

RICH INTERNET APPLICATIONS

Chapter 1: Introduction

Mashup:

- The term "mashup" has several meanings.
- It was originally used to describe songs that meshed two different styles of music into one song.
- For ex, a classic rock song put to a well-known hip-hop beat may be considered a mashup.
- It is also used to describe videos that have been compiled using different clips from multiple sources.
- For ex, a skateboarding movie created from several different skateboard videos found would be considered a video mashup.

- A mashup also describes a [Web](#) application that combines multiple services into a single application.
- For ex, a Web forum may contain a mashup that uses [Google](#) Maps to display what parts of the world the users are posting from.
- [Yahoo](#) offers a mashup called Yahoo! Pipes that aggregates [RSS](#) (originally RDF Site Summary, often dubbed Really Simple Syndication) feeds into a single page that can be navigated using a graphical interface.
- The primary purpose of most Web mashups is to consolidate information with an easy-to-use interface.

Mashup (web application hybrid)

- In [Web development](#), a **mashup** is a [Web page](#) or application that uses and combines data, presentation or functionality from two or more sources to create new services.
- The term implies easy, fast integration, frequently using [open APIs](#) and data sources to produce better results.

- The main characteristics of the mashup are
 - i. combination,
 - ii. visualization, and
 - iii. aggregation.
- It is important to make existing data more useful, moreover for personal and professional use.

Types of mashups

- There are many types of mashups:
 - i. business mashups,
 - ii. consumer mashups, and
 - iii. data mashups.
- The most common type of mashup is the consumer mashup, aimed at the general public.

Business (or enterprise) mashups:

- They generally define applications that combine their own resources, application and data, with other external [Web services](#).
- They focus data into a single presentation and allow for collaborative action among businesses and developers.
- This works well for an [agile development](#) project, which requires collaboration between the developers and customer for defining and implementing the business requirements.
- Agile development is a style of software development that emphasizes customer satisfaction through continuous delivery of functional software.
- Enterprise mashups are secure, visually rich Web applications that expose actionable information from diverse internal and external information sources.

Consumer mashups:

- They combines **different data types**.
- It combines data from multiple public sources in the browser and organizes it through a simple browser user interface.

e.g.: [Wikipediavision](#) combines Google Map and a Wikipedia API

Data mashups:

- *Data mashups*, opposite to the consumer mashups, combine **similar types** of media and information from multiple sources into a single representation.
- The combination of all these resources create a new and distinct Web service that was not originally provided by either source.

Categorized by API type:

- Mashups can also be categorized by the basic API type they use but any of these can be combined with each other or embedded into other applications.

Architectural aspects of mashups

- The architecture of a mashup is divided into three layers:
 - i. Presentation / [user interaction](#)
 - ii. Web Services
 - iii. Data
- **Presentation / user interaction:**

This is the user interface of mashups. The technologies used are HTML/XHTML, CSS, Javascript, Asynchronous [Javascript and Xml \(Ajax\)](#).
- **Web Services:**

The products functionality can be accessed using the API services. The technologies used are [XMLHttpRequest](#), [XML-RPC](#), [JSON-RPC](#) (JavaScript Object Notation-Remote Procedure Call), [SOAP](#) (Simple Object Access Protocol), [REST](#) (Representational State Transfer).
- **Data:**

Handling the data like sending, storing and receiving. The technologies used are [XML](#), [JSON](#), [KML](#) (Keyhole Markup Language).

A simple picture of Web Evolution

- **Web 1.0**, is a **Read-or-Write Web**.
- In particular, authors of web pages write down what they want to share and then publish it online.
- Web readers can watch these web pages and subjectively comprehend the meanings.
- Unless writers willingly release their contact information in their web pages, the link between writers and readers is generally disconnected on Web 1.0.
- In short, Web 1.0 connects people to a public, shared environment --- World Wide Web.
- **But Web 1.0 essential does not facilitate direct communication between web readers and writers.**

