
มหาวิทยาลัยขอนแก่น
KHON KAEN UNIVERSITY
SOA, Web 2.0, and Web Services
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1. Media Tablets and Beyond
   - Facing and managing APIs to access enterprise information and systems
   - Integration with third-party applications
   - Integration with various partners for capabilities such as search and social networking, and delivery through app stores

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2. Mobile-Centric Applications and Interfaces
   - The user interface (IU) paradigm in place for more than 20 years is changing
   - UIs with windows, icons, menus, and pointers will be replaced by
   - Mobile-centric interfaces emphasizing touch, gesture, search, voice, and video

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2. Mobile-Centric Applications and Interfaces (Cont.)

- HTML5 will also provide a long term model to address some of the cross-platform issues
- By 2015, half of the apps that would be written as native apps in 2011 will instead be delivered as Web apps

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3. Contextual and Social User Experience

- A contextually aware system anticipates the user's needs and proactively serves up the most appropriate and customized content, product, or service
- Context can be used to link mobile, social, location, payment, and commerce

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3. Contextual and Social User Experience (Cont.)

- It can help build skills in augmented reality, model-driven security and ensemble applications
- Applications are in targeted areas such as location-based services, augmented reality on mobile devices, and mobile commerce

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4. Internet of Things (IoT)

- The Internet of Things (IoT) is a concept that describes how the Internet will expand as sensors and intelligence are added to physical items such as consumer devices that are connected to the Internet
- Technologies for identifying, sensing, and communicating

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4. Internet of Things (IoT) (Cont.)

- Embedded sensors: sensors that detect and communicate changes
- Image recognition: Strive to identify objects, people, buildings, logos
- Near Field Communication (NFC) payment; NFC allows users to payments by waving their mobile phone in front of a compatible reader

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5. App Stores and Marketplaces

- By 2014, there will be more than 70 billion mobile application downloads from app stores every year
- With enterprise app stores, the role of IT shifts from that of a centralized planner to a market manager to providing governance and brokerage services to users and potentially an ecosystem to support entreprenurs

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6. Next-Generation Analytics

- Analytics is growing along three key dimensions
  - From traditional offline analytics to in-line embedded analytics
  - From analyzing historical data to explain what happened to analyzing historical and real-time data from multiple systems to simulate and predict the future

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6. Next-Generation Analytics (Cont.)

- From structured and simple data analyzed by individuals to
- Analysis of complex information of many types (text, video, etc…) from many systems supporting a collaborative decision process that brings multiple people together to analyze, brainstorm, and make decisions

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7. Big Data

- The size, complexity of formats and speed of delivery exceeds the capabilities of traditional data management technologies
- Analytics has become a major driving application for data warehousing, with the use of MapReduce outside and inside the dBMS

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8. In-Memory Computing

- Gartner sees huge use of flash memory in consumer devices, entertainment equipment and other embedded IT systems
- Besides delivering a new storage tier, the availability of large amounts of memory is driving new application models

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9.Extreme Low-Energy Servers

- The systems are built on low-power processors typically used in mobile devices
- The new approach is well suited for certain non-compute intensive tasks such as map/reduce workloads or delivery of static objects to a website

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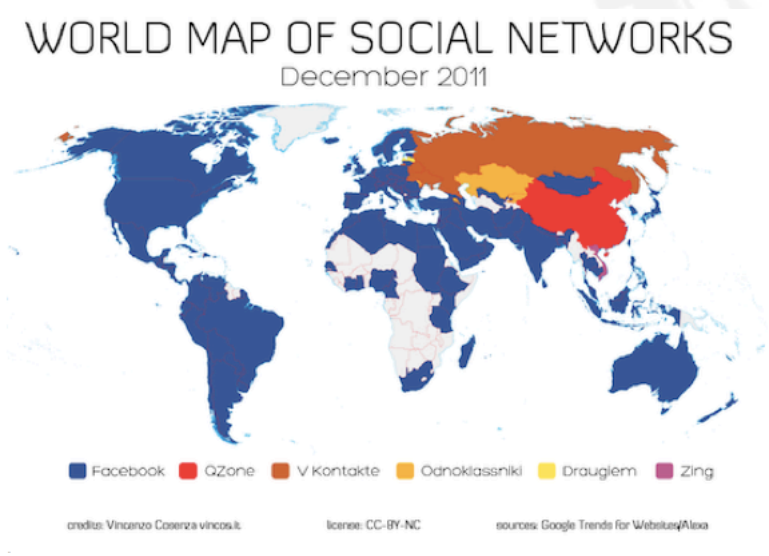
10. Cloud Computing

