


OBJECT-ORIENTED MODELLING (OOM) - 32536 MODULE 10

Emerging technologies and OO Design
(Advanced Topics – POOD Chapter 10)

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Module Outline

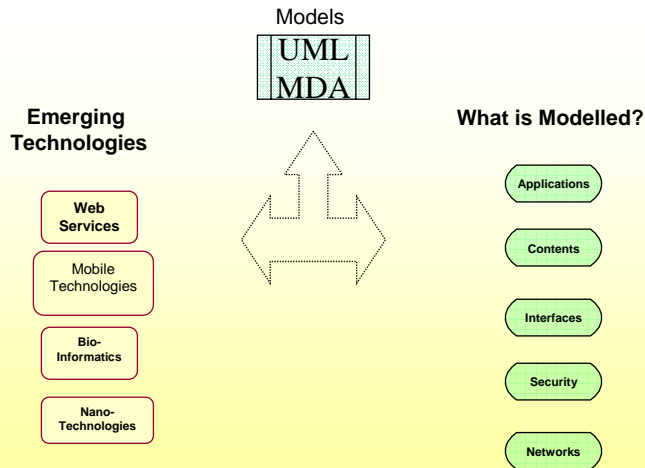


- Basics of Emerging Technologies
- Web Services:
 - HTTP; SOAP; XML; WSDL; UDDI
- Modelling Web Services with UML

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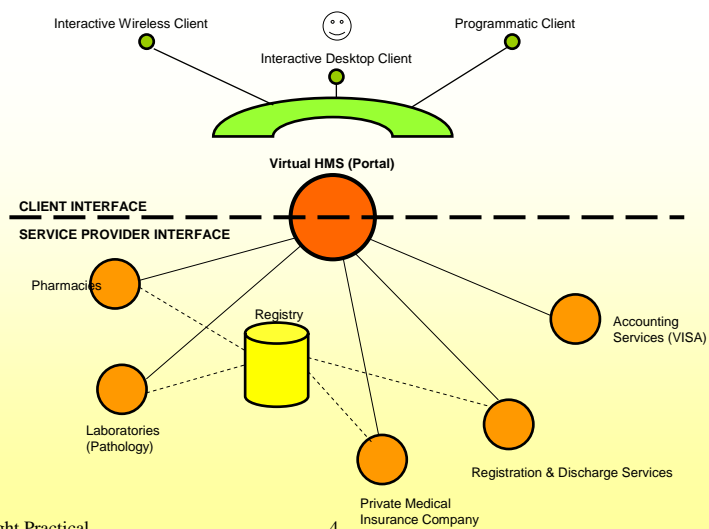
Modelling Domains for Emerging Technologies



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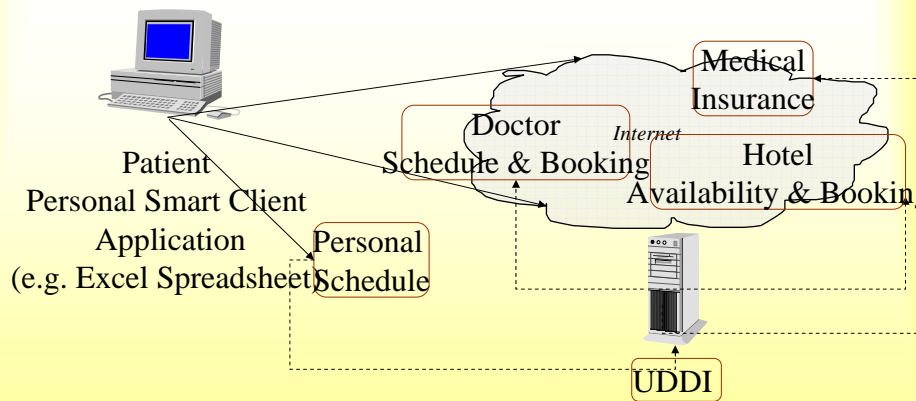
Web Services – A Practical Scenario



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Web Services bring together Data and Information from Various Domains resulting in a Unified View to the Client (Patient) of Web Services



