



Services Foundation

Msc in Management - Services Science

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48 Hours - Event



<http://gsj11ge.eventbrite.com/>

11th-13th March 2011

La Muse, Centre d'émergence

2 Rue de la Muse

1205 Genève

Switzerland



Lecture 1: Summary

- Introduction to Services
 - Definitions
 - SaaS / PaaS / IaaS / Grid
- Software vs Service
- Services Science



Lecture 2: Summary

Software vs Services

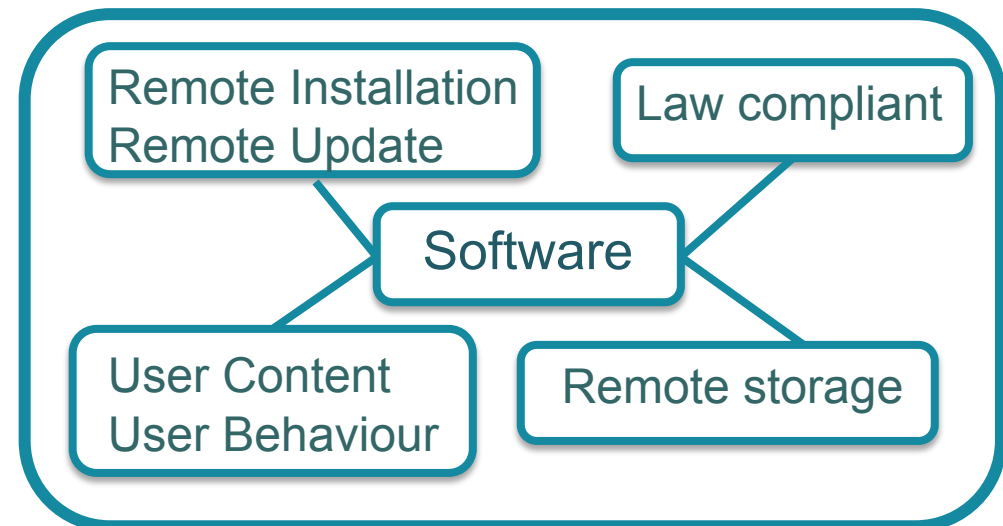
Specific Services

- Web Services
- Context-Aware Services
 - Location-Based Services
- Wearable Computers
- On-Line Games
- Social Media
- E-Government Services
- Services for the elderly
- Smart Systems

Software vs Services



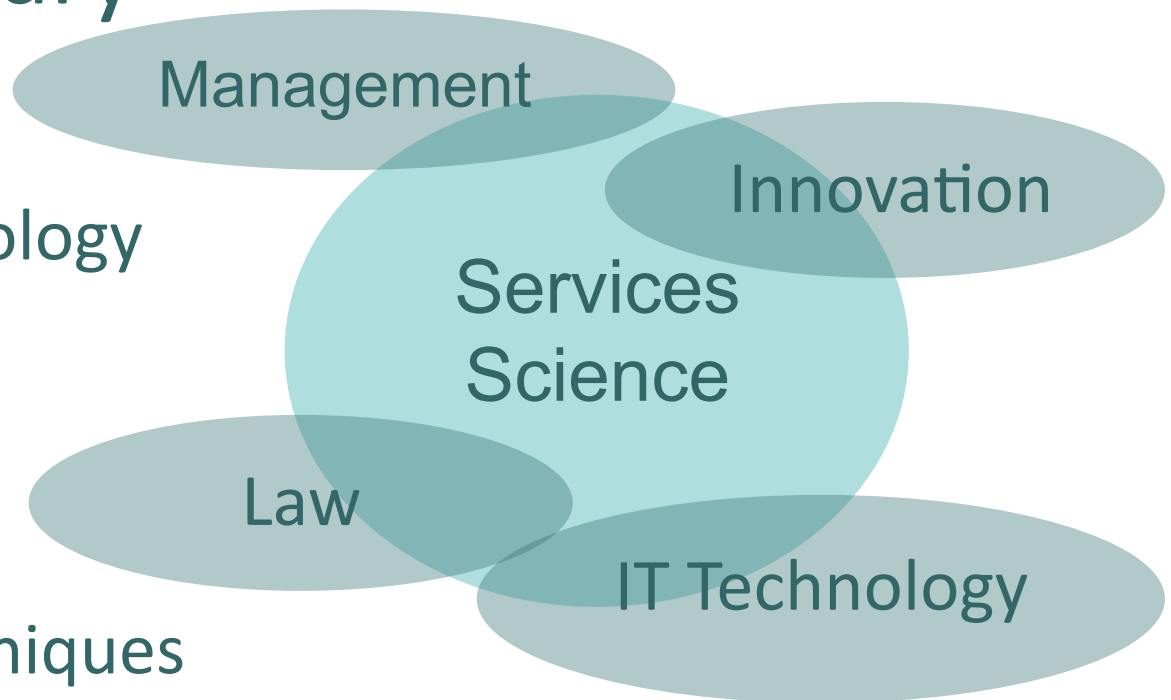
Process
Intangible
Consumer is co-producer
Instantly consumed



● ● ● | Services Science

Trans-disciplinary

- Management
- Services Technology and Models
- Legal Aspects
- Innovation and Creativity Techniques





Web Services

A **Web Service** is an application programming interface (API) or Web API that is **accessed via Hypertext Transfer Protocol (HTTP)** and executed on **a remote system**, hosting the requested service.