- Cloud is a disruptive force and has the potential for broad long-term impact in most industries
- Enterprises are moving from trying to understand the cloud to making decisions on selected workloads to implement on cloud services and where they need to build out private clouds

Gartner Predictions in 2010

- By 2012, Facebook will become the hub for social networks integration and Web socialization
- By 2013, mobile phones will overtake PCs as the most common Web access device worldwide
- By 2015, more than three billion of population will be able to transact electronically via mobile and Internet technology

#1 in 127 out of 136 countries



Smart phones overtake client PCs in 2011

Worldwide smart phone and client PC shipments
Shipments and growth rates by category, Q4 2011 and full year 2011

Category	Q4 2011 shipments (millions)	Growth Q4'11/Q4'10	Full year 2011 shipments (millions)	Growth 2011/2010
Smart phones	158.5	56.6%	487.7	62.7%
Total client PCs	120.2	16.3%	414.6	14.8%
- Pads	26.5	186.2%	63.2	274.2%
- Netbooks	6.7	-32.4%	29.4	-25.3%
- Notebooks	57.9	7.3%	209.6	7.5%
- Desktops	29.1	-3.6%	112.4	2.3%

Source: Canalys estimates © Canalys 2012

Android and iOS are the Top Platforms

Worldwide smart phone market
Shipments by platform, Q4 2011

Platform	Q4 2011 shipments (millions)	Share (%)	Growth Q4'11/Q4'10
Total	158.5	100.0%	56.6%
Android	81.9	51.6%	148.7%
iOS	37.0	23.4%	128.1%
Symbian	18.3	11.6%	-40.9%
BlackBerry	13.2	8.3%	-9.7%
bada	3.8	2.4%	39.1%
Windows Phone	2.5	1.6%	-14.0%
Others	1.8	1.1%	117.9%

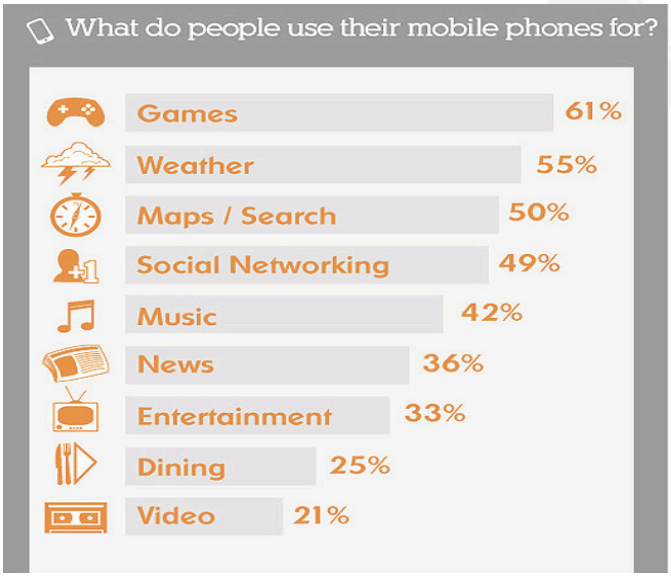
Source: Canalys estimates © Canalys 2012

