

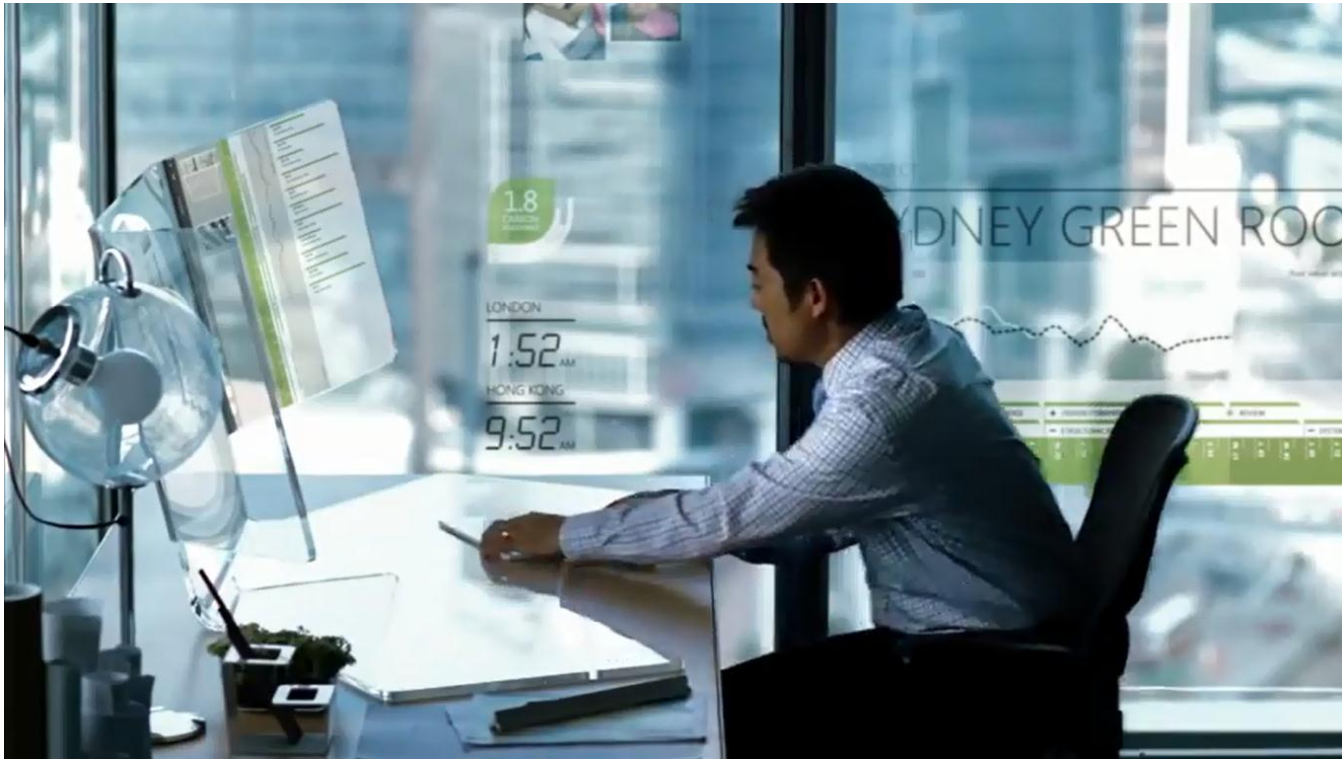
# **Personalized Search** **on the** **World Wide Web**



Presenter: Alexey Koshkidko  
Seminar: Personalizing the User Experience

Saarbrücken, 2012

# Personalized Environment



<http://www.youtube.com/watch?v=QL-zcUWwCZU>

**Microsoft's Future Concepts (HD)**

# **Personalized Search** **on the** **World Wide Web**



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Seminar: Personalizing the User Experience

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# Three search paradigms



Surfing



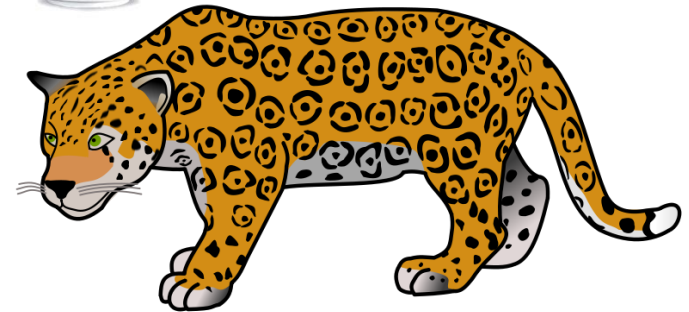
Recommendation



# Traditional search



rap



What kind of?