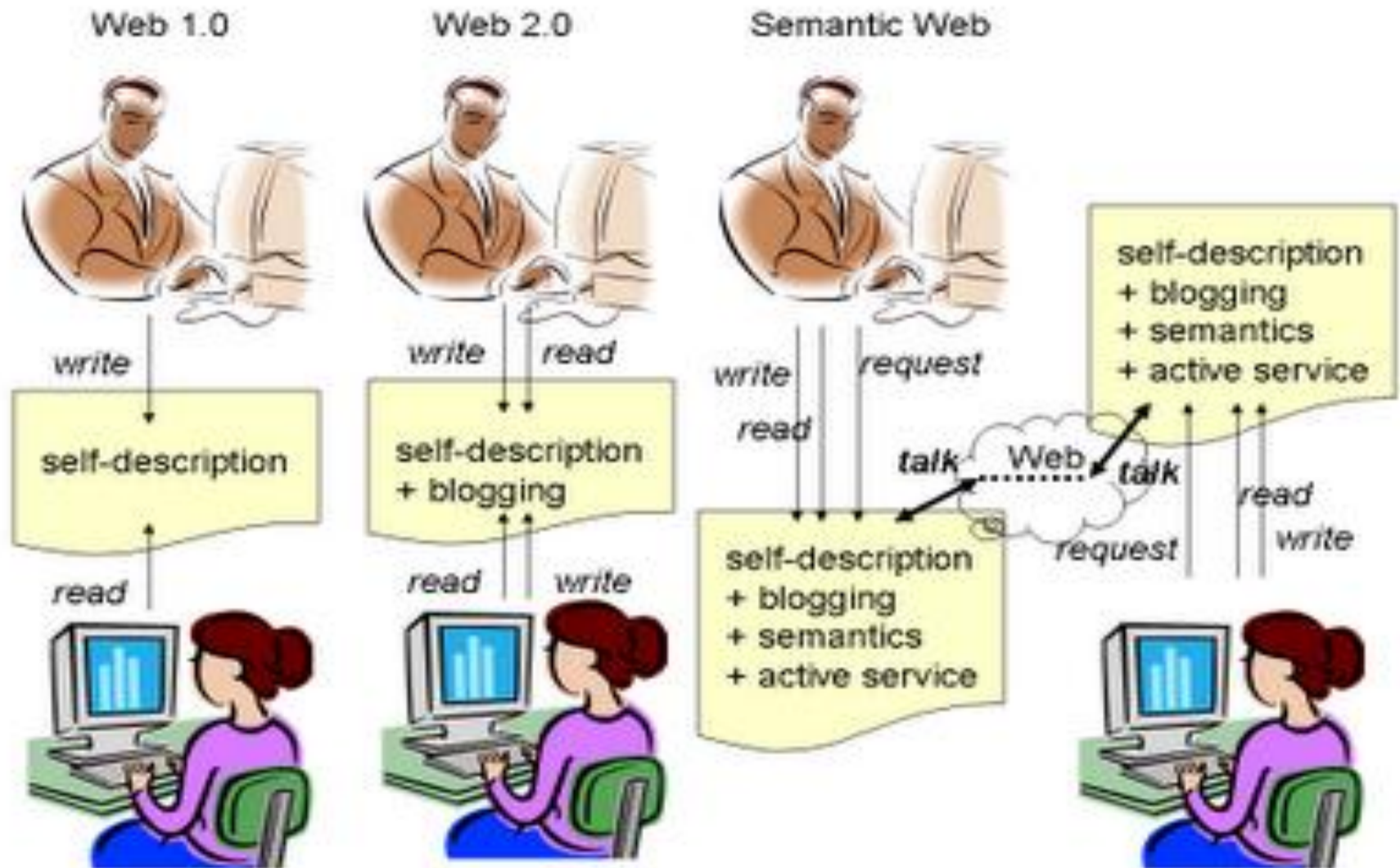


Image from Thinking Space by Yihong Ding

Figure 1.1 Simple abstraction of web evolution

A simple picture of Web Evolution (Contd..)

- **Web 2.0**, not only writers but also readers can both read and write to a same [web space](#).
- This advance allows establishing friendly social communication among web users without obligated disclosure of private identities.
- Hence it significantly increases the participating interest of web users.
- Normal web readers (not necessarily being a standard web author simultaneously) then have a handy way of telling their viewpoints without the need of disclosing who they are.
- The link between web readers and writers becomes generally connected.
- In short, Web 2.0 not only connects individual users to the Web, but also connects these individual users together.

