PANEL ON NEW TRENDS ON CITIZEN-ORIENTED SERVICES

Moderator

Korosh Vatanparvar, *Samsung Research America, Digital Health Lab, USA*

Session 17:00 – 19:45

PANEL ON NEW TRENDS ON CITIZEN-ORIENTED SERVICES

Konstantinos Kotis, *University of the Aegean, Intelligent Systems Lab, Lesvos, Greece*

Automating Trustful IoT Entities for Deployment in Connected Cities

Evgeniy Krastev, *Sofia University St. Kliment Ohridsky, Bulgaria*

Implementation Challenges of a Standard International Patient Summary across EU

Paul Fortier, *University Of Massachusetts Dartmouth, USA*

Challenges and Societal Impacts of Citizen-Oriented Services

KONSTANTINOS KOTIS

- Air pollution monitoring using distributed senor nodes

- Semantics to model and enable communication between heterogeneous IoT nodes

- Match making and voting between nodes for trusted data monitoring

EVGENIY KRASTEV

- Standardization of health data transmission between health providers in EU

- Provide a framework to convert and match data types of patient summary

- Regulations to help with standardization of patient summary in EU

PAUL FORTIER

- Challenges in health-care (nursing) decision making

- Infrastructure to implement citizen-oriented services

- Utilizing sensors to monitor health of honey bees and plants

PANEL SUMMARY

- Standards are necessary to enable and regulate citizen-oriented services

- Scalable and interoperable infrastructure is needed to achieve

- Ease of use is a critical component to fast deployment of services

- Services should help and take burden off of citizens

IARIA NexTech 2019

Panel

New Trends on Citizen-oriented Services

Paul Fortier

Professor of Electrical and Computer Engineering

University of Massachusetts Dartmouth

College of Engineering: Electrical and Computer Engineering Department

What's a Definition For Citizen Oriented Services?

- Services to support citizen / Government interaction

- On-Line services aimed at improving citizen service experience (e.g. no lines for new drivers license)

- Driven by increase in Geo oriented data, IoT generated data, citizen generated data