What actually?

# User profile

- Contains information of user preferences
- Used by search engines for personalizing
- May be filled using *explicit* and *implicit* approaches



# User profile - filling

## Two approaches

Explicit



Questionnaires

Feedback requests

Polls

Implicit



Privacy  
policy

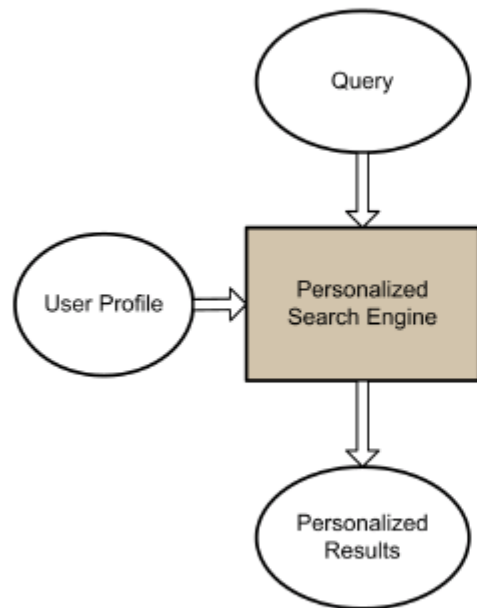
Using browser history

Mail and documents analysis

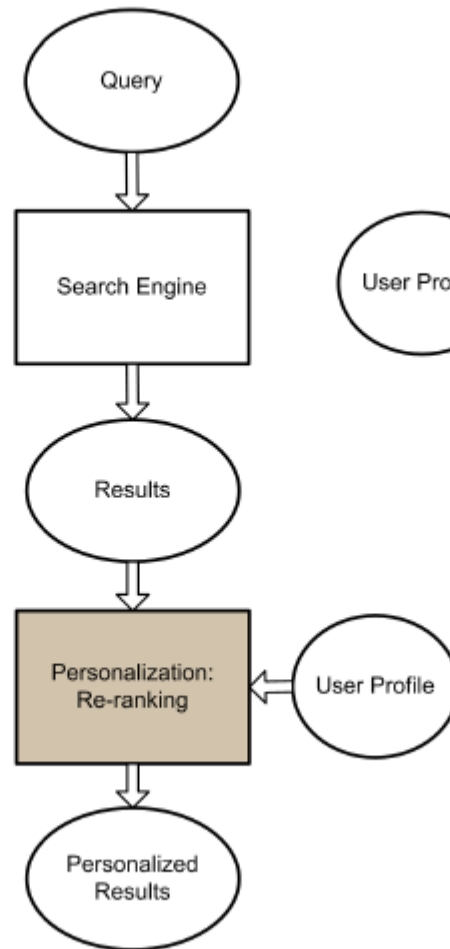