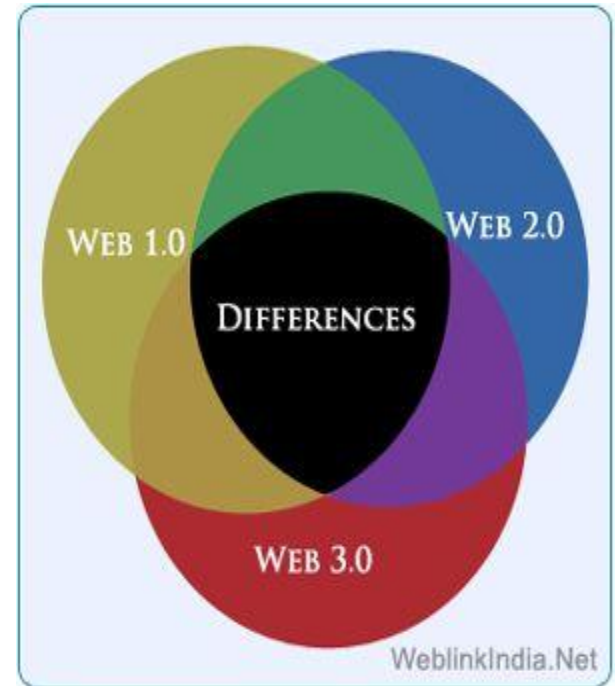
A simple picture of Web Evolution (Contd..)

- In summary, Web 1.0 connects real people **to the World Wide Web.**
- Web 2.0 connects real people **who use the World Wide Web.**
- The future semantic web, however, will connect **virtual representatives of real people** who use the World Wide Web.

The Basic Differences

Web 1.0 :

- Web 1.0, or web, is a stage of the World Wide Web, linking Web Pages with hyperlinks.
- The only feature of Web 1.0 was “**to read**”. The shopping cart application comes under the category of Web 1.0.
- Shopping cart applications is widely used in e-commerce to assist people with online purchasing. This version of web widens the exposure for online service providers and users, removing all geographical restrictions.



Web 2.0 :

- Berners-Lee describes Web 2.0 as a “**read-write**” web.
- This idea was introduced in 1999, to contribute content and interaction with other web users.
- Earlier, the users wanted to get more involved in the information provided to them.
- Hence, it satisfied the reading, writing and publishing needs of users through **live-journals and blogging**.
- The dramatic shift from Web 1.0 to Web 2.0 can be interpreted as a result of drastic advancement in technology.
- This change in technology included broadband, improved browsers, AJAX, rise of Flickr, YouTube, Facebook and other interactive and innovative websites.

Web 3.0 :

- Web 3.0, as an extension of web 2.0 evolved by adding one more feature to read and write, that is '**Execution**'.
- This is all about Semantic Web, personalization (iGoogle- allows to create personalized Home Page with Google Search Box at the Top), intelligent search & behavioral advertising among other things.
- Berners- Lee explained it in simpler terms by referring it as **semantic markup and web services**.
- Semantic markup refers to the communication gap between **human, web users and computerized applications**.
- Through Web 3.0, data can be filled in a form that is accessible to humans through natural language and can be interpreted by software applications easily.

Differences between Web 1.0 & Web 2.0

S.No	Web 1.0	Web 2.0
1	Read-Only Web	Read-Write Web
2	45 million global users(1996)	1 Billion + Global Users (2006)
3	Focused on companies	Focused on communities
4	Home Pages	Blogs
5	Owning Content	Sharing Content
6	Britannica Online	Wikipedia
7	HTML Portals	XML, RSS
8	Web Forms	Web Applications
9	Directories(Taxonomy-Classification according to predefined system, with resulting catalog used to provide a conceptual framework)	Tagging (Folksonomy)
10	Netscape	Google
11	Page Views	Cost Per Click
12	Advertising	Word of Mouth

Differences between Web 2.0 & Web 3.0

S.No	Web 2.0	Web 3.0
1	Widely Read-Write Web	Portable Personal Web
2	Focused on communities	Focused on the individual
3	Blogs	Life Stream (Online/Offline activities)
4	Sharing Content	Consolidating dynamic Content
5	XML, RSS	Semantic Web
6	Web Applications	Widgets, drag & drop Mashups
7	Tagging (Folksonomy)	User Behavior (me-anomy)
8	Google	iGoogle, NetVibes
9	Cost Per Click	User Engagement

Traditional Thinking?