Worldwide smart phone market
Shipments by platform, full year 2011

Platform	Full year 2011 shipments	Share (%)	Growth Q4'11/Q4'10
Total	487.7	100.0%	62.7%
Android	237.8	48.8%	244.1%
iOS	93.1	19.1%	96.0%
Symbian	80.1	16.4%	-29.1%
BlackBerry	51.4	10.5%	5.0%
bada	13.2	2.7%	183.1%
Windows Phone	6.8	1.4%	-43.3%
Others	5.4	1.1%	14.4%

Source: Canalys estimates © Canalys 2012

Top Mobile Apps Categories



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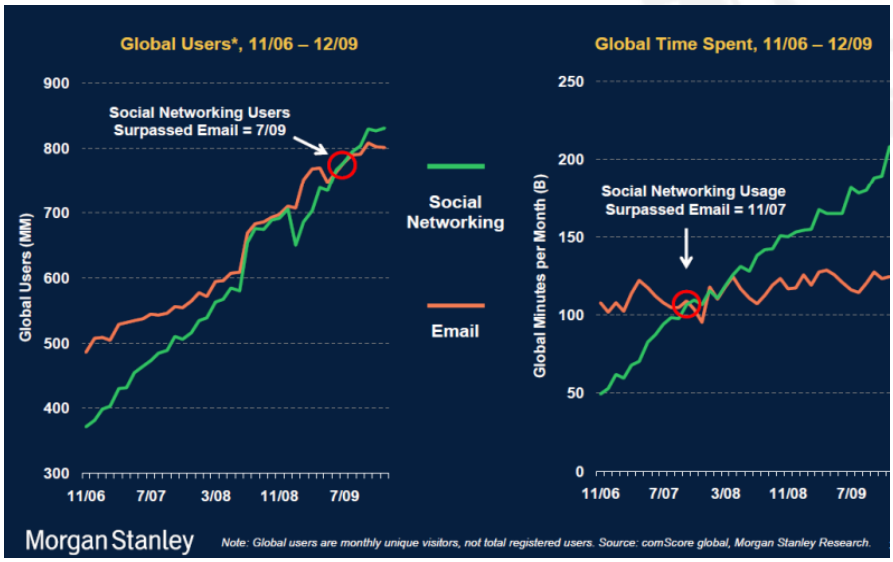
Gartner Predictions in 2011

- By 2012, large enterprises will have a dynamic sourcing team that is responsible for ongoing cloud sourcing decisions and management
- By 2013, more than 25 percent of the content that workers see in a day will be dominated by pictures, video, or audio
- By 2016, one-third of worldwide mobile consumer marketing will be context-awareness-based