User behavior analysis

# User modeling component

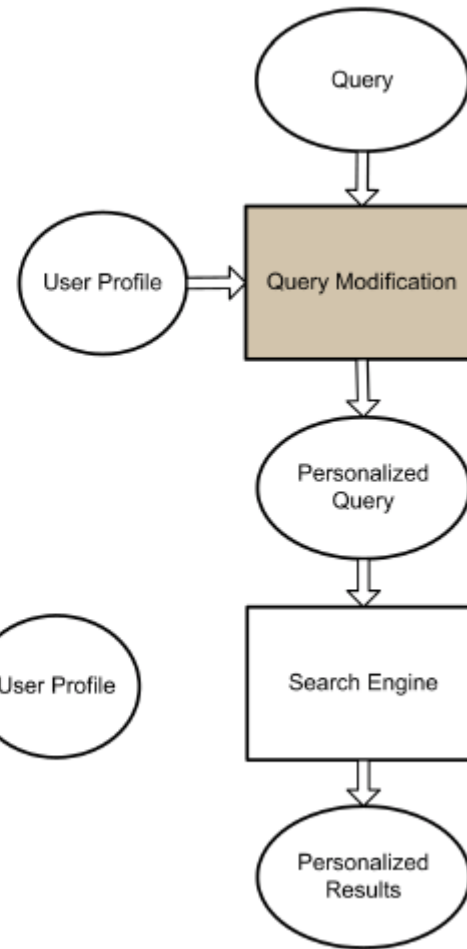
Part of retrieval process



Re-ranking

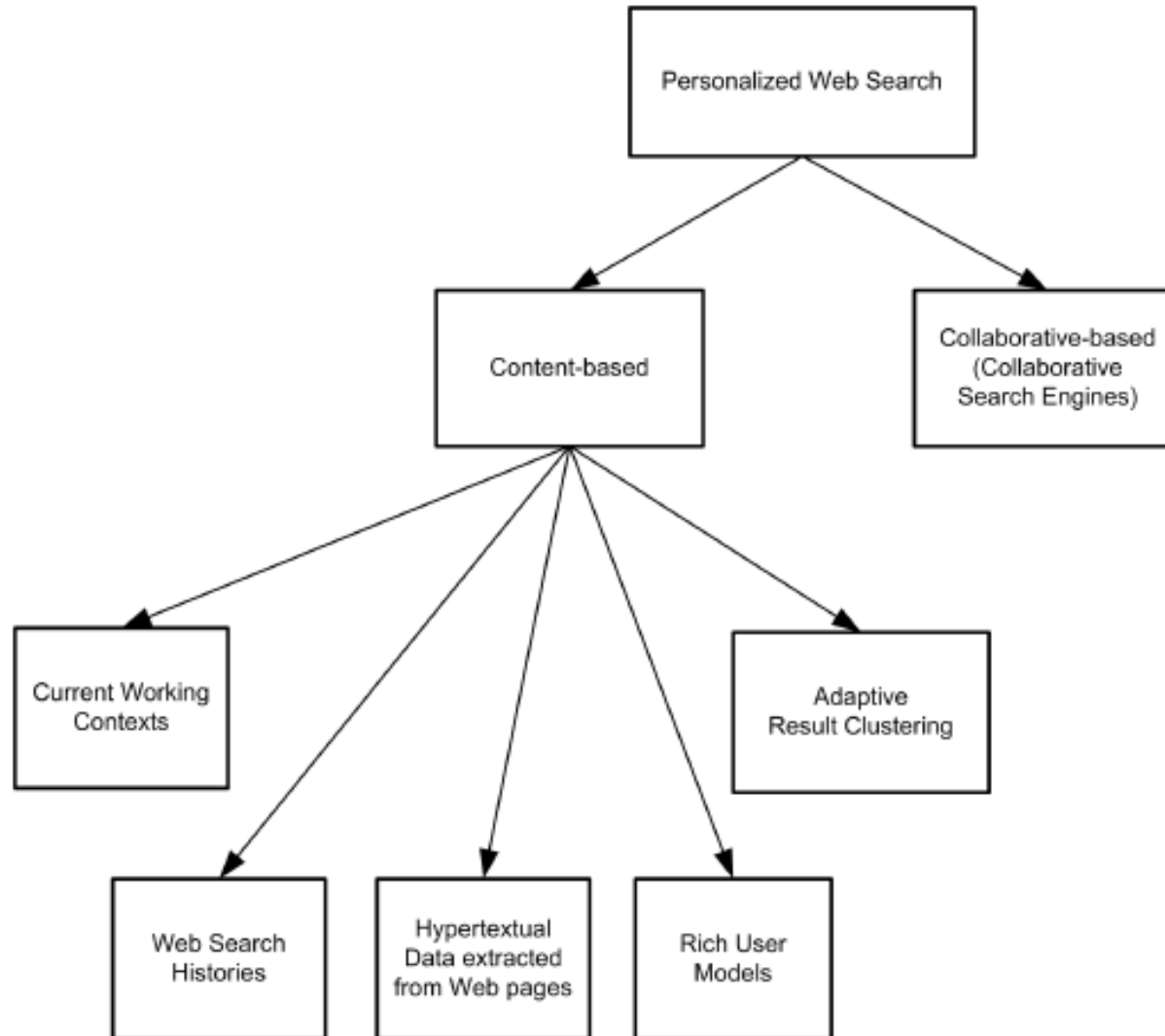


Query modification





# Types of personalized search



# Contextual search

- Just-in-Time, implicit approach
- Monitors interaction with software
- Alerting pushes information related to current activity
- Updating user profile dynamically