- Forklift approach demanded a huge investment up front and, of course, venture capitalists were quite happy to oblige.
- Many company got their start this way, & huge amounts of venture capital were blown through before dollar one was ever earned. This continued for a number of years (the “salad days”, as they say), & then the roof caved in.
- In recent years, the entrepreneurial spirit of the Internet has been rekindled, and smart companies are taking small, gradual steps into new and unconventional business directions. The result is what’s commonly referred to as Web 2.0.

Folksonomies

- It's a process whereby a group of people collaborate to organize information using an impromptu vocabulary. This can happen anywhere and it can be either implicit or explicit.
- It's a system of classification derived from the practice and method of collaboratively creating and managing tags to annotate and categorize content.
- This practice is also known as **collaborative tagging, social classification, social indexing, and social tagging**.
- It is the result of personal free tagging of information and objects (anything with a URL) for one's own retrieval. The tagging is done in a social environment (shared and open to others). The act of tagging is done by the person consuming the information.

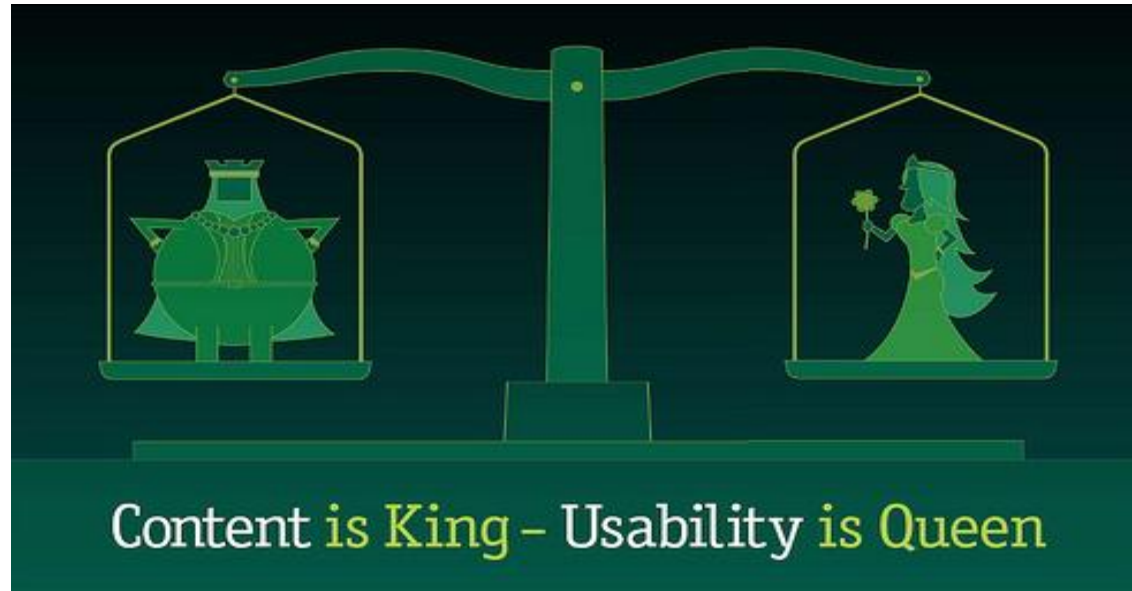
How do Folksonomies apply to Web 2.0?

- In the Web 2.0 world, there is a huge amount of information and it's updated constantly.
- Who better to categorize data than the people closest to it? You've probably participated in folksonomies already without even realizing it.
- Amazon now allows users to tag products with keywords. These are words of the customer's choosing and can be completely arbitrary.
- Overtime, this will evolve into its own folksonomy whereby the users are adding value for other users by using the amazon site.

Software as a Service (SaaS)

- Web 1.0 consisted of human sitting behind a browser.
- Web 2.0 is about exposing a rich functionality set and much more data.
- Data is generally accessible to both humans and machines, leading to more automation and derived applications than ever before.
- In “old days”, a company would create a service and then package it up in a Web site & publish it out on the Internet.
- Pre-packages mechanism was followed to access that functionality which is implemented by the company, usually its Web site.

Data Is King



- Content can mean any creative work, such as text, graphics, images or video.
- Allowing the users to consume data makes it possible to define an entirely new business model and functionality other than those that were originally intended.
- Independent developers are now capable of delivering applications that would be impossible without a large team of resources.

