

## Plenary Lecturer I

# Web services: models, equivalence transformations, frameworks, implementations

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### Abstract

Until recently, data has been exported on the World Wide Web for human consumption in the form of Web pages. Most people therefore use the Web to read news/articles, to buy goods and services, to manage on-line accounts and so on. For this purpose, we use a Web browser and access information mostly through this medium.

From a publishing perspective, this involves converting the raw information, from a database, for example, into HTML or similar language so that it can be rendered in the correct form. Further, many Web sites collate information from other sites via Web pages, which is a bizarre occurrence involving decoding and parsing human-readable information not intended for machines at all.

This scenario works well for many applications but it is highly redundant because the conversion from the raw data into human-readable format for publication and availability does not support software interactions very well. What we really need to do is provide a mechanism whereby the raw data can be accessed in a similar fashion by machines as humans read Web pages now. Therefore, some special smart (usually standalone) client mechanism is required in order to enable true machine-to-machine communication to provide a machine-process able Web.

In the last ten years, three models of **web services** were studied: XML-RPC model, SOAP (+ WSDL and UDDI) model, REST (RESTfully) model. In our paper, the definitions and characteristics of each model are presented. The main our focuses are:

1. Internet resources and web applications: resource representations (XHTML, XML, JSON), transport : HTTP protocol, HTTP request methods (GET, POST, PUT, DELETE, HEAD), General Architecture of a web application, AJAX.
2. Middleware: RPC & MOM, RPC paradigms, Java servlets, RMI (+IIOP), CORBA, Pyro, Hessian, JMS.
3. Web service: What is? An example, WS types: XML-RPC, SOAP (with WSDL & UDDI), RESTful, Asynchronous WS: GWT
4. WS models, implementations, frameworks: XML-RPC: C# (XmlRpcCS), Java (Apache XML-RPC), PHP (Dumbill xmlrpc[s].inc), Python (xmlrpclib, SimpleXMLRPCServer), SOAP (+ WSDL, +UDDI): C# (.NET +IIS + \*.asmx), Java (Apache JAX-WS), PHP (nusoap, SoapServer, SoapClient), Python (jpk/SoapLib, python-suds), RESTful: C# ((.NET +IIS + \*.ashx), Java (Jboss RESTeasy), PHP (Da Silva packages), Python (CherryPy), Asynchronous WS: GWT Java (+ JavaScript automatically translated from Java code)
5. Our purpose for integration and transformations: WSWrapper

**Brief Biography of the Speaker:** Florian M.Boian is a Professor of Faculty of Mathematics of Cluj-Napoca from 1997. Since 1995 he is the Director of the Communication Center of "Babes-Bolyai" University of Cluj-Napoca. The scientific activity is mirrored in the published papers. Statistically, this activity resumes to the following: over 12 books printed at several publishing houses; over 38 courses, workbooks and various documentation published by the University, alone or in collectives; over 78 papers published in specialty magazines, at various conferences and congresses; over 82 scientific communications; participated in over 39 research partnerships, grants and which elaborated alone or 22 important IT products; over 34 times participation to local, national or international scientific manifestations. The research domains are oriented in three directions: Algorithms and Distributed Programming: formal models, concurrent and distributed computing paradigms, client-server mechanisms; Distributed Operating Systems: distributed architectures, concurrent processes, models of specifying concurrency, models of file systems, mechanisms of message sending, protection and security; Internet communications: communication infrastructures, resource development, and online services. Other activities: Member of Editorial Advisory Board for: "International Journal of Intelligent Computing & Information Science", Ain Shams University, Cairo, Egypt; Co-president of the "Teaching Center Cluj"; Member of the National Education Internet Committee; CNCSIS expert for annual grants and World Bank.