Remembrance agent

List of documents  
related to what the  
user typing or reading

Margin notes









Add hyperlinks to web-  
pages

Jimminy

Provides information  
about user's physical  
environment

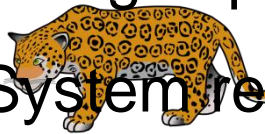
# Search histories



22:06	 Intelligente Lösungen für die Wissensgesellschaft — DFKI <a href="http://www.dfki.de">www.dfki.de</a> 
22:05	 <a href="http://www.jaguar.com">Jaguar Россия - Jaguar Cars www.jaguar.com</a> 
22:05	 Pendulum - Slam (HD) - YouTube <a href="http://www.youtube.com">www.youtube.com</a> 
22:05	 Contextual search - Поиск в Google <a href="http://www.google.ru">www.google.ru</a> 



- Using implicit feedback technique
- System records a trail of all queries and the Web sites the user has visited
- Assigning a higher score to the resources related to what the user has seen in the past



# Search histories

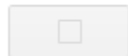
Q

Alexey Koshkidko0

Web History is on

Pause

[Learn more](#)



Remove

Remove all Web History

## Today

- ☐ Searched for [soad aerals](#)
- ☐ Searched for [google search history](#)
  - ☐ [Google Accounts](#) - [google.com](#) ★
- ☐ Searched for [центр инвест](#)
  - ☐ [Joint Stock Company Commercial Bank "Center...](#) - [centrinvest.ru](#) ★
- ☐ Searched for [live is the waterfal](#)

## Yesterday

- ☐ Searched for [Microreboot: A technique for cheap recovery](#)
  - ☐ [Microreboot – A Technique for Cheap Recovery](#) - [usenix.org](#) ★

## Web Activity

Jul 2012

< >

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31	1	2	3	4

9:14pm

6:16pm

6:16pm

1:24am

1:24am

12:27am

7:55pm

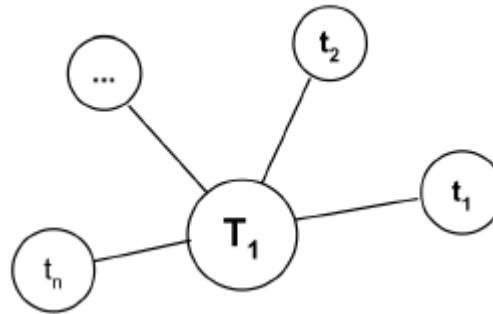
7:56pm

1 - 20 21 - 35 36 - 75 76+

Total Google searches: 9558

# Rich representation of User Needs

- Use on explicit feedback
- Based on frames of semantic networks



ifWeb

Wifs

InfoWeb

Web navigation

Filtering HTML or text

Content-based

Retrieval

documents

retrieval of Web

Filtering of documents

digital libraries

# Collaborative search engines

- Based on user behavior, not on content analysis
- Search referring to other users, communities of people

**eurekster**  
Audience Driven Search & Advertising

for **personalization of the internet**

Account: **Mario Rossi**  
Network: [G](#) | [Q](#) | [O](#) Contacts  
[SearchParties™](#) | [Invite Friends](#) | [Logout](#)

source: **web**

filter results by:

Did you mean: [group fire](#)?

top web results (1 - 10 of about 120)

**e** [Xerox spinoff touts service for better Web surfing](#)  
Corporate workgroups looking for a more productive way to search the Web can now access a free Internet service for sharing bookmarks that was developed at the Xerox Palo Alto Research Center, called **GroupFire**. ... Called **GroupFire**, the service lets users access, search and share their favorite Web resources from any computer over the Internet. **GroupFire** has a surf-along user interface that ...  
[http://www.networkworld.com/archive/2000/85952\\_01-31-2000.html](http://www.networkworld.com/archive/2000/85952_01-31-2000.html)

**e** [Service simplifies Web surfing](#)  
... The **GroupFire** service is free to end users and will be sold through OEM arrangements to search ... By combining bookmarks with searching, **GroupFire** hopes to improve the relevance of ...  
<http://www.itworldcanada.com/Pages/Docbase/ViewArticle.aspx?ID=idgm...>

What's Hot with...