Data Is King (contd...)

- For ex: developers have combined **Google Maps** with numerous other sources of information to build new and useful applications.
- It would be very difficult for an individual developer to gather satellite images of the world, or a street map of the entire United States. Yet, Google gives this data away for free.

Convergence

- **Technological convergence** is the tendency for different technological systems to evolve towards performing similar tasks.
- Convergence can refer to previously separate technologies such as voice (and telephony features), data (and productivity applications), and video that now share resources and interact with each other synergistically.

- Applications are diverging from the desktop and being accessed from various devices.
- The next logical step will be a convergence whereby these various access channels become integrated.
- A personal media center is basically a television hooked up to a computer.
- You can **view and record television** without the use of tapes. You can view an enhanced programming guide with links out to Internet content.
- You can view RSS & news headlines on this PC viewing them as television, & so on.

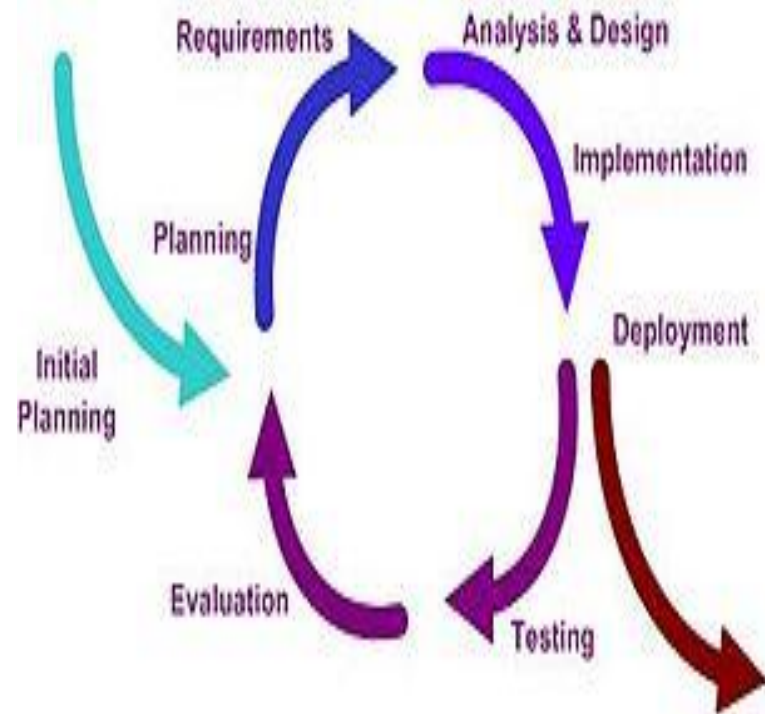
- By integrating additional devices into media center, new usage scenarios are enabled.

For Ex: Imagine taking a phone call by pausing live television and broadcasting the audio over your 5.1 stereo system.

- Television display might show caller ID, combined with a photo of the caller.
- Finally the entire call could be recorded for your records, synched with your MP3 player, & published to a personal blog using RSS.

Iterative Development

- Web 2.0 companies tend to operate in very short cycles of plan, design, develop, launch, get feedback, repeat.
- This means time to market is reduced.
- Companies purposefully leave features out to achieve shorter cycle times.
- Rather than guess at what the users want, it's better to **launch a small subset of functionality** and then take real-world users feedback.
- The feedback is then used to drive feature definition in subsequent cycles.



- This constant loop of development & product releases is commonly referred to as perpetual beta.
- Rather than delivering a finished product, the application is never complete. Its constantly being iterated on and refined.
- By shipping functionality early and more often, a company's projections and estimates become more accurate.
- The gap between users needs and projects requirements is lessened
- The value to the users is that they get an application that doesn't attempt to solve all their problems, but just some of their problems extremely

Rich Browser Experience

- Browser is traditional interface to the Internet.
- Pages need time to load.
- Data is **static** in the browser until it is **refreshed**.
- Arrival of faster Internet access, improved JavaScript support, & the proliferation of Web services have made a rich browser experience possible.
- **Ajax** is usually top-of-mind whenever anyone mentions **Web 2.0** or rich browser experiences.
- Ajax provides the ability to communicate asynchronously with a Web server while a page is being viewed in a browser.