Social Networking > Emails Usage



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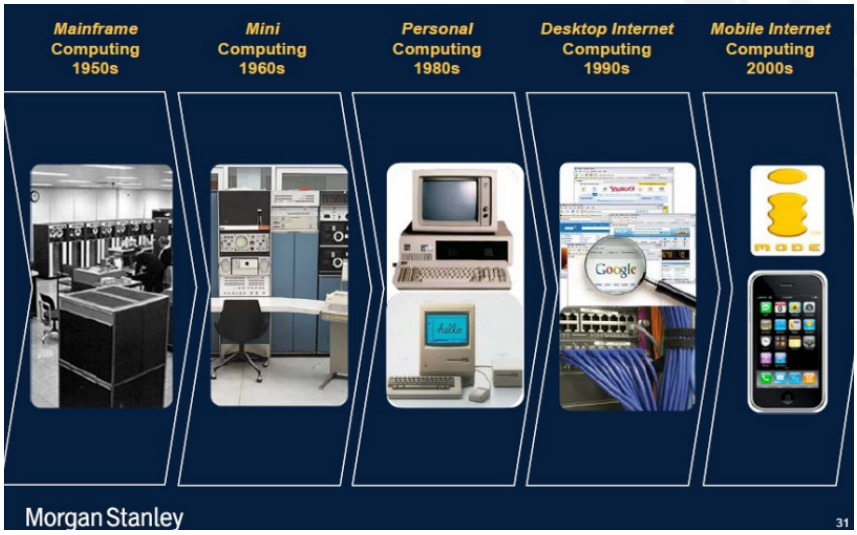
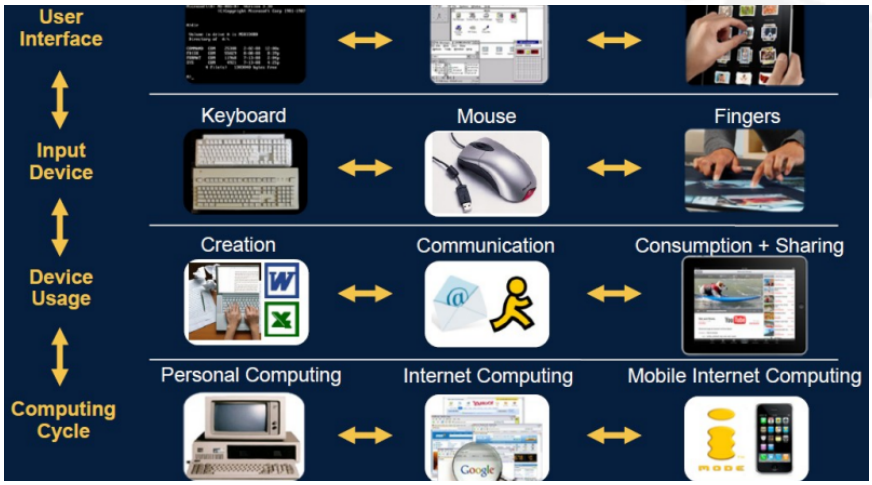
New Communications Platform

Evolutions of Computing Cycles



User Interface + Device Usage Evolution

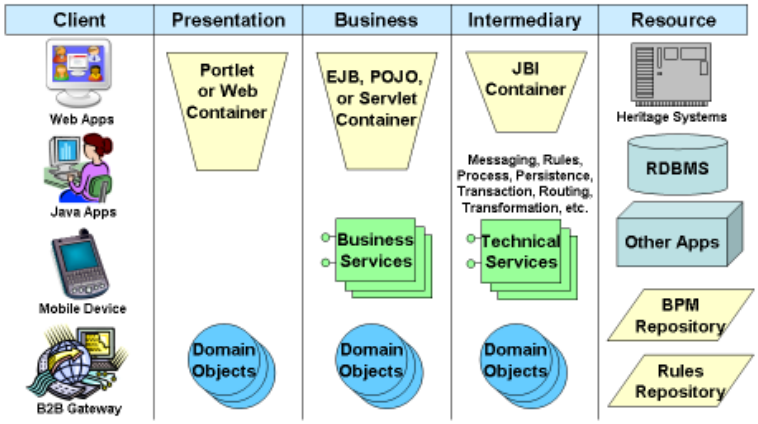


SOA Definition

- SOA is an architectural style whose goal is to achieve loose coupling among interacting software agents
- As we build more software systems, we see similar situations and patterns
- Naturally, we want to reuse the functionality of existing systems rather than building them from scratch