Searches

DAWN.COM.PK	recent
future internet	
groupfire	
personalized search	
personalization	
future internet ...	
future internet ...	
msn newsbot dal...	
amazon recommend...	
DAWN.COM.PK	popular
future internet ...	
msn newsbot dal...	
amazon recommend...	
future internet ...	

# Collaborative search engines

## Query-page rules

Smartphone

Mobile computer

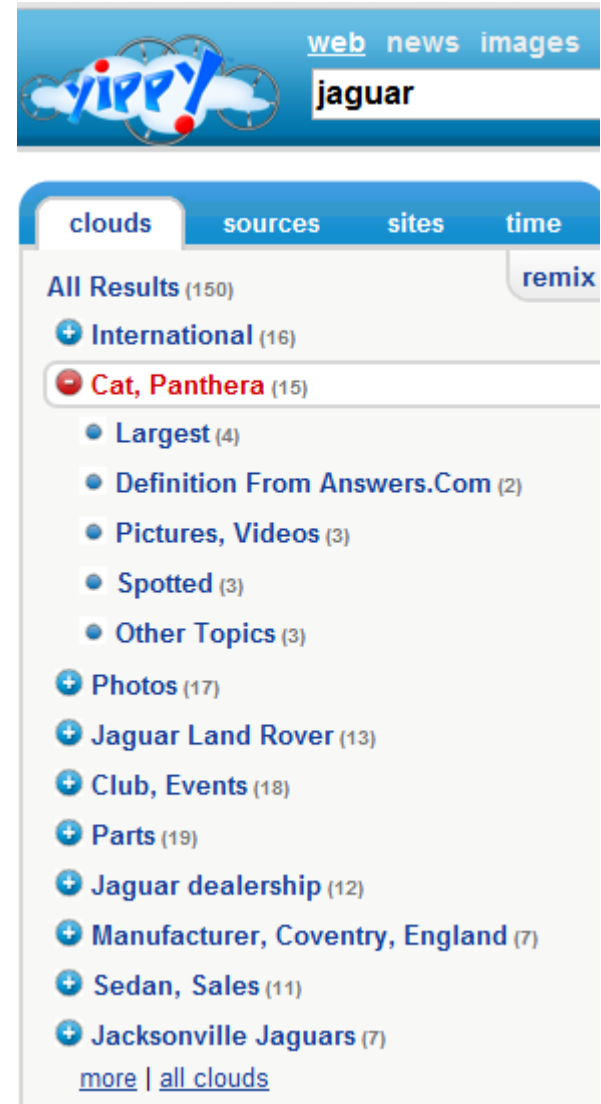


Mobile phone

Handheld device

# Adaptive result clustering

- Groups of items instead long lists
- Performed after information retrieval
- User need less time to find appropriate item





# Hyperlink-based Personalization

*PageRank (PR)* is a vote assigned to a page A collected from all the pages on the Web that point to it

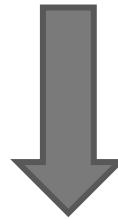
Personal ranking platform (PROS)

HubFinder

Collects hub pages related to the  
user profiles

HubRank

Combines the PR value with the  
hub value of HubFinder



Personalized version of PageRank

# Combined approaches




Clustering


Shop by Department ▾ Search All ▾ kindle Go Hello, v1sible Your Account ▾ 0 Cart ▾ Wish List ▾


[Back to School](#) **Back to School Deals in Computers, Office, and Software**  
Shop our selection of back-to-school essentials in [computers](#), [office products](#), [software](#), and more.

**Department**  
[Kindle Store](#)  
Kindles  
Kindle Covers  
Kindle Touch Covers  
Kindle Power Adapters  
Kindle Extended Warranties  
**Electronics**  
eBook Readers  
eBook Reader Covers  
eBook Reader Sleeves  
**Books**  
Literature & Fiction  
Contemporary Literature & Fiction  
Contemporary Romance  
British Detectives  
Epic Fantasy  
**Gift Cards Store**  
Gift Cards  
**Apps for Android**  
Book & Book Reader Apps  
**Computers & Accessories**  
Touch Screen Tablet Cases & Sleeves

**"kindle"**  
Related Searches: [kindle books](#), [kindle fire](#), [nook](#)  
Showing 1 - 16 of 3,071,492 Results Choose a Department ▾ to enable sorting

**Get Over 15% Off Kindle Covers and Cases**  
Kindle Sleeves  
Kindle Touch Covers & Cases  
Kindle Covers & Cases  
Kindle Fire Covers & Cases  
Kindle Touch Lighted Covers  
Kindle Lighted Covers  
Kindle Fire Screen Protector  
Want something else? Visit the [Kindle Accessories Store](#).