Rich Browser Experience (Contd...)

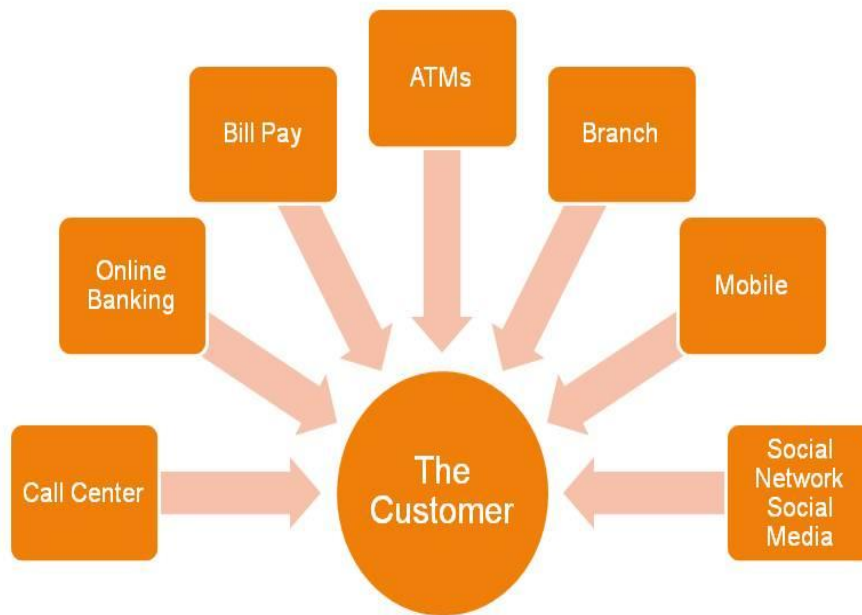
- Using Ajax, you can perform **partial page updates** so that data is kept fresh, even if the user doesn't refresh the page.
- JSON(JavaScript Object Notation), when combined with some clever JavaScript, can also be used to **dynamically update a page's content**.
- Regardless of what rich Internet Application (RIA) features a site might implement, the experience is ultimately more important than the technology.

Multiple Delivery Channels

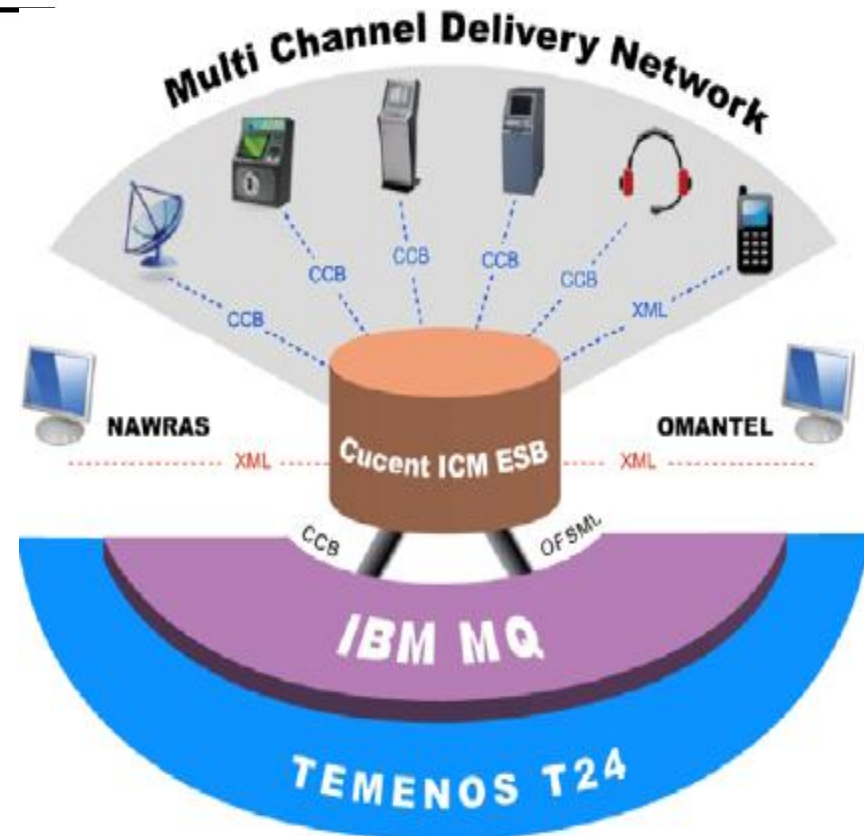
- Most applications start out as Web application-accessible via a standard browser on a desktop or laptop.
- With the advent of broadly available Internet access via **Wi-Fi (now Bluetooth)**, application functionality is now being delivered more and more through **cellular telephones and wireless devices** such as the Pocket PC or Palm.
- Increasingly, people want to consume content via the delivery channel of their choice: email, newsletters, via RSS readers, on Web sites and on their mobile devices.
- Because content is centrally managed and highly portable, it can be published to any channel with very little time and effort.
- **“Write once, distribute many times.”**