A Web Service is as a software system designed to support interoperable **machine-to-machine** interaction **over a network**.

http://en.wikipedia.org/wiki/Web_service



Web Services

Technology

- WSDL: Web Service Description Language
 - Describes interface
- XML: Extensible Markup Language
 - Message Format
- SOAP: Simple Object Access Protocol
 - Communication protocol
 - Exchange information in XML over RPC / HTTP
- RPC: Remote Procedure Call
- HTTP: Transport Protocol
- UDDI: Repository of Web Services Listing
 - Interrogated by SOAP messages, returns WSDL descriptions of Web Services
- WSIL: Web Service Inspection Language

Web Services

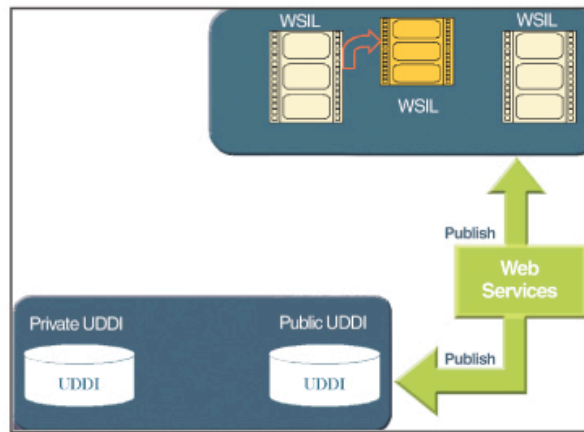


FIGURE 1 | Web services publishing process

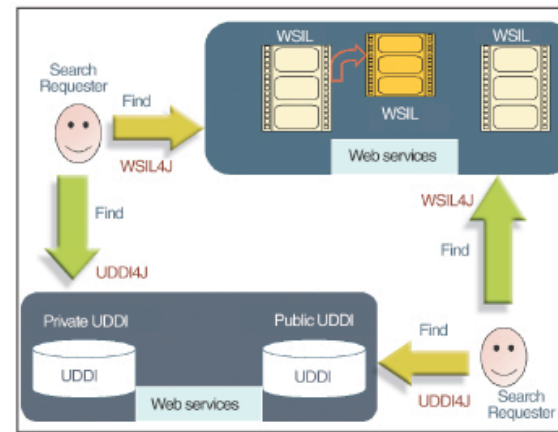
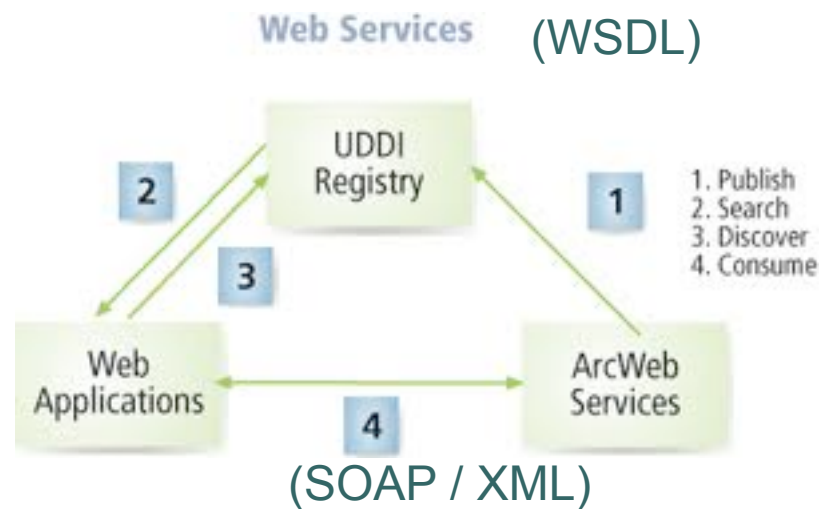
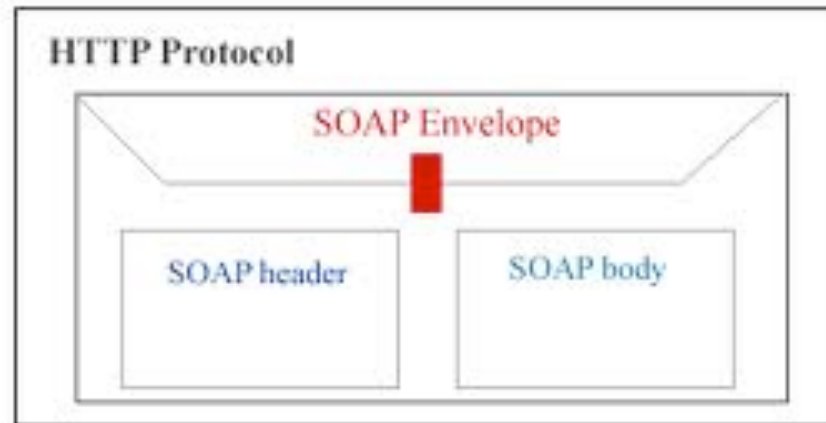


FIGURE 2 | Web services discovery





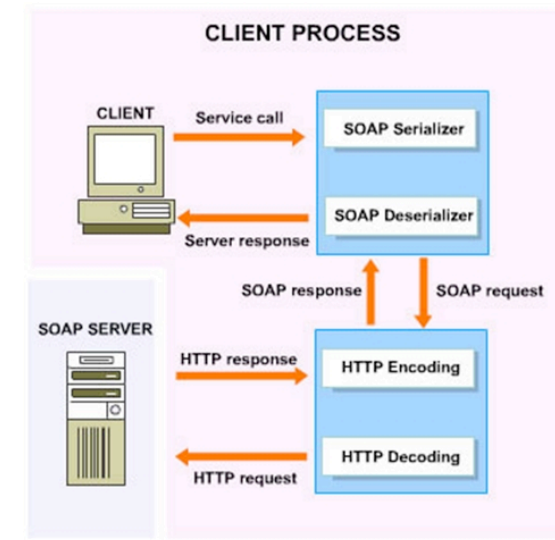
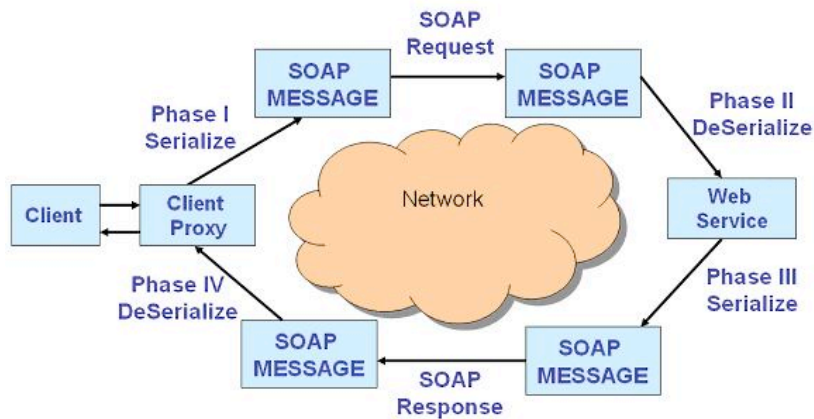
SOAP Message