 **Kindle, Wi-Fi, 6" E Ink Display - includes Special Offers & Sponsored Screensavers** by Amazon  
**\$79.00**  
Order in the next **3 hours** and get it by Wednesday, Jul 18.  
★★★★★ (5,288)  
Eligible for **FREE** Super Saver Shipping.  
[Electronics: See all 73,266 items](#)

**Kindle Store**  


Kindle \$79	Kindle DX \$379
Kindle Touch \$99	Kindle Accessories
Kindle Touch 3G \$149	Free Kindle Apps
Kindle Fire \$199	Kindle Books
Kindle Keyboard 3G \$139	

# Combined approaches



Search history

These recommendations are based on [items you own](#) and more.

view: [All](#) | [New Releases](#) | [Coming Soon](#)

[More results](#)

1.



## [Incipio Inscribe Capacitive Tip Stylus for Kindle Fire, Black](#)

by Incipio (October 14, 2011)

Average Customer Review: [★★★★☆](#) (74)

In Stock

**Price:** \$14.99

[7 used & new](#) from \$13.73

[Add to Cart](#)

[Add to Wish List](#)

☐ I own it ☐ Not interested ☒ [★★★★☆](#) Rate this item

Recommended because you purchased **Kindle Fire, Full Color 7" Multi-touch Display, Wi-Fi** ([Fix this](#))

2.



## [Amazon Kindle Lighted Leather Cover, Wine Purple \(does not fit Kindle Touch or Kindle Keyboard\)](#)

by Amazon (October 1, 2011)

Average Customer Review: [★★★★☆](#) (659)

In Stock

**List Price:** \$59.99

**Price:** \$59.99

[12 used & new](#) from \$25.99

[Add to Cart](#)

[Add to Wish List](#)

☐ I own it ☐ Not interested ☒ [★★★★☆](#) Rate this item

Recommended because you purchased **Kindle, Wi-Fi, 6" E Ink Display - includes Special Offers...** and more ([Fix this](#))

3.



## [Amazon Kindle Leather Cover, Wine Purple \(does not fit Kindle Touch or Kindle Keyboard\)](#)

by Amazon (October 1, 2011)

Average Customer Review: [★★★★☆](#) (364)

In Stock

**List Price:** \$39.99

**Price:** \$39.99

[6 used & new](#) from \$6.92

[Add to Cart](#)

[Add to Wish List](#)

☐ I own it ☐ Not interested ☒ [★★★★☆](#) Rate this item

Recommended because you purchased **Kindle, Wi-Fi, 6" E Ink Display - includes Special Offers...** and more ([Fix this](#))

# Combined approaches



Collaborative approach

## Best-Selling Android and Kindle Fire Apps



Entertainment



Games



Music



Productivity



Social Networking

> [Shop Amazon Apps](#)

## The Most Laptops, the Best Prices



[HP](#)



[Apple](#)



[Toshiba](#)

> [See all laptops](#)

# Summary



What actually?

What kind of?

Content based

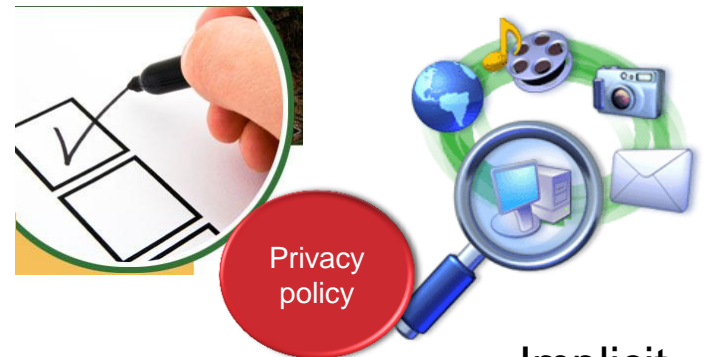
Behavior based

Combined approaches

User profile



Explicit



Implicit

**THANK YOU**