Multiple Delivery Channels (Contd...)

Channels Speaking to the Retail Bank's Customer



Source: Mercator Advisory Group



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Social Networking

- A **social networking service** is an [online service](#), platform, or site that focuses on building and reflecting of [social networks](#) or [social relations](#) among people, who, for example, share interests and/or activities.
- A social network service consists of a representation of each user (often a profile), his/her social links, and a variety of additional services.
- People attend parties without knowing many of them but they leave the party with a series of new business contacts.
- Sites such as MySpace, YouTube, & Flickr allow users to create their own personalized areas free of charge and publish content to the same.
- This was possible in the Web 1.0 too , but not to the same level of sophistication.
- Bloggers link to other bloggers, & reputations are born.

Social Networking (Contd...)

- Slowly, a community of real people forms around a given topic. In this manner, the leap is made from a set of technologies such as HTML, HTTP, XML & so on to a living, breathing community that enhances people's lives through a sense of belonging.
- The main types of social networking services are those that contain category places (such as former school year or classmates), means to connect with friends (usually with self-description pages), and a recommendation system linked to trust.
- Popular methods now combine many of these, with [Facebook](#), [Google+](#) and [Twitter](#) widely used worldwide
- This is a **list of** major active [social networking websites](#) and excludes dating websites.

Name	Description/Focus	Date launched	<u>Registered</u> users	Registration	Global Page ranking
Academia.edu	Social networking site for academics/researchers	September 2008	211,000	Open	6,053 ^[5]
Blogster	<u>Blogging</u> community	November 24, 2005	85,579	Open	10,144 ^[27]
Classmates.com	School, college, work and the military	1995	50,000,000	Open to people 18 and older ^[46]	2,961 ^[47]
Facebook	General.	February 2004	800,000,000+	Open to people 13 and older	2 ^[87]
Flickr	Photo sharing, commenting, photography related networking, ...	February 2004	32,000,000	Open to people 13 and older (Yahoo! Login)	31

Rise of the Individual Developer

- **Conventional thinking** would indicate that to build an application of any great significance, you need a lot of people. **Web 2.0** thinking exposes this as incorrect.
- **Web 2.0** affirms that you can develop a better application, faster, with a **handful(minimum)** of developers **who know what they are doing**.
- Ex: In gaming industry some of the most sophisticated **3-D games** ever produced have been written soup-to-nuts by just a handful of developers.
- Most popular mashups & remixes follow a similar pattern.
- Ex: **Google Maps** (which kick-started the rich browser application movement) was developed by a very small company in approximately two weeks.
- Productivity is so high because developers have the tools they need on hand & because at the end of the day, the developers know what they're doing.

Amazon & Web 2.0:

- Amazon as a company has adopted the Web 2.0 line of thinking with open arms.
- It is making great strides toward defining the direction of its company &, to some degree, the internet itself.

Amazon & the Consumer:

- Amazon consumer Website offers a wide range of individual features to the customer that, when combined, provide a highly interactive experience.
- Amazon allows consumers to **review products, tag & categorize them, rate products, & even rate product reviews** by other customers.
- Overtime customer can build a reputation as a reviewer. This promotes a sense of ownership on the site.
- Customers can even publish photos they have taken of any products. This all serves the buyers by providing **additional data points that factor into their purchasing decisions.**

Amazon & the Developer:

- For developer , the Web 2.0 thinking is self-evident. Amazon has maintained a Web developers program for a no.of years.
- Amazon provides comprehensive access to its repository of functionality & data.
- This access is provided free of charge, so developers have a very low barrier of entry.

END OF CHAPTER 1