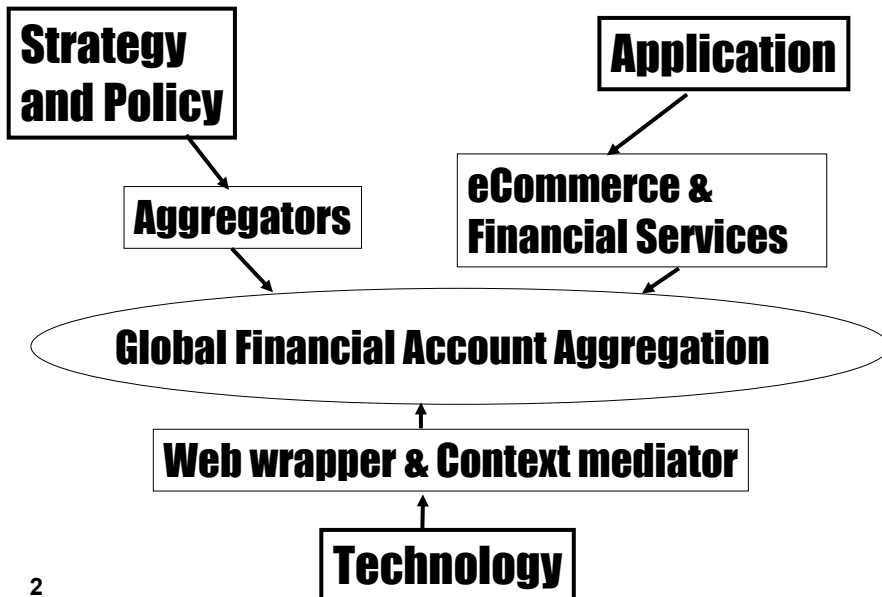


SMA 5506
Database Technology
Summer 2005
Session L18

**Web Aggregators and
Aggregation Research:**
Prof. Stuart Madnick
(smadnick@mit.edu)

© S. Madnick & M. Siegel, 2005

Multiple Perspectives



Overview: Aggregation – Focus on Information Re-use and Re-purposing

- **Aggregator definition, types & examples**
- **Emerging Global Aggregation**
- **Enabling Technologies**
- **New Emerging Aggregators**
- **Strategy, Legal, Cultural, and Policy Issues**
- 3 • **Summary**

Aggregator Definition

- **Transparently collects information**
 - **with or without prior source arrangement**
 - **resolves contextual differences**
- **Performs analysis**
 - **not merely gather**
- **Represents user**
 - **acts as agent for user**

Aggregator Types & Examples

Sources

Types	Internal	External
Comparison	Benchmarking divisions	Shop for best prices (e.g., books)
Relationship	Customer Relationship Management (CRM)	Financial account aggregation
Complementary	Department calendars	Investment analysis, policy analysis

5

www.amazon.com

The screenshot shows the Amazon.com interface for a book. At the top, there's a navigation bar with 'amazon.com', 'YOUR ACCOUNT', and 'HELP'. Below that are category tabs: WELCOME, BOOKS, MUSIC, VIDEO, TOYS & GAMES, ELECTRONICS, e-CARDS, AUCTIONS. The main content area features a sidebar with 'Book Information' and 'at a glance' links. The main product listing includes the title 'Microsoft Secrets: How the World's Most Powerful Software Company Creates Technology, Shapes Markets, and Manages People' by Michael A. Cusumano and Richard W. Selby. It shows a list price of \$30.00, a current price of \$21.00, and a 30% discount. A 'Hardcover (October 1995)' edition is highlighted. The Amazon.com Sales Rank is 32,674. A 'Write an online review' section is also visible.

6

www.books.com *

Books.com SEARCH CONTENTS CAFE ACCOUNT ORDER HELP
 Go To MUSICSPOT.COM Go To GOODMOVIES.COM

ADDITIONAL INFORMATION

Microsoft Secrets; How The World's Most Powerful Software Company Creates Technology, Shapes Markets, And Manages People
 by Cusumano, Michael A. (With Selby, Richard W.)

Retail Price	Our Price	Amazon	B&N	Borders
US\$30.00	\$20.95 (Save 30%)	\$21.00	\$21.00	\$21.00

Binding	Pub Date	Category	Publisher	ISBN
Hardcover	10/1995	Computer Books: General	Free Press	0026740483

Availability: Usually ships out in 2-3 business days.

More titles by: Cusumano, Michael A. (With Selby, Richard W.)

Today, Microsoft commands the high ground of the information superhighway by owning the operating systems and basic applications programs that run on the world's 170 million computers. Beyond the unquestioned genius and vision of Bill Gates, what accounts for Microsoft's astounding success?

For the first time, drawing on almost two years of on-site observation at Microsoft

7 * Acquired by Barnes & Nobles

www.mysimon.com

mySimon Books Search Results

home > books, music & movies > books > search results

Departments

Total results: 10
 30 merchants today in books
 Give us your Feedback!

Shipping Location: Cont. US - Street
 Shipping Method: Standard

Microsoft SECRETS
 Microsoft Secrets: How the World's Most Powerful Software Company Creates Technology, Shapes Markets, & Manages People
 Author: Michael A. Cusumano

Format: Hardcover
 Publishers: Free Press, The
 Date Published: 00:00:00.0
 Number of Pages: 416
 ISBN: 0026740483
 List Price: \$30.00

Tip: Did you know that results can be SORTED alphabetically or numerically? Click on the column names to sort!