- Increase automation to reduce costs (to government) while improving citizen experience
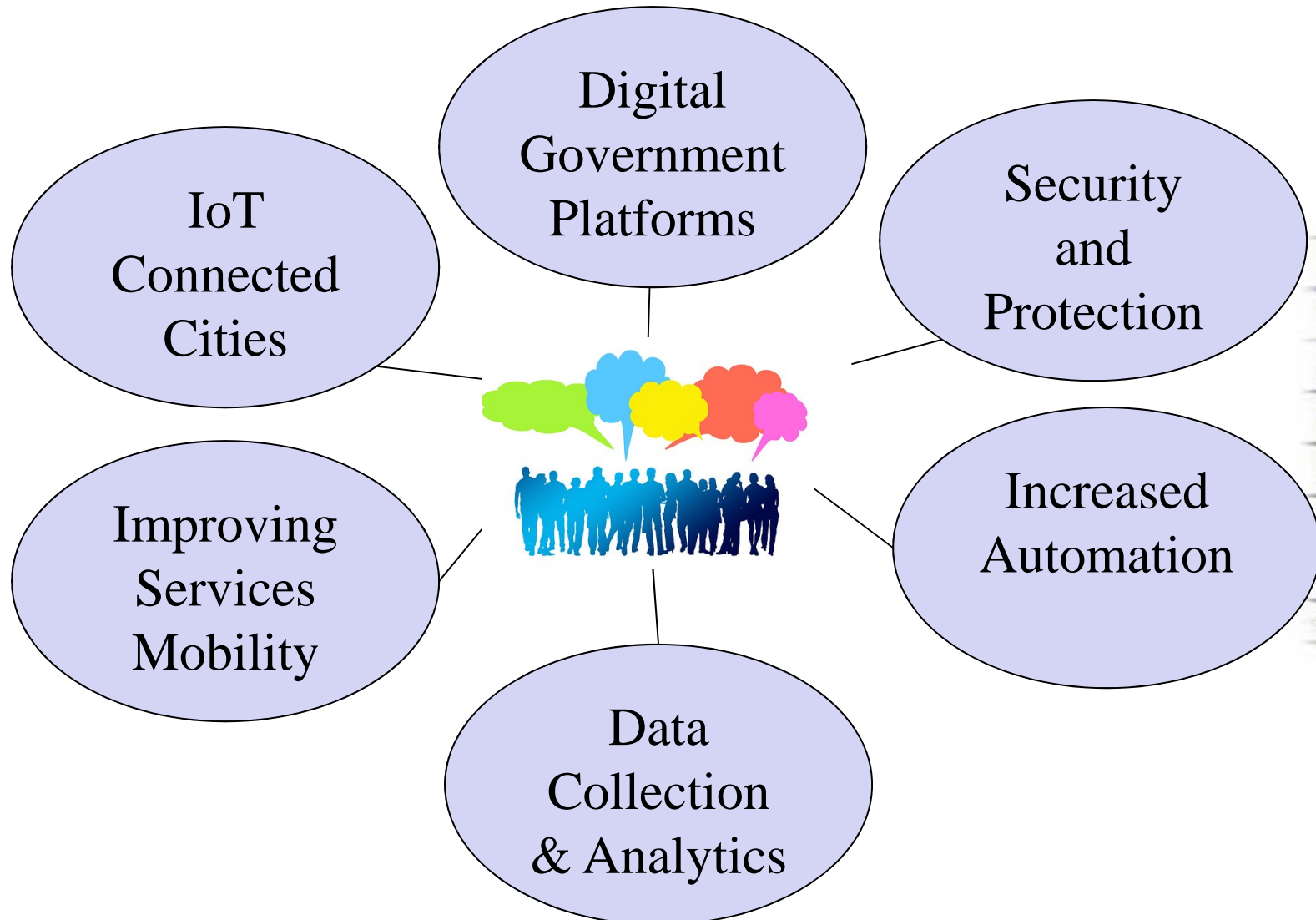
Range of Citizen Oriented Services

- Public safety, emergency management

- Health, social and human services

- Commerce, labor and taxation

- Energy, environment, natural resources, parks and agriculture

- Citizen engagement, open government, online service delivery

- ????

Transformative Trends

IoT Connected Cities

Digital Government Platforms

Security and Protection

Improving Services Mobility

Increased Automation

Data Collection & Analytics

Evolution of Citizen Engagement

- Citizens as customers

- Mobility of Government services

- Connecting Citizens, government and IoT

- Engaging Citizens with open data

- Security for citizen engagement

Issues with Citizen Oriented Services

- Quality of services

- Range of available services

- Level of Citizen participation

- Who controls system

- Services Trust

- $$$

Possible Benifits

- Supports data driven decisions (all sides)

- Provides citizens access (transparency) to government information

- Supports reaching anyone at anytime from anywhere

- Fosters sustainable collaborations and partnerships amongst constituents

- Fosters sustainable technology environment for all

Enabled by Trends

- Public Information visually available
- Public information push out to citizens (tailored / Aggregated)
- Citizen inputs / comments (solicited / unsolicited)
- Citizens as sensors
- Citizen as scientist
- Service tailoring for the individual (e.g. volunteerism)

What Does the Future Hold?

- Seamless integration of all data from all sources including IoT
- Application of AI technologies to aid forecasting and push out of useful information to citizens
- Citizens as integral components of Government services
- Citizens as members of a diverse research team
- Citizens as mobile source of real-time reporting of events, etc.

