lady trying to make sense of the machines just to get a ticket to visit an old friend in Namur. The 5 o'clock kitchen brigade of any small bar in any station in Europe. Yellow vests marching. Those throwing stones. Those hitting hard with their batons. Medics on both sides. Those who have destroyed over 60% of all traffic cameras. Those repairing them. Software developers perfecting gait recognition. Those who walk. Us, walkers. Architects of buildings housing voice-activated shopping machines. Architects of gardens in which computing is infused with the grass. More water. More electricity. Power. Architects of cities overlaying a visual grid, digitally twinning every lamppost, every bin. Any piece of paper in that bin, in the grid. For some people the sky is just the sky, but there is also the cloud. Whose cloud? Architects of hybridity hide behind models that hide the simplicity and commonality, the plain sense. The painters, the carpenters, and the firemen. The football player aching in his pleasure after the remote referee said no goal. The kids on bikes watching their feeds like hawks with glasses. The bike left to ride on its own, no passenger to move it along, so lonely, hears of cars complaining and getting depressed as they crouch remotely activated only. Just what is it exactly that they want, they were overheard whispering. What is it? I heard a person say, "We want to be free to do what we want to do", but they do not seem free to me, just more anxious and more worried. Still. The soldiers marching. The prisoners paying for their own prison stay.

Those whose say "Good morning", sipping that morning coffee,

Those who say "Goodnight", facing a lonely night.

You trying to do good. You trying to do evil. And the few kings who still walk. The honest man seeking an honest wage.

Meet your client. ■

About the author:



Rob van Kranenburg is the Founder of Council IoT and #iotday. He wrote *The Internet of Things*. A critique of ambient technology and the all-seeing network of RFID, Network Notebooks O2, Institute of Network Cultures. Together with Christian Nold he published *Situated Technologies Pamphlets 8: The Internet of People for a Post-Oil World*. Rob is co-editor of *Enabling Things to Talk: Designing IoT solutions with the IoT Architectural Reference Model*, Springer Open Access. He works as Ecosystem Manager for the EU project Next Generation Internet, Strategy CSA NGI FORWARD. He is a DeTao Master IoT.

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