A SOAP Message

HTTP-SOAP-XML

XML Web Services Architecture

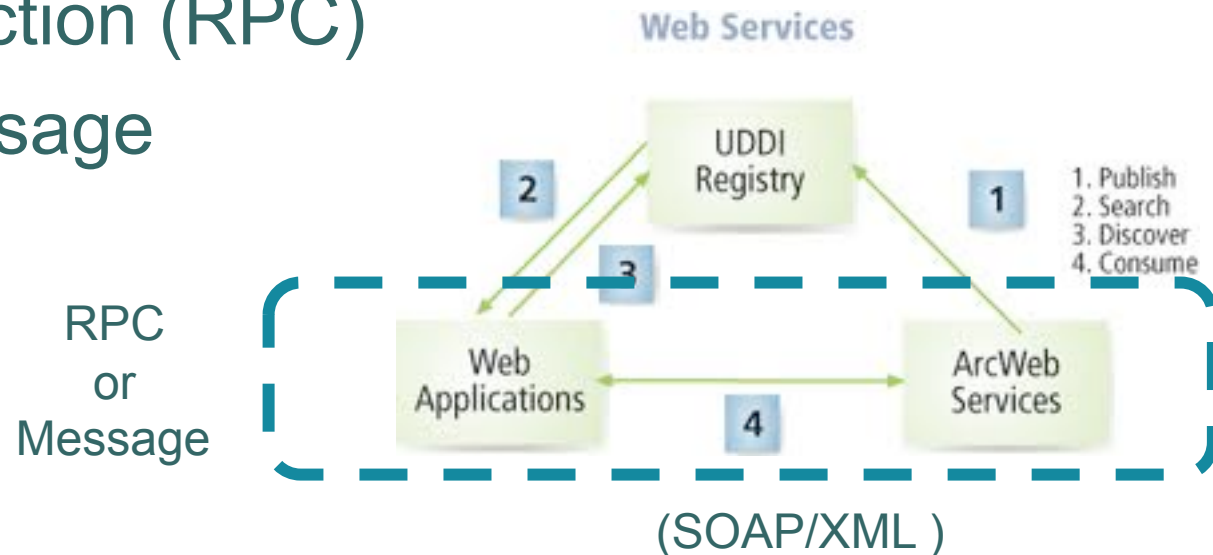


Service Invocation

Function-oriented vs Message-oriented

SOAP supports both

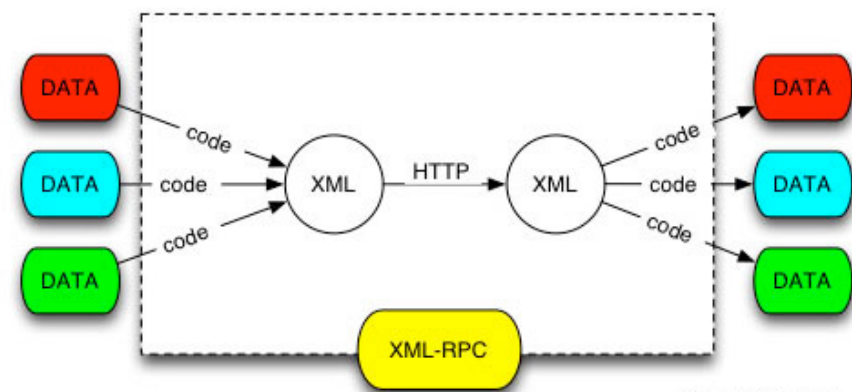
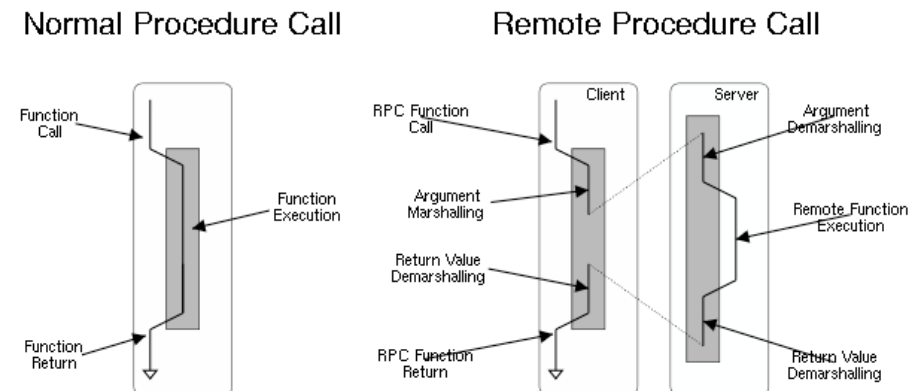
- Function (RPC)
- Message





RPC: Remote Procedure Call

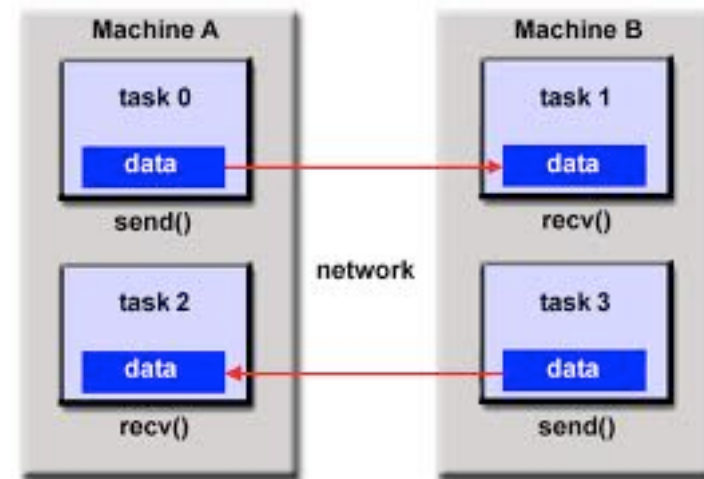
- RPC
 - Function-oriented
 - Tightly coupled
 - XML-RPC
 - XML: Encoding call
 - SOAP: Communication mechanism
 - HTTP: Transport mechanism