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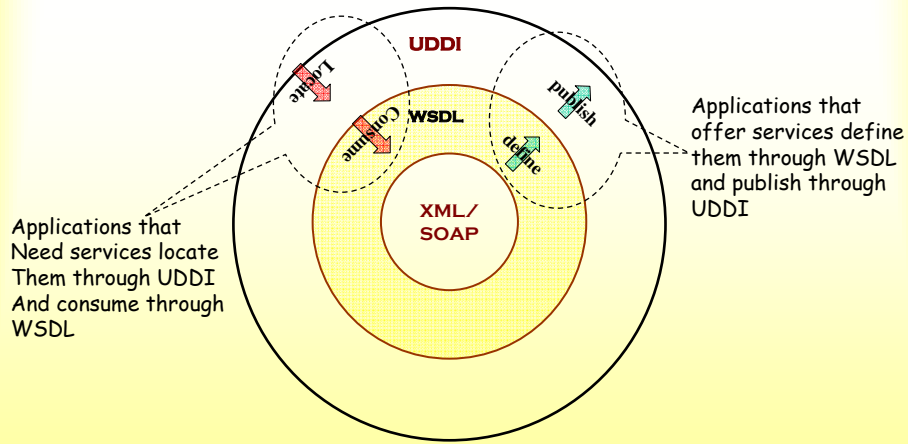
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Sub-module

Web Service Technologies and the UML

HTTP; SOAP; XML; WSDL; UDDI;

Technology Layers in Web Services



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Protocol Layer: HTTP

- **Hyper Text Transfer Protocol**
- Web browsers (Netscape, Internet Explorer) use protocols like http to access the web
- **HTML - Hyper Text Markup Language**
 - Provides Document Layout and Hyperlink Specification for WWW browsers
- Business uses the Secure HyperText Transfer Protocol
- Other protocols: ftp:// telnet:// smtp:// mime://

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Information Layer: XML

- **XML = EXtensible Markup Language**
 - A subset of SGML (Standard Generalized Markup Language)
 - Independent of Platform, Language or Tool
 - XML facilitates Interchange of Structured Documents over the Net
 - Extensively used in EDI, Multimedia Publishing and Workflow Management
 - Bulky and for Non-Real time B2B applications

Packaging Layer: SOAP

- Simple Object Access Protocol (SOAP) provides a framework to invoke services across the Internet, independent of Languages
- SOAP is text-based encoded XML, running over HTTP:
 - Encoding rules that define how messages should be processed
 - An envelope, which provides the framework for packaging message information
 - An RPC representation that defines how to represent remote procedure calls and responses

SOAP Overview

- **SOAP = Simple Object Access Protocol**
- Mechanism to send XML messages
 - Consistent envelope
 - Header and body
 - Consistent data encoding
 - Based on XML Schema type system
 - Protocol binding framework
- Provides the interface to a Web service
 - Document style
 - RPC style

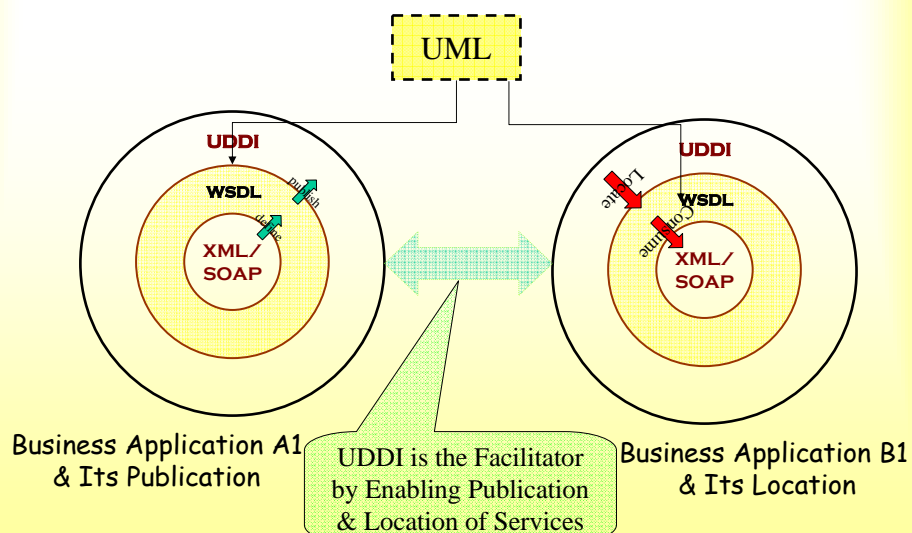
Service Layer: WSDL

- **WSDL = Web Services Description Language**
- **Web Services Description Language defines the Interfaces to Web Services**
 - What the Web Services do
 - How to communicate with the Web Services
 - Where to find the Web Services
- **WSDL is also XML based**