SOA Tiers and Components

Logical SOA Tiers and Components



Full Service-Oriented Architecture

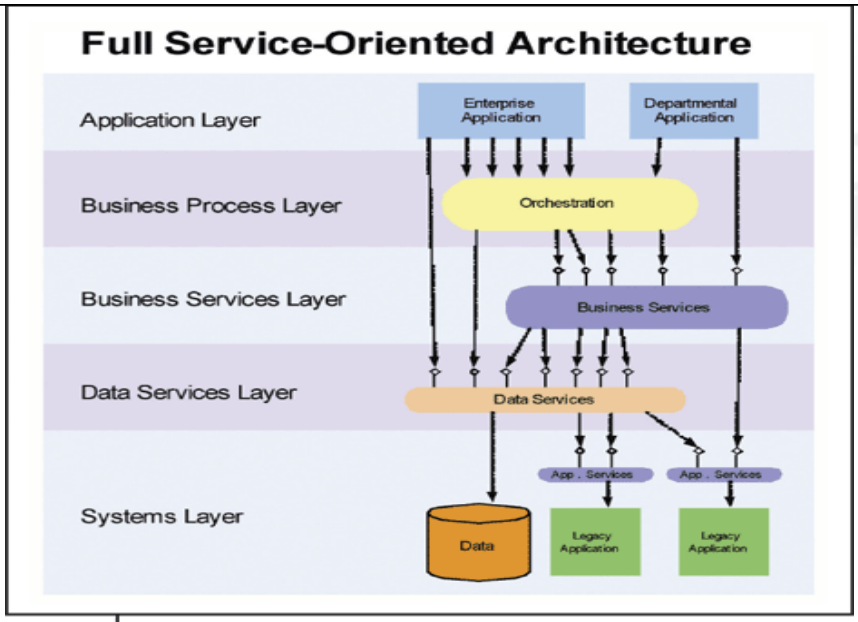


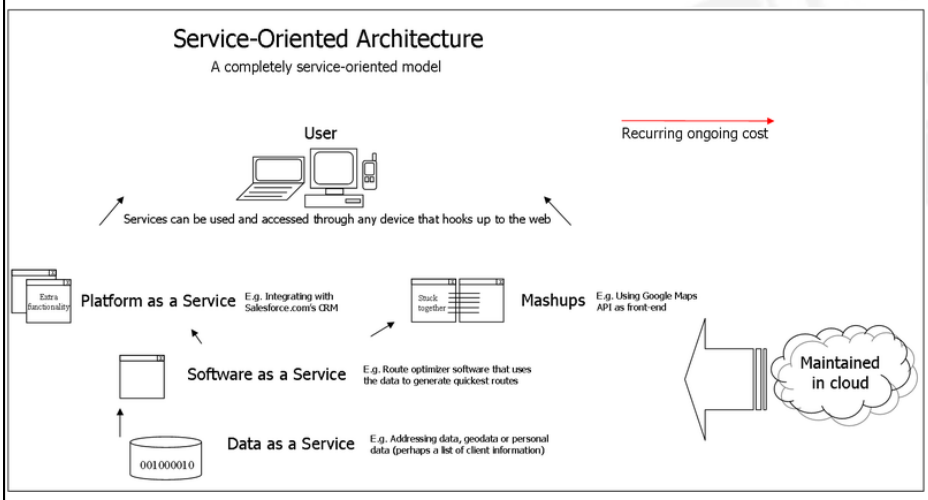
FIGURE 2 **Classic view of a robust SOA**

Service Definition

- A service is a unit of work done by a service provider to achieve desired end results for a service consumer
- Consuming a service is usually cheaper and more effective than doing the work ourselves
- Both provider and consumer are roles played by software agents on behalf of their owners
  - An agent is a program acting on behalf of a person or organization

Deriving Web Services from SOA

- A Web service is a SOA with at least the following additional constraints
  - Interfaces must be based on Internet protocols such as HTTP, FTP, and SMTP
  - Except for binary data attachment, messages must be in XML



Source: http://thewebserviceblog.co.uk/

What is Web 2.0?

- Web 2.0 describes Web experiences that fundamentally engage users by
  - Allow them to participate in sharing information and enriching data freely
  - Readily offering their core functionality as open services to be composited or "mashed up" into new services and sites
  - Placing the Web at the center of the software experience both in terms of data location as well as where the software is