Source: JY Stervinou

● ● ● | Message-centric

- Communication through messages
 - Asynchronous
 - Loosely coupled
 - Event-based
 - XML: encoding message/event
 - SOAP: communication mechanism
 - HTTP: transport mechanism





Web Services Examples

Amazon Web Services



- Amazon Elastic Compute Cloud
- Amazon Simple Storage Services

Browsing for Web Services

<http://webservices.seekda.com/browse>



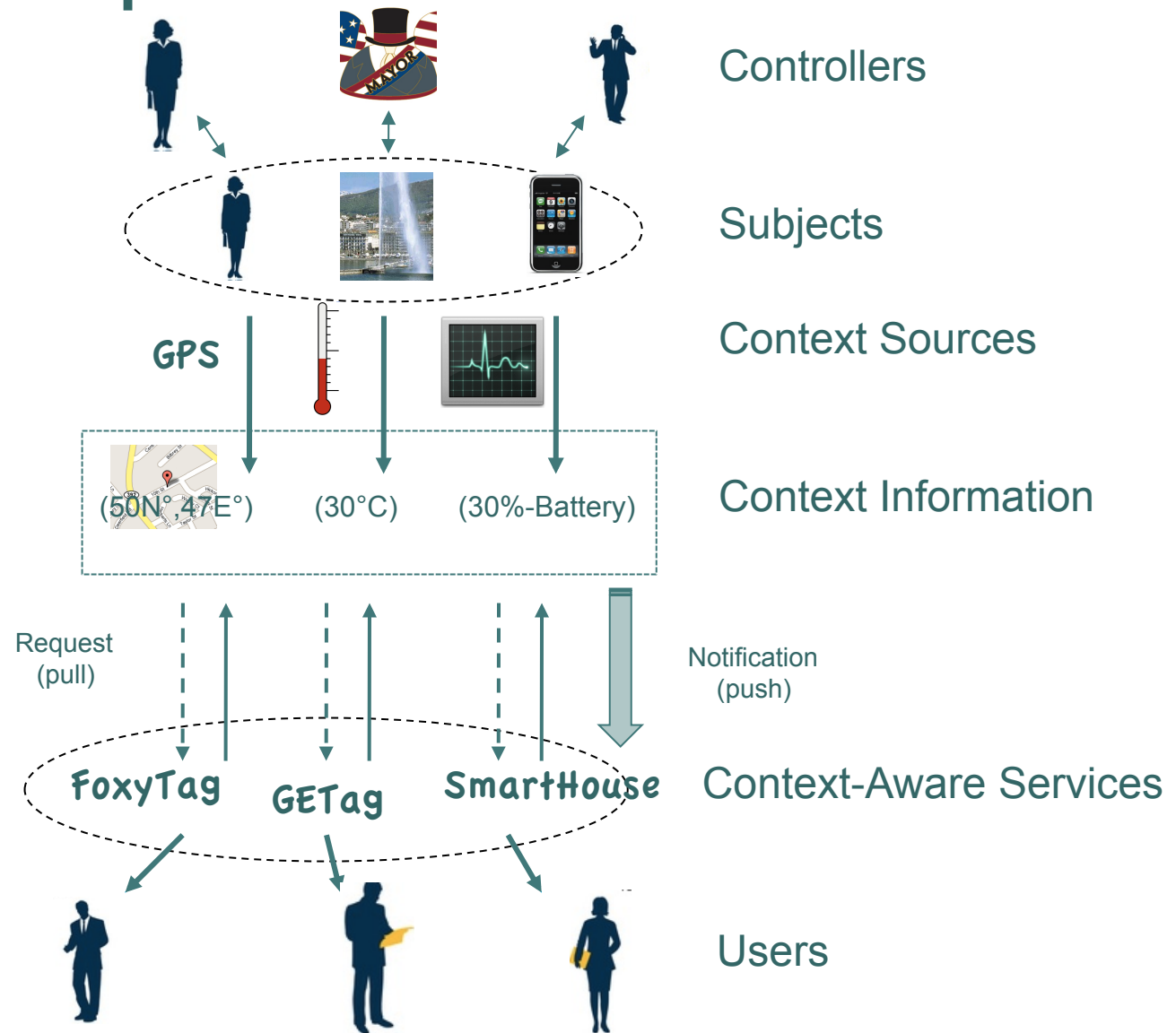
Context-Aware Services

What is a context?