Automating trustful IoT entities' deployment in Connected Cities

Panel: New Trends in Citizen-oriented Services

The Thirteenth International Conference on Mobile Ubiquitous Computing, Systems, Services and Technologies (UBICOMM 2019)

September 25, 2019

Porto, Portugal

https://www.iaria.org/conferences2019/UBICOMM19.html

Konstantinos Kotis

UNIVERSITY OF THE AEGEAN

Trends on Citizen-oriented Services

- Google Search

Top 6 Digital Transformation Trends In Government - Forbes

https://www.forbes.com › sites › danielnewman › 2017/06/29 › top-6-digit... ▾

Jun 29, 2017 - Here are the top digital transformation **trends** for government. ... **Citizen-oriented** apps aim to deliver public **services** as well as engage the ...

Images for Trends on Citizen-oriented Services

→ More images for Trends on Citizen-oriented Services   Report images

Top 6 Digital Transformation Trends In Government

Daniel Newman Contributor ⓘ
CMO Network
I explore all things Digital Transformation.

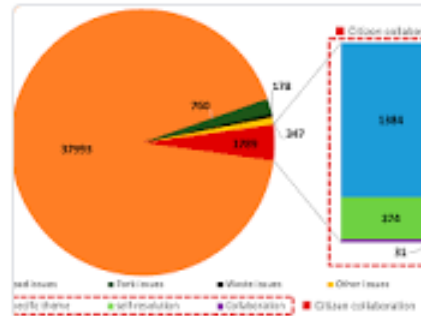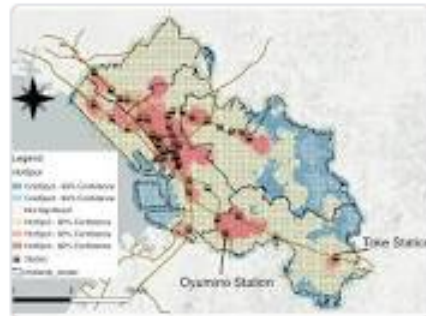### 1. IoT Connected Cities

With the use of (built-in) sensors in cars, street lights, traffic cameras and electricity grids, data and information are automatically collected and distributed.

Some uses for IoT are:
- Smart parking/meters that "talk"
- Road sensors track and manage traffic patterns
- City sensors to measure pollution...

2

Connected City example

IoT Application: Air Pollution detection smart app (running on Alice's smart phone)

IoT Devices: sensor devices measuring levels of carbon dioxide (CO_2), PM10 particles, etc.

City Network: air pollution awareness social network (Alice's phone is a connected node)

**Goal:** avoid stepping into high air pollution areas for health reasons

✓ Alice use her smartphone/app to request a connection to sensor devices in an area she is about to drive into

✓ Several IoT devices will respond to this request, so there is a need to make a decision on which sensing results to consider

✓ She configures her app to accept results only from n=5 most "trustworthy" sensors, following a trust-weighted majority voting result (... each YES or NO recommendation is counted as 1, weighted by Alice's trust toward the recommender)

✓ If the total trust-weighted "YES" score is higher than the total trust-weighted "NO" score, Alice will step into the area.

Ing-Ray Chen, Fenye Bao ; Jia Guo. **Trust-based Service Management for Social Internet of Things Systems**. IEEE Transactions on Dependable and Secure Computing (Volume:PP , Issue: 99)

Automating heterogeneous IoT entities deployment

- How is this scenario possible???

- Vendors do not (usually?) collaborate for standards
  - LG oven with LG fridge, Samsung phone with Samsung TV, … or via client software e.g. Chromecast (my Xiomi phone 'talk' to my LG TV)

- Different standards in IoT/Smart cities or smart home automation

- Need for **Semantic Interoperability** solutions (smart gateways to support the automated deployment of IoT entities)

- Its all about **matchmaking/selection** of IoT entities (using **semantics**)

- A global semantic registry for IoT entities (e.g. using ontologies)

- A 'store' for smart applications (as Google's Play store) to download…

Example framework

- Semantic Smart Gateway Framework (SSGF) at VTT, Finland

- Syntactic (JSON to OWL) + Semantic interoperability (ontology alignment and matchmaking of 'things to applications' semantics) for the **automated deployment of IoT applications in smart environments** (e.g. smart home)