Web 2.0 Architecture

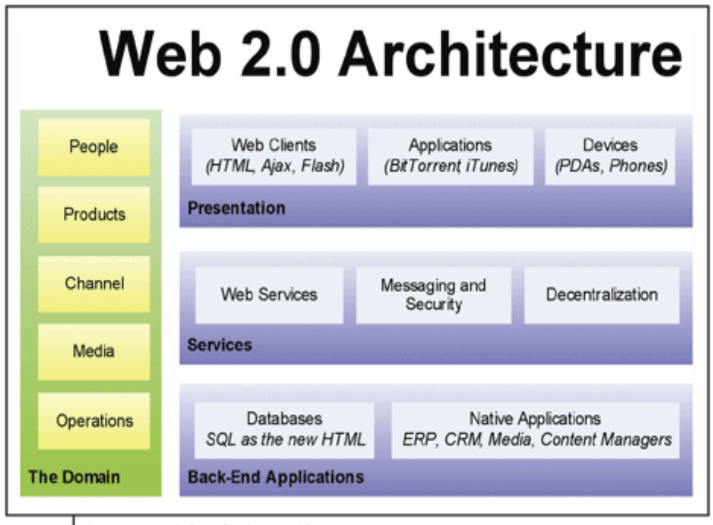


FIGURE 1 | One conceptual view of Web 2.0 architecture

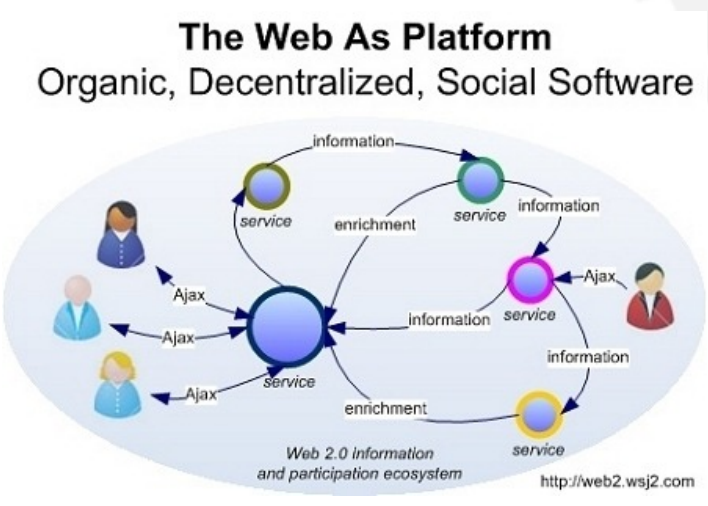
Web 2.0 Characteristics

- Tim O'Reilly provides seven classic characteristics of Web 2.0 software
  - Web as platform
  - Harnessing collective intelligence
  - Data is the next Intel inside
  - End of the software release cycle
  - Lightweight programming models
  - Software above the level of a single device
  - Rich user experience

The Web as Platform

- Software and services are now the same thing
- The Web has become a computing platform in its own right
- The Web is where most software is moving for cost, convenience, agility, and increased overall value

The Web as Platform



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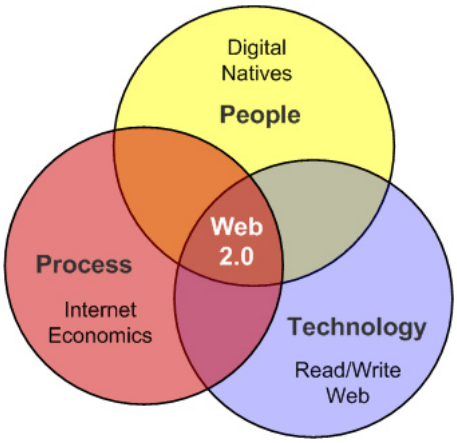
Harnessing Collective Intelligence

- The network effects of massive amounts of users make the collaborative Web a much more potent force than stand-alone software
- Online collaborative entities such as Wikepedia are a network effect of the combined contributions of their users
  - Classic example of Web 2.0

Data is the Next Intel Inside

- The core functionality of many modern information systems is not software
- It's the valuable data within the system that is actually more important
  - Google's search database
  - Amazon's products and associated reviews
- The data these sites posses are their real assets