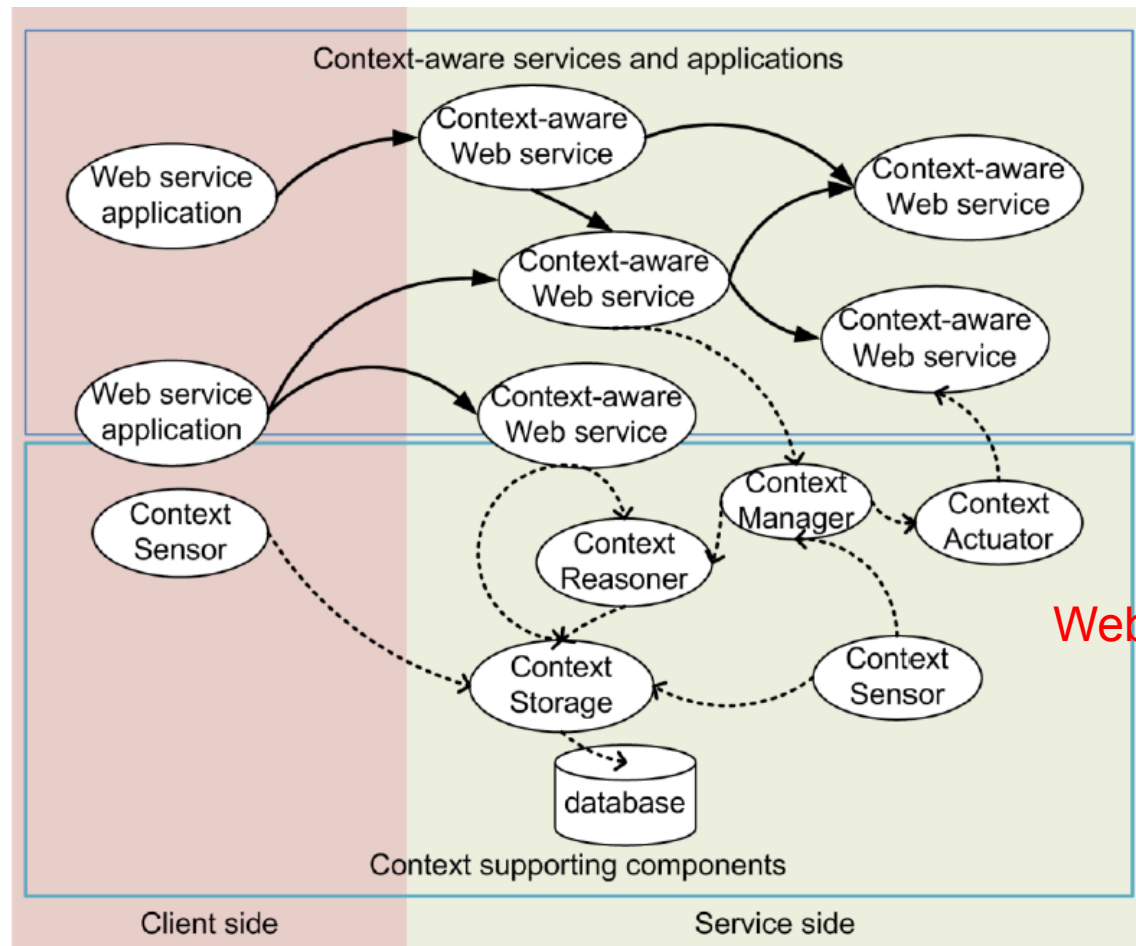
- Location
- Profile of user
(teacher, child, elderly, interests, shopping list)
- Time
- Presence
- History of past behaviour
- Weather information



Concepts



Context-Aware Web services



[Truong]



Context-Aware Web Services

- **Context information and context representations:** how to model context information in Web services? XML, OWL, Ontology
- **Context sensor:** how context information is measured and sensed? Polling, Web Services, Push, Pull
- **Context storage:** how context information is stored and how the information is accessed from its storage? Database accessed through a Web service
- **Context distribution:** How applications and services can retrieve context information? SOAP (Web service)
- **Context adaptation :** why context information is used in Web services? To select the best service, to select communication protocols (optimisation), to adapt content (e.g. mobile web service). How is adaptation performed? Middleware or service.

[Truong]



Location-Based Services

A **location-based service** is an information or entertainment service, accessible **with mobile devices** through the **mobile network** and utilizing the ability to make use of the **geographical position of the mobile device**

http://en.wikipedia.org/wiki/Location-based_service



Location-Based Services

Domains

- m-health
- Tags
- Identifying person or locations (closest Chinese restaurant, closest cash machine, ..)
- Vehicle tracking
- e-commerce, mobile advertising
- Location-based games



Location-based Services

Locating methods

- User enters postcode
- Global Positioning System (GPS)
 - GPS receives computes travel time of code from satellite to receiver
(2D: 1, 2, or 3 satellite – intersection;
3D – 4 satellite)
- Differential GPS
 - More accurate than GPS: correct delay of signal travelling through atmosphere
 - Reference station computes correction and broadcasts it to GPS receivers
- GSM based – (cell sites)
 - Cell-ID: base transceiver station with which the phone is registered





Location-Based Services

Location representation (raw data)

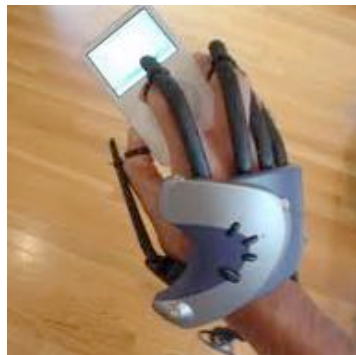
- Coordinates +/- error

Notification techniques

- Push / pull
 - SMS (discount for café/theatre, advertisements)
 - Visualisation on a map
 - XML, specific formats for GIS (GML)



Wearable Computers



<http://www.cc.gatech.edu/fce/pubs/iswc97/wear.html>



Wearable computers

Domains

- Augmented reality
- Health and disabilities
- Electronic textiles
- fashion design
- Defense

Characteristics

- Continuous availability
- Interaction with user



Wearable Computers

Contextual Sensing

- Wearable computer **adds sensing capabilities to the user**: e.g. sensing location

Contextual Adaptation

- Wearable computer **adapts to current situation** (e.g. adapt screen to current light)

Contextual Resource Discovery

- Wearable computer **senses other wearable computers or resources** nearby + exploits them (e.g. display content on a large screen)

Contextual Augmentation

- Wearable computer **adds information to the environment** (e.g. stick-e notes attached to locations - tags)



On-line Games

Single player

Multiple players

Massively multiple players

Multi-users virtual worlds

also through Smart Phones Games

● ● ● | On-line Games

Single player

- Registration
- Store own results
- Scores of other players are visible
- Browser based
- Flash Technology

Examples:

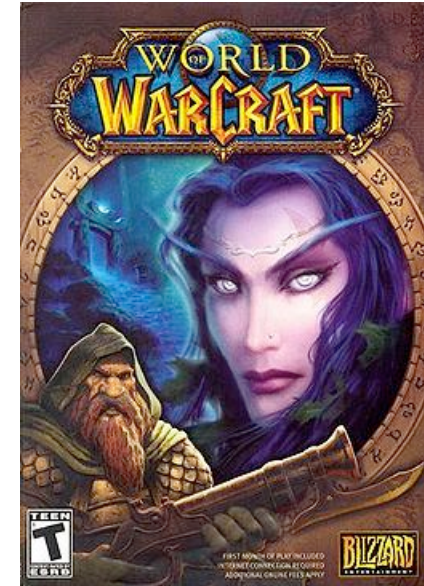
- Pac-man
- Law-based:
 - <http://www.netla.ch/fr>
- Educational
 - International Math games with contest



● ● ● | On-line Games

Massively multi-players online games

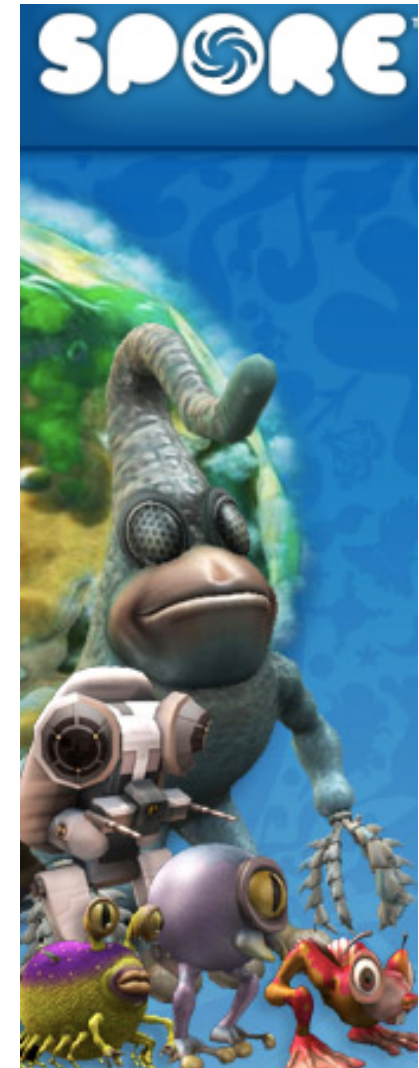
- Role-playing, Strategy, Shooting, Social, Real-time Simulations
- Examples
 - Adventure Quest World (role-playing)
 - World of WarCraft
- Through Browsers, Mobile Phones, Games consoles
- Technology - Real-time challenge
 - Database
 - Sharing players among servers + synchronising



● ● ● | On-line Games

Multi-users virtual worlds

- Neo-Pets
 - Single players, multiple players interactions
- Second Life
 - Virtual world, currency
- SPORE
 - Evolution stages, strategy





Social Media

Facebook

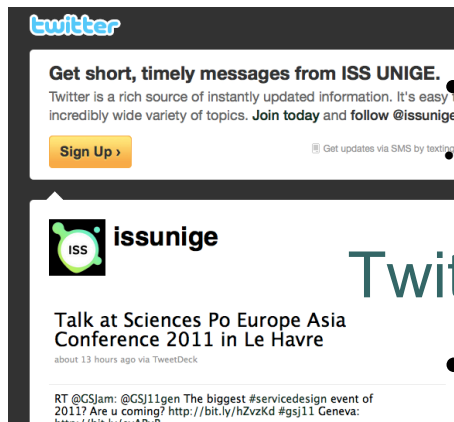
- Wall, Videos, Photos, Articles
- Friends
- Politics, Companies, Individuals

(Apple) <http://www.facebook.com/group.php?gid=2204622626#!/group.php?gid=2204622626&v=wall>



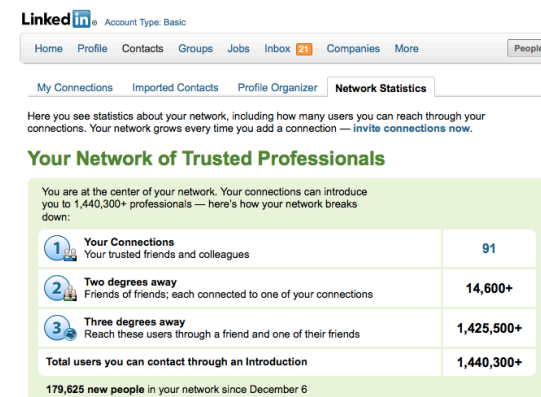
Twitter

- Micro-blogging (tweets)
- <http://twitter.com/issunige>



LinkedIn

- Professional network
- Contacts, Groups, Jobs





Merging Social Media and Games

Social Media +

Massively Multi-Player Online Games

- Targeted at Businesses
- Real-Time Platform for:
 - Serious Games
 - for real world business activities
 - Games for collaborative decision making
 - Logistics
 - Supply-chain
 - Stock Exchange

<http://www.theinfoboom.com/articles/social-media-and-massively-multi-player-online-games-for-business/>

E-Government Services

Taxes

Information

Public Transport

On-line payments (fines)

Library (booking, renewal)

New address

The screenshot shows the Transport for London website. At the top, there's a navigation bar with links like Home, Live travel news, Getting around, Tickets, Road users, Corporate, and Business & partners. Below this, there's a 'Live travel news' section with a search bar and a 'Text version' link. A 'Service update at 20:33' section mentions engineering works. A table lists various lines and stations with their service status (e.g., Bakerloo, Central, Circle, District, Hammersmith & City, Jubilee, Metropolitan, Northern, Piccadilly). On the right, there's an 'Infos réseau' section and a 'Recherche d'itinéraire' (Journey Planner) form with fields for departure and arrival points, date, and time. A 'Rechercher' (Search) button is at the bottom of the form.

The screenshot shows the Waltham Forest Libraries website. It features a search bar at the top with options for Keyword Search, Author Search, Title Search, ISBN Search, and Advanced Search. Below the search bar, there's a 'Welcome to the London' message and a list of library branches: Barking and Dagenham (BAR), Brent (BRE), Enfield (ENF), Ealing (EAL), Hackney (HACK), and Havering (HAV). A 'Search' box is also present with fields for author (lastname, first name) and keyword. The bottom of the page mentions 'Access the library catalogue and its in'.

