



Knowledge-driven Content Processing & the Semantic Web

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Knowledge Technologies & the Semantic Web

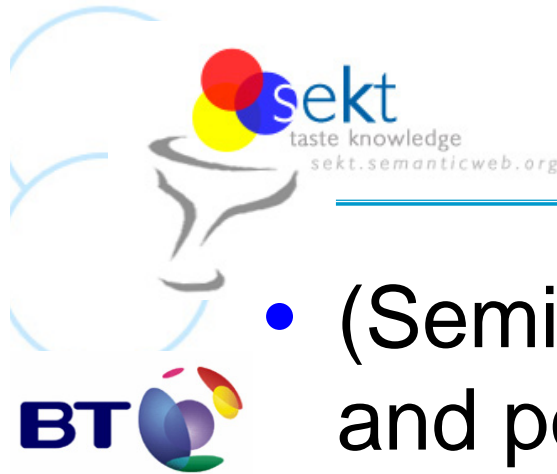
John Davies

Next Generation Web Research, BT



Next Generation Web(s) will be...

- Ubiquitous
 - Access via multiple devices
 - Device independence via CC/PP (RDF ontology)
- Personalised
 - context-aware: current activity, interests, location
 - seamless knowledge delivery
- On demand
 - interoperability of services via SWS
 - utility computing; virtual enterprise networks
- **Multimedia**
- **Semantic**
 - Ontologies and metadata
 - Seamless access to heterogeneous data sources



Research Agenda

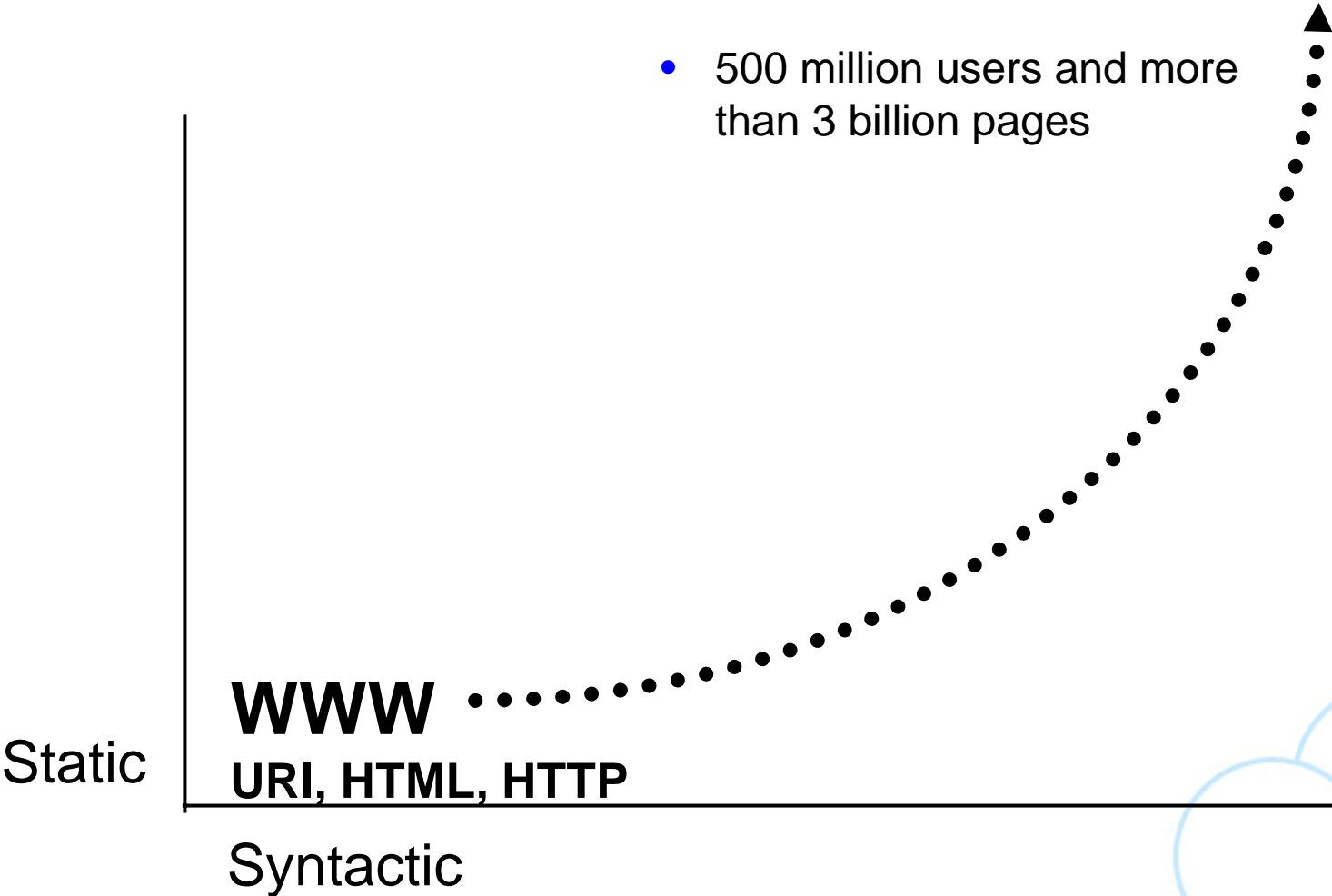
- (Semi-)automatic ontology generation and population
 - dealing with legacy information and metadata creation overhead
 - multimedia & multimodal annotation
- Uncertainty and inconsistency
 - robust and failure-tolerant
- Mediation
 - linking semantic webs