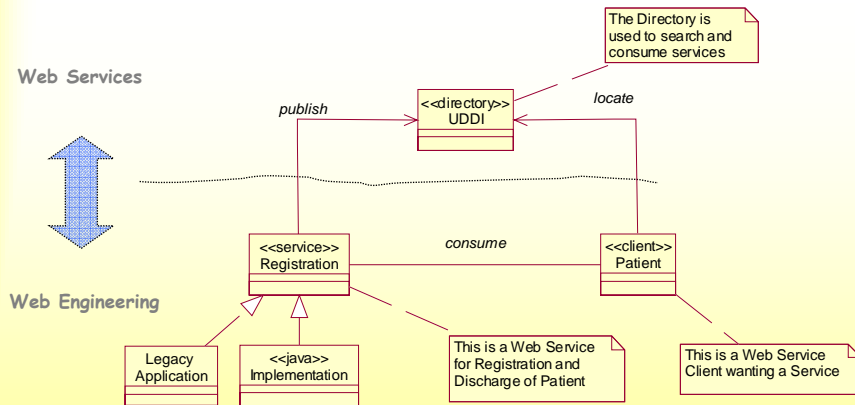
Discovery Layer: UDDI

- Universal Description, Discovery and Integration (Current Version 3.0; www.uddi.org)
- It is a “meta service” for locating web services
- Useful in private as well as public deployments.

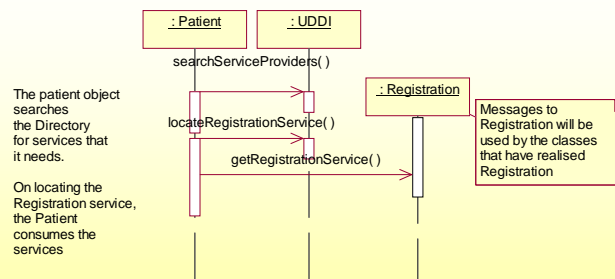
Web Services – Usage and Modelling



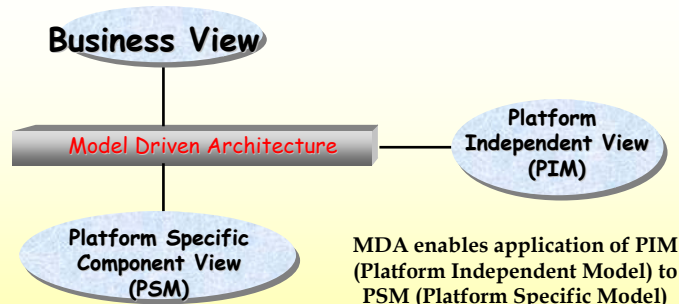
Web Service Meta Model using the UML (HMS Example)



Sequence Diagram Explaining Web Services Dynamics



Understanding OMG's Model Driven Architecture (MDA™) in Application Design



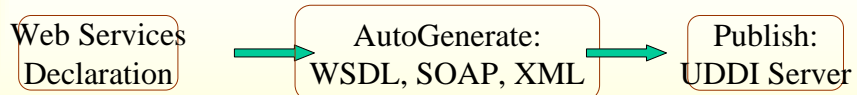
MDA enables application of PIM (Platform Independent Model) to PSM (Platform Specific Model) Resulting into essentially an open-ended multi-tiered Architecture

Sub-Module:

Using Web Services in Practice

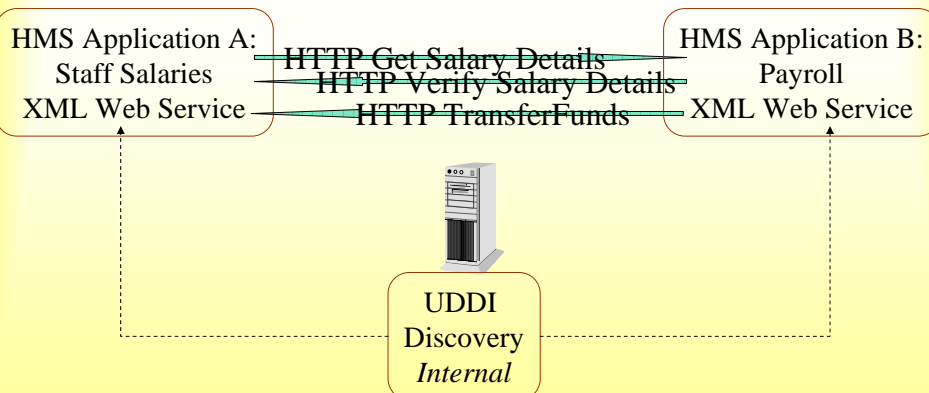
Usage with .NET

Automating Web Services using .NET



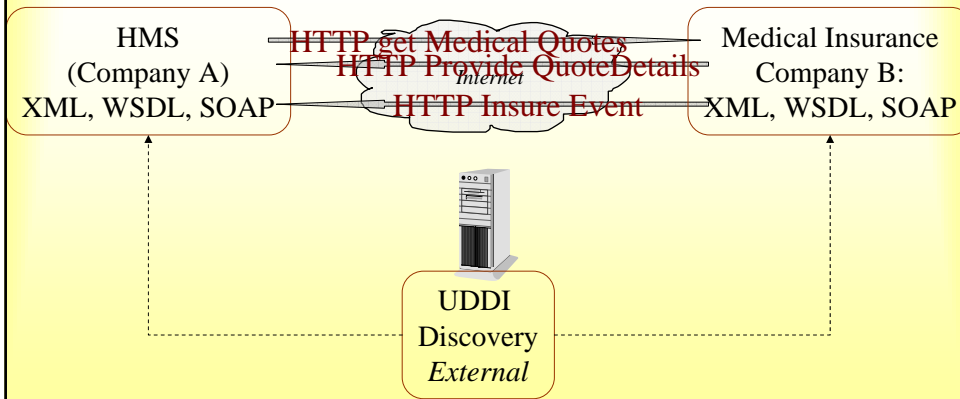
Visual Studio.net

Enterprise Application Integration (Within an Organization)



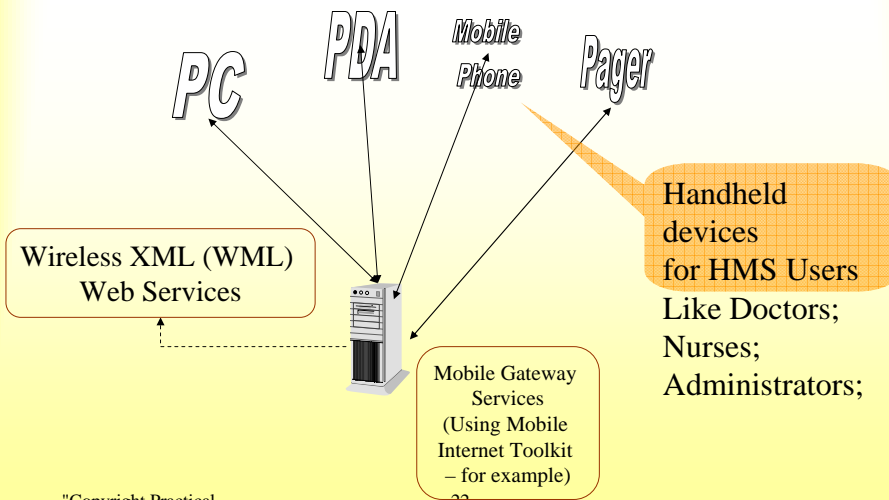
Business to Business

(Outside the Organization, with another Organization and its Applications)



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WML - XML Web Services for Mobile Devices



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Conclusions

- Discussed Emerging Technologies
 - ✓ Importance of Modelling Web Services
- ✓ XML/SOAP; WSDL; UDDI;
- Model Driven Architecture
- Applying Web Services in Practice
 - Including Mobile Applications



PROJECT WORK : (DURING TUTORIALS IN THE LAB);

**Follow the Project Work Requirements
given at the End of the Chapter;
Discuss Project Work with Team
Members and Tutor;
Carry Out the Project Work**