Are you moving house?

iammoving.com
Your FREE change of address service

The screenshot shows the Singapore Citizen Portal. It has two main sections: 'ONLINE PAYMENT' and 'POPULAR E-SERVICES'. The 'ONLINE PAYMENT' section includes tabs for 'Licences', 'Fees', and 'Fines', with a 'MORE' button. Below these, there's a 'Tax payment' section with links for 'nity Clubs/Centres /Activities', 'Parking Charges for HDB Workers Levy', and 'l for School Fees'. The 'POPULAR E-SERVICES' section has a 'General' tab with a list of services: 'Access myTax Portal', 'Check CPF account', 'Report an incident', 'Submit HDB resale application', 'Plan your public transport route', and 'Give us your feedback on national issues and policies'.

<http://www.ecitizen.gov.sg/>



Services for the Elderly

- Information
- Home care services
 - Alarm
 - Report abuse
- Home services
 - Shopping Service
 - Meals
- Supports for families

Community and Living > Services for the elderly/disabled

Services for the elderly/disabled

This section contains information about services for the elderly and disabled in the Epsom & Ewell area.

Our Services

Information Directory	Age Concern Epsom & Ewell Information Directory of Services for older residents in Epsom and Ewell
Routecall	The door to door transport services including Dial-a-ride and Dial-a-bus
Community Alarm	The scheme that will give you help at the touch of a button
Meals on Wheels	The service that delivers daily meals to housebound or frail residents
Shopping Service	The grocery delivery service offered to housebound residents
Home Services	Provides advice with financial, medical and personal issues to help people stay independent
Shoptmobility	Service that can help residents with mobility problems whilst shopping
Healthcare	General healthcare information and links to NHS Services
Disabilities	General advice and information for accessing services
Handyman Service	Information on small odd-job repairs

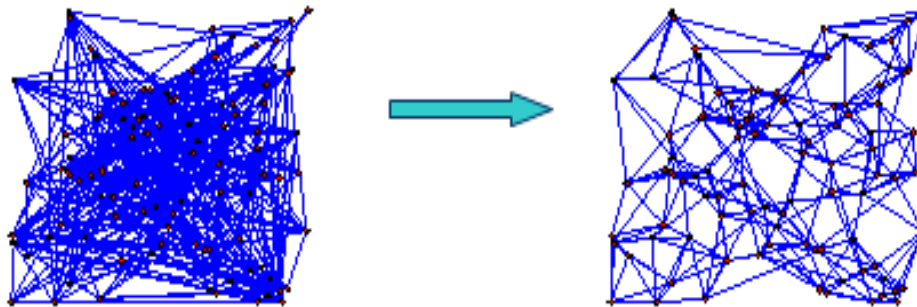
<http://www.epsom-ewell.gov.uk/EEBC/Community+and+Living/Services+for+the+elderly+and+disabled/>



Smart Systems

Examples from current research

Self-Organising Overlay Networks



<http://research.microsoft.com/network/soon.aspx>



Smart Robots



<http://www.swarm-bots.org/>



Smart Systems

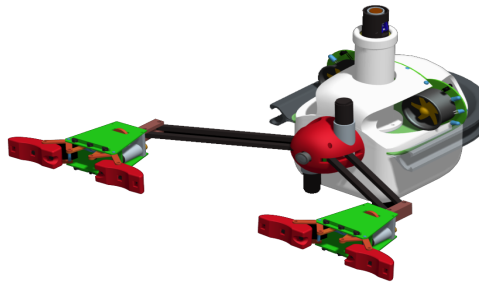
Examples from current research

Swarms of robots (Swarmanoid)

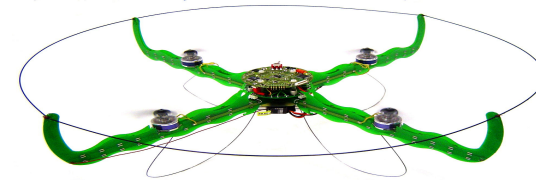
- Coordination among heterogeneous robots



foot-bot



hand-bot



eye-bot

<http://www.swarmanoid.org/>



Smart Systems

Examples from current research

Intra-vehicular Networks (Autonomos)



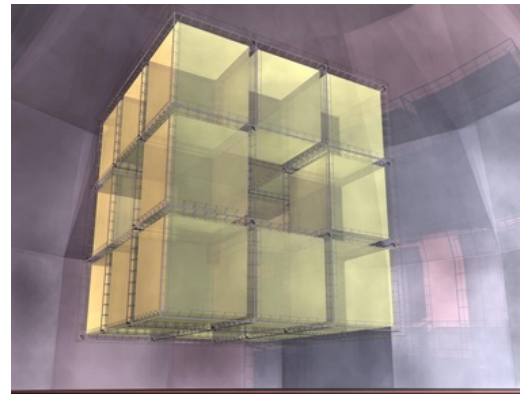
<http://www.auto-nomos.de>



Smart Systems

Examples from current research

Self-assembling square balloons (Mascarillons)



<http://www.mascarillons.org/>

<http://www5.epfl.ch/swis/page2521.html>

● ● ● | Smart Systems

Technology

- Agents (processes)
 - Active autonomous entities
- Local information
 - Local communication with neighbours
- Decentralised, **self-organising** algorithms
 - Bio-inspired (ants, fish, gossip, wasps, ...)
- Middleware
 - Supporting self-organising mechanisms





Robots Simulation [Picard 05]