Business Drivers in BT

- 2 opportunities
 - Semantic web services
 - Semantic knowledge management

Semantic Web Services





Semantic Web Services

Serious Problems in

- information finding,
- information extraction,
- information representation,
- information interpretation and
- and information maintenance.

Static

WWW
URI, HTML, HTTP



Semantic Web
RDF, RDF(S), OWL

Syntactic

Semantic



Semantic Web Services

Dynamic

Web Services

UDDI, WSDL, SOAP



Bringing the computer back as a device for computation

Static

WWW

URI, HTML, HTTP



Semantic Web

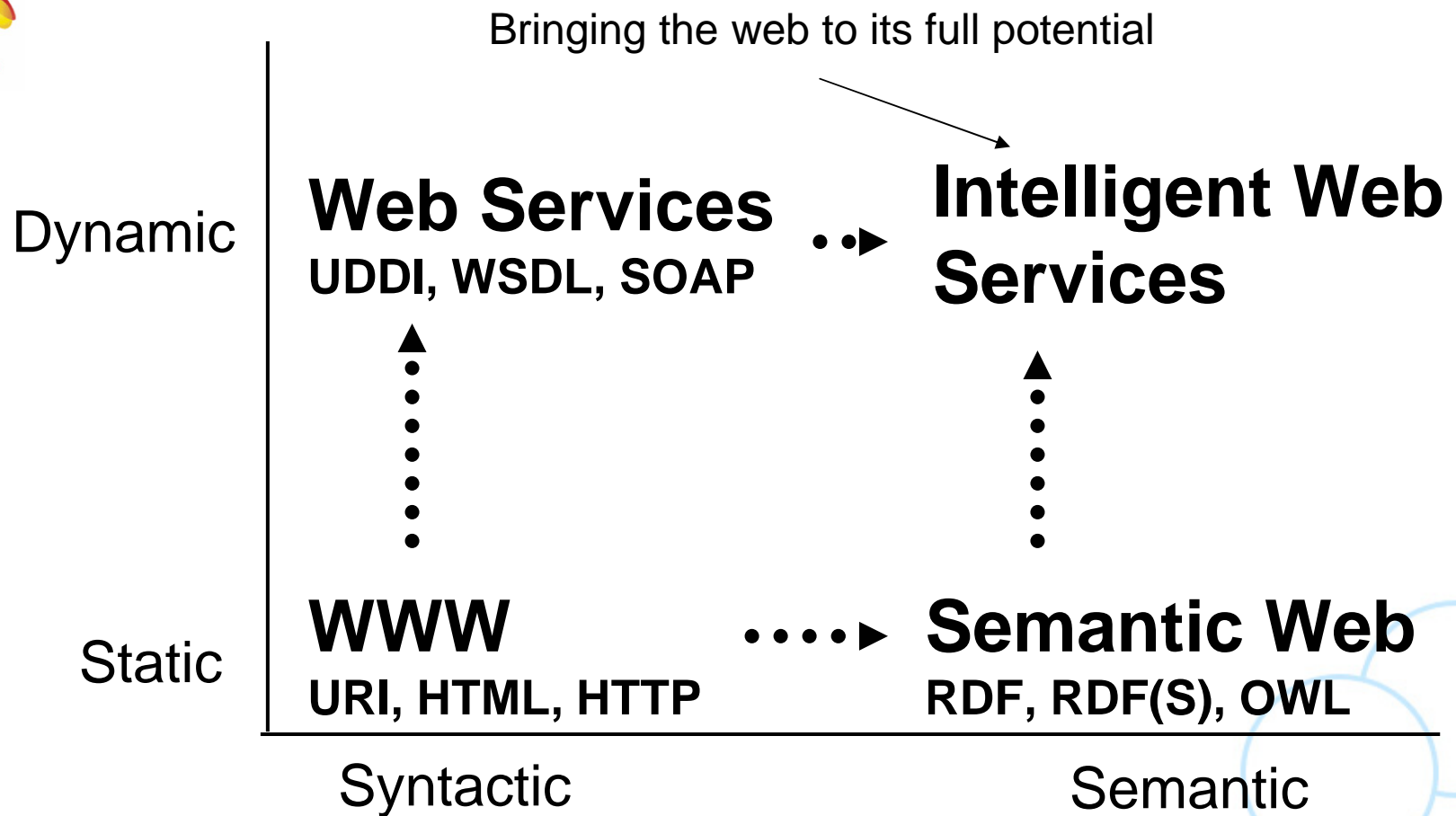
RDF, RDF(S), OWL

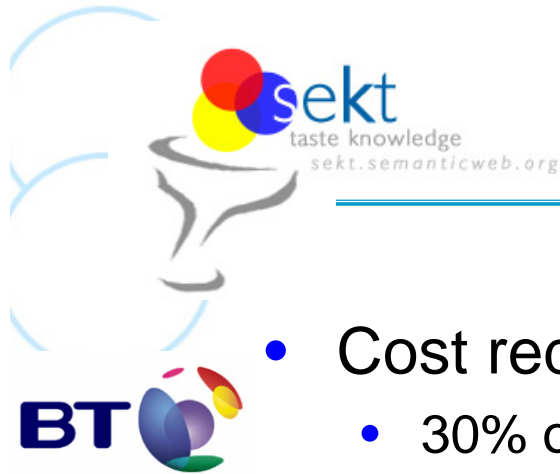
Syntactic

Semantic



Semantic Web Services





Business Motivation – SWS

- Cost reduction
 - 30% of IT costs are on integration (Gartner)
 - To reduce the cost associated with service creation and modification
- Re-use
 - To encourage reuse of components across services
- Customer satisfaction
 - Flexibility & speed of integration
- Response to Regulatory Issues (interoperability)
 - Simpler integration with business partners
- Reduced time to market
 - Faster service discovery & composition