- Use of **IoT ontology as a semantic registry of IoT entities**: devices and applications
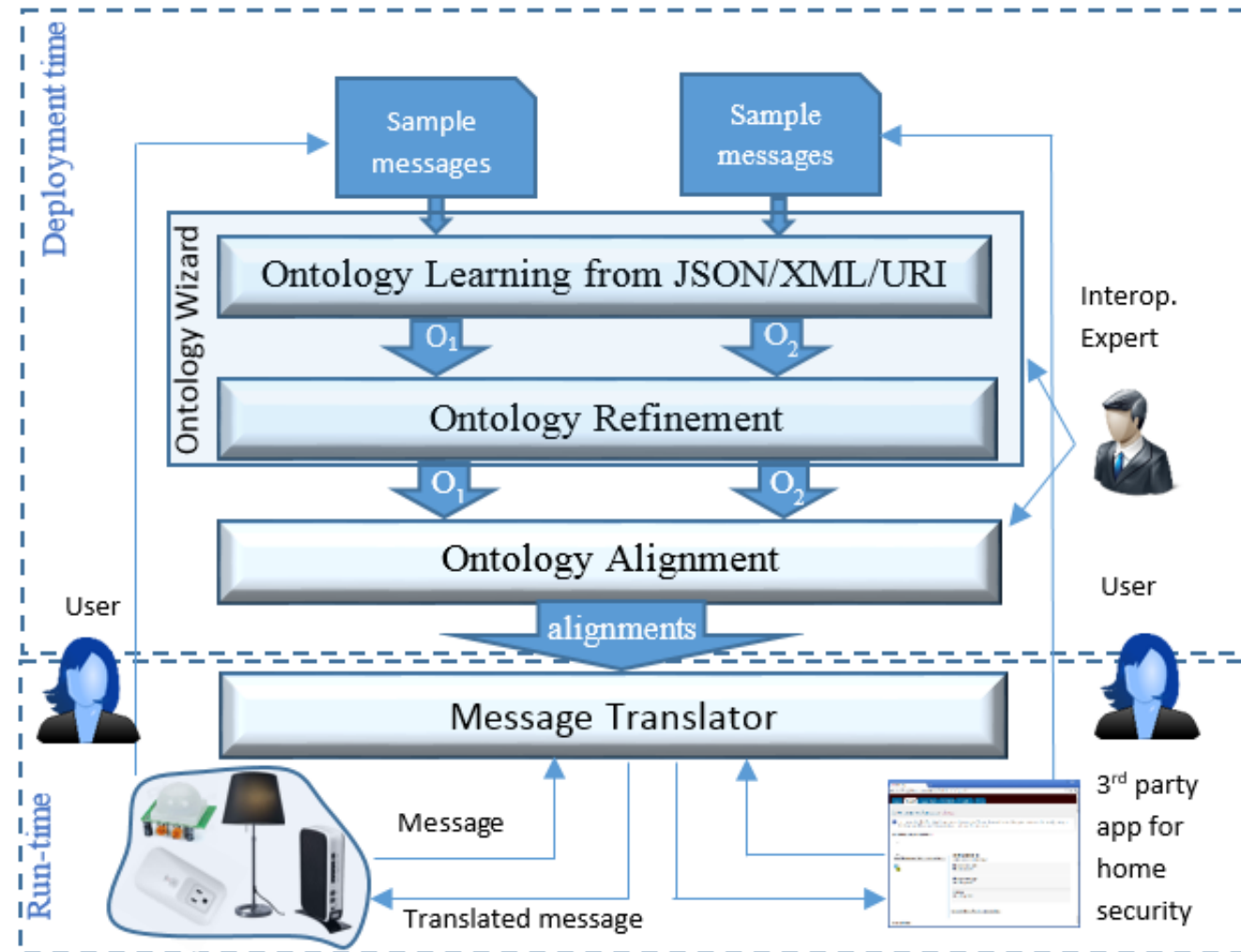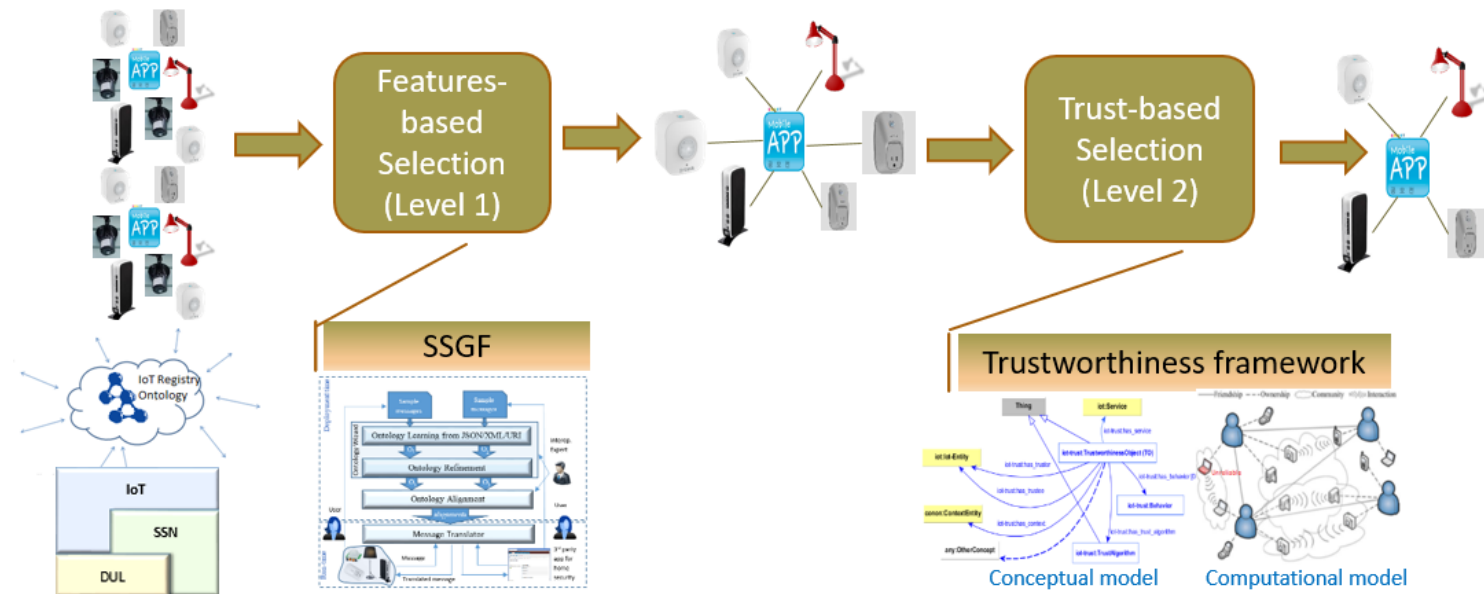

- The application is able to 'understand' motion detection events and issue commands to the switch actuator e.g. for switching on/off the attached device (lamp)
- The Switch actuator is able to 'understand' commands issued by the application
- The process is automatic and middleware-free

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Kotis, K., and A. Katasonov, "Semantic Interoperability on the Internet of Things: The Semantic Smart Gateway Framework", *International Journal of Distributed Systems and Technologies (IJDST)*, vol. 4, issue 3, pp. 47-69, 07/2013

IoT deployment in trustful environments

- IoT entity (app) need to
  - 'decide' on trustworthiness between the features-based matched devices (who to trust)
  - Select (from the features-based matched ones) the most trustworthy entities for its deployment

- **Trust Semantics in IoT Entities' Deployment**

More important.... **Who to Trust** vs Who to Match

Kotis, K., I. Athanasakis, and G. A. Vouros, "Semantically Enabling IoT Trust to Ensure and Secure Deployment of IoT Entities", *Int. J. of Internet of Things and Cyber-Assurance*, vol. 1, issue 1: Inderscience, pp. 3-21, 2018

Thank you for your attention!