- Robots

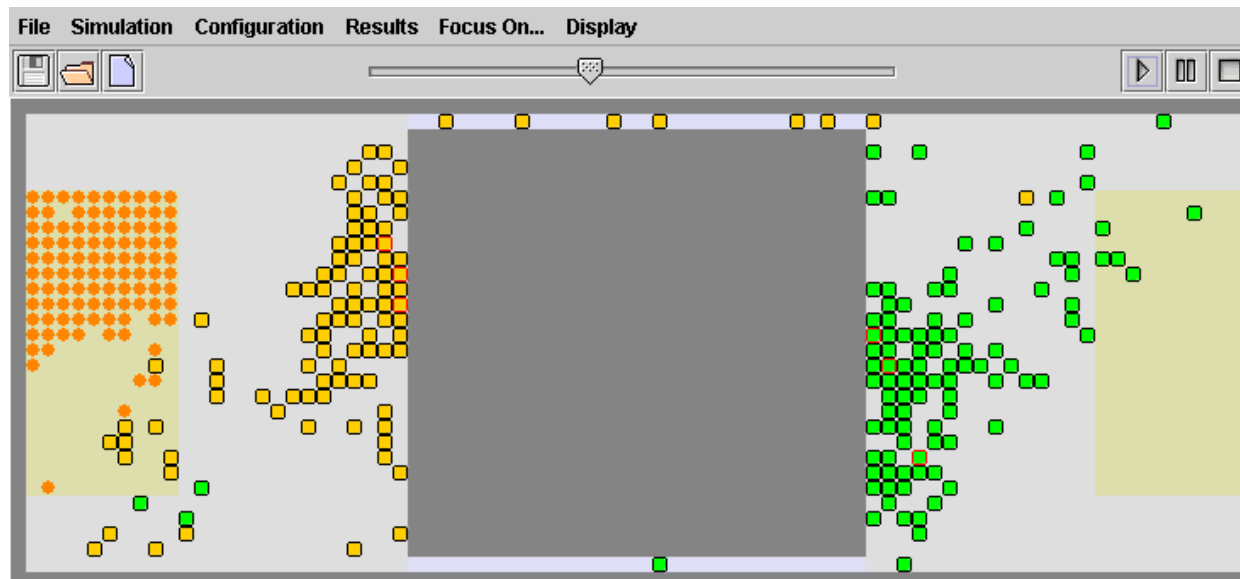
- Autonomous
- Resource transportation task
- Internal State guided
- Micro-level entity

- Environment

- Two rooms
- Narrow corridors separate the rooms
→ spatial interference

- Emergence of a traffic direction

- not coded in robots



● ● ● | Boids - Simulation

Full Simulation

Alignment only

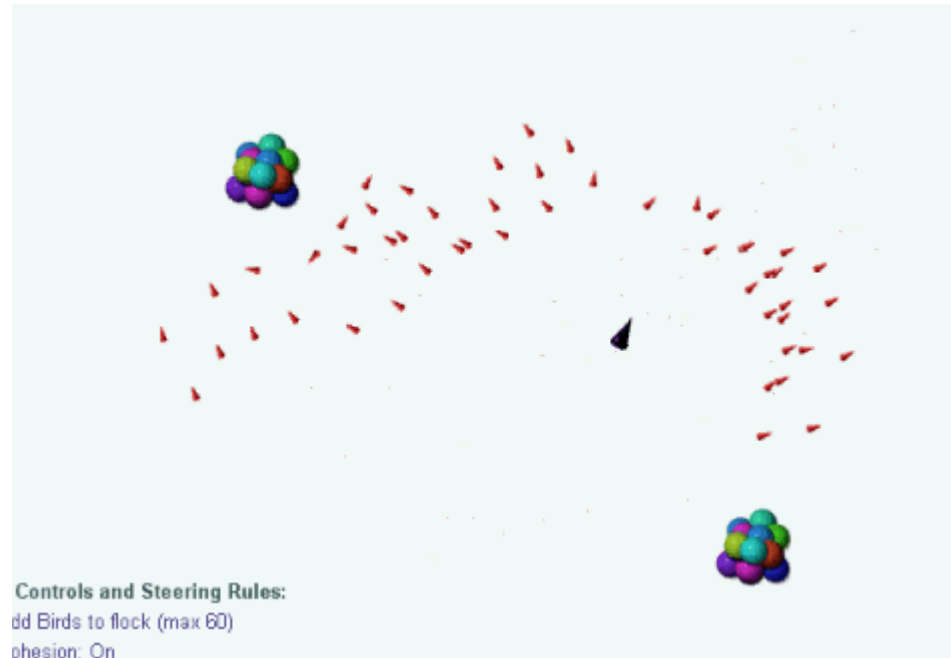
Cohesion only

Separation only

Cohesion and Alignment

Separation and Alignment

Cohesion and Separation



Boids - Applications

Games / PlayStations

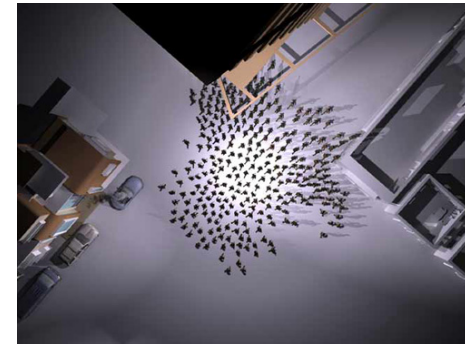


Crowd behaviour

Crowd dynamics

Emergency escapes

Building design



Movies

Spiderman, Lord of the Ring

Crowd behaviour





Summary

Specific Services

- Web Services
- Context-Aware Services
- On-line Games
- Social Networks
- Wearable Computers
- e-Government Services
- Smart Systems



Recommended Reading

[Truong] HL Truong. A survey on context-aware web service systems

<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.159.9731&rep=rep1&type=pdf>

[Ralph et al.] D. Ralph, S. Searby (Eds). Location and Personalisation : Delivering Online and Mobility Services. BT Communciations Technology Series 8. IEE Publisher. 2004.

[Schmidt et al.] Barbara Schmidt-Belz, Achim Nick, Stefan Poslad, Alex Zipf. Personalized and Location-based Mobile Tourism Services

<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.11.8983&rep=rep1&type=pdf>

[Pascoe] J Pascoe. Adding generic contextual capabilities to wearable computers

<http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.27.5519&rep=rep1&type=pdf>