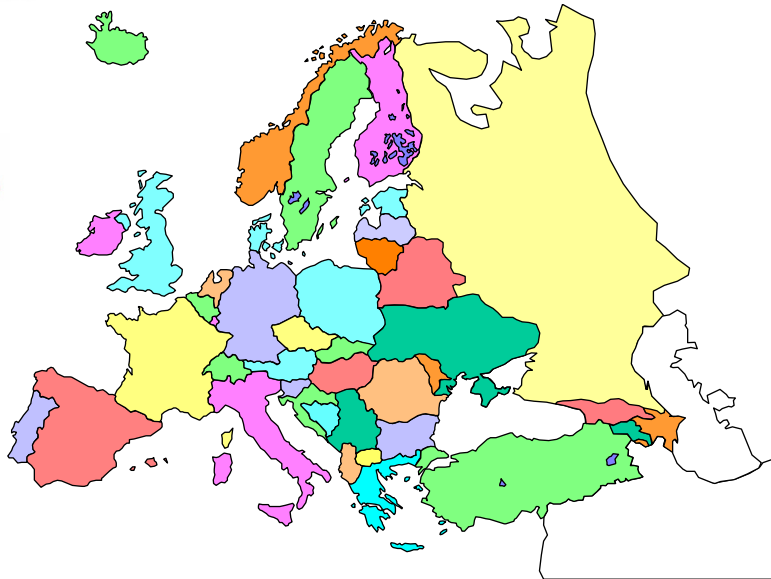


DIP – Mission and Objectives

- IST 6th framework Integrated Project
 - dip.semanticweb.org
- Mission
 - to make Semantic Web Services become a reality as the new infrastructure for eWork and eCommerce
- Objectives
 - Combine Semantic Web technology with Web Services for semantics-based services.
 - Apply SWS in real world scenarios
 - Develop and promote appropriate standards and infrastructure in this area



DIP – Partners



- **National University of Ireland, Galway**, Ireland
- **British Telecommunications Plc.**, UK
- **Swiss Federal Institute of Technology**, Switzerland
- **Universität Innsbruck**, Austria
- **ILOG SA**, France
- **SAP AG**, Germany
- **Tiscali Österreich GmbH**, Austria
- **Fundacion De La Innovacion.Bankinter**, Spain
- **Berlecon Research GmbH**, Germany
- **Essex County Council**, UK
- **Forschungszentrum Informatik**, Germany
- **inubit AG**, Germany
- **Net Dynamics Internet Technologies GmbH u. Co KG**, Austria
- **Sirma AI Ltd.**, Bulgaria
- **The Open University**, UK
- **Unicorn Solution Ltd**, Israel
- **Vrije Universiteit Brussels**, Belgium
- **Intelligent Software Components, S.A**, Spain

dip.semanticweb.org



Business Motivation – Semantic KM

- Corporate workers are overwhelmed with information:
 - from intranets, emails, external newslines ...
 - but may still lack the information they require
- For improved efficiency and effectiveness they need information:
 - identified by semantics, not just keywords
 - identified by their interests and their task context
 - in a form appropriate to their current physical context
 - mobile phone, PDA, blackberry, laptop, ...



Semantic Web & KM

- Making WWW information machine processable
 - annotation via ontologies & metadata
 - offers prospect of enhanced knowledge management
 - ~~• “Rank all the documents containing the word Tolkien”~~
 - “Show me the non-fiction books by Tolkien about philology before 1940”
 - Integration of heterogeneous data sources
- The SEKT project
 - EU collaborative
 - €12m, 12 partners



The Semantic Desktop

- context-aware tools for access to semantically-annotated knowledge tools
 - search, browse, visualise, summarise, share, infer
 - integrated into day-to-day business processes
 - automatic knowledge delivery based on current context
 - activity, location, device, interests
 - support multiple end-user devices (RDF-based)
- also support for on-the-fly metadata creation
 - metadata creation as a side-effect of data creation

Summary



- Application of SW technology to
 - System & process interoperability
 - Knowledge management
- Research challenges remain
- Starting to deploy real applications
- We should be positive and realistic

Questions?



Thank you for your time

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