Need People, Technology, and Process



End of the Software Release Cycle

- When software is on the Web, upgrading becomes a different experience
- Upgrades and improvements to service are instantly available and encouraged to be as nondisruptive as possible

Lightweight Programming Models

- When the clients of Web software are numerous and diverse
  - Complex standards can get in the way
- Web 2.0 leverages the easiest methods that work well
  - Lead to simpler services such as REST and RSS instead of SOAP and WS-* standards

Software Above the Level of a Single Device

- PCs are an increasingly smaller aspect of the Web
- With so many different devices such as mobile phones, PDAs, and even digital video recorders becoming connected to the Web
  - Providing and consuming functionality and connectivity
- The software as a Service landscape of the Web now includes these in the picture

Rich User Experiences

- The Web has ceased to be about static Web pages
- They still exist, but they are much less important
- The AJAX browser application model is famously a Web 2.0 technique
  - Provide the full interactive experience of native applications to the user
  - Leveraging XML Web services on the backend to provide access to data and services

Comparison of Web 2.0 and SOA Concepts

	Web 2.0	SOA
Service Model	Web services	Web services
Perferred Service Standards	HTTP, XML, RSS, REST	WSDL, UDDI, SOAP, BPEL, WS-*

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Comparison of Web 2.0 and SOA Concepts

	Web 2.0	SOA
Composition Mechanisms	Web server aggregation (remixing, mash-ups)	Orchestration, coordination, service wrapping
Reusability	Yes, very	Yes, somewhat
User Interface	Yes, explicit with AJAX and emphasis on RIAs	No, implicit

Comparison of Web 2.0 and SOA Concepts

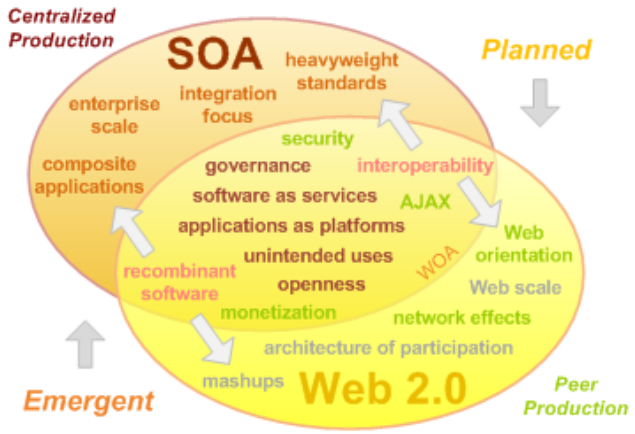
	Web 2.0	SOA
Architectural Principles	Participation Loose Coupling Reusability Personalization	Service Contracts Interface First Design Loose Coupling Discoverability

Comparison of Web 2.0 and SOA Concepts

	Web 2.0	SOA
Core Competencies	▪Software as a Service, ▪Control over data sources ▪Trusting users as co-developers ▪Harnessing collective intelligence	▪Functional encapsulation ▪Data as an asset ▪System and data integration ▪B2B self-service ▪Open standards

SOA and Web 2.0

The Two Top-Level Organizing Principles in Modern Software Continue to Converge



SOA vs. Web 2.0

- What SOA and Web 2.0 Shares
  - Open access via standards.
  - Embrace Web services
  - Encourage composition and reuse
- What SOA and Web 2.0 Differs
  - SOA usually has a more complex, hard-wired service model
  - Web 2.0 encourages simpler, malleable forms with clear overlap in the middle.

How Web 2.0 and SOA Complete Each Other

- Web 2.0 emphasizes a social aspect that SOA is completely missing
  - Web 2.0 talks about presentation and the front end is displayed to the user
  - SOA is largely silent on the issue of presentation, though it admits its existence
- SOA has much more central configuration control while Web 2.0 has no command and control structure

Conclusion

- Many important technologies involve the invocation and the implementation of Web services
  - SOA
  - Web 2.0
  - Mobile apps
  - Social networking apps
  - Cloud computing