Merchant	Price	Shipping Method	Shipping Time	Shipping Cost	Total Price
AllDirect.com	\$18.00	USPS Ground	7-21 days	\$3.45	\$ 21.45 BUY!
Amazon.com	\$21.00	Standard Shipping	3-7 days	\$3.95	\$ 24.95 BUY!
Borders.com	\$21.00	Standard	3-7 days	\$3.95	\$ 24.95 BUY!
Fatbrain.com	\$21.00	Standard	3-7 days	\$3.95	\$ 24.95 BUY!
Books Now	\$27.00	USPS Priority Mail	10-12 days	\$4.95	\$ 31.95 BUY!
Big Words	\$18.51	USPS Fast (Less than \$35)	3-5 business	\$4.90	\$ 23.41 BUY!

8

www.evenbetter.com *

Netscape - [DealPilot.com, the Ultimate Comparison Shopping Engine: Price Comparison Results]

Click on one offer (1st column) to proceed to the respective shop!

Displaying Top Ten offers:

Total Price	Shop	Item Price	Discount	US Sales Tax	Shipping Costs	Shipping Time	Shipping Service	Delivery Time
US\$ 19.55	barnesandnoble.com, USA, NJ/NY/VA	US\$ 15.60	40%	US\$ 0.00	US\$ 3.95	3-6 days	U.S. Postal Service	4-7 days
US\$ 20.95	A1 Books, USA, NJ	US\$ 17.00	35%	US\$ 0.00	US\$ 3.95	4-6 days	UPS Ground	9-11 days
US\$ 21.37	AlphaCraze.com, USA, NY/CA	US\$ 17.42	33%	US\$ 0.00	US\$ 3.95	3-7 days	UPS Regular Mail	n/a
US\$ 21.54	BCY Book Loft, USA, OH	US\$ 17.54	33%	US\$ 0.00	US\$ 4.00	14 days	USPS 4th Class	n/a
US\$ 21.58	Shopping.com, USA, CA	US\$ 17.68	32%	US\$ 0.00	US\$ 3.90	3-5 days	Economy	6-10 days
US\$ 21.68	Kingbooks.com, USA, WA	US\$ 19.24	26%	US\$ 0.00	US\$ 2.44	14 days	USPS Book Rate	16 days
US\$ 22.00	Books.com, USA, OH	US\$ 18.15	30%	US\$ 0.00	US\$ 3.85	14-42 days	USPS Book Rate	16-45 days
US\$ 22.10	Borders.com, USA, MI/TN	US\$ 18.20	30%	US\$ 0.00	US\$ 3.90	3-7 days	Standard	4-8 days
US\$ 22.10	Books.com, USA, OH	US\$ 18.15	30%	US\$ 0.00	US\$ 3.95	2-10 days	UPS	4-13 days
US\$ 22.15	Amazon.com, USA, WA/NV	US\$ 18.20	30%	US\$ 0.00	US\$ 3.95	3-7 days	USPS Priority Mail	4-8 days

9

* Now called DealTime.com **Comment: Need for Mega-Aggregators**

Mega - Aggregators

- ☉ **Note: multiple book price aggregators**
 - using differing sources
 - giving differing results !
- ☉ **What about an aggregator of aggregators**
 - **A Mega-Aggregator ... more later ...**
- ☉ **Aggregators not just about prices ...**

www.usair.com

[US AIRWAYS HOME](#)
[DIVIDEND MILES](#)

Current Dividend Miles Account Statement

Member Name: DR. STUART E MADNICK
Dividend Miles Account Number: 561N1E6
Membership Level: Dividend Miles Member

Miles Posted as of: July 22, 1999

Account Statement

Current Balance:	36,216
Year-To-Date Preferred Miles :	2,000
Year-To-Date Preferred Segments :	4

Account Activity Since Your Last Statement

Date	Transaction Description	Actual Miles	Bonus Miles	Total Miles
07/22/99	TRAVEL MILES	2000	1000	3000

Document: Done

[Start](#)
[Nor...](#)
[Eu...](#)
[Ex...](#)
[Mic...](#)
[Mic...](#)
[Pal...](#)
[Mic...](#)
[Add...](#)
[Ne...](#)
10:55 PM

11

www.maxmiles.com

MileageMiner Sample Report - Microsoft Internet Explorer provided by America Online

[Messages](#) | [Account Summary](#) | [Expiration Summary](#) | [Activity Summary](#) | [Missing Flight Info](#) | [Offers](#)

Account Summary

Program	Account Balance	Program Status	Account Last 4 Digits
American	16,890	Member	3694
Continental	N/A	N/A	8788
Delta	7,734	SkyMiles Member	8793
Hilton	3,875	Member	3909
Hyatt	34,373	Platinum	7746
Marriott	5,550	Red	5573
Northwest	4,528	Gold	9851
United	71,854	Premier Executive	9578
Midwest Express	500	Member	4355

[Messages](#) | [Account Summary](#) | [Expiration Summary](#) | [Activity Summary](#) | [Missing Flight Info](#) | [Offers](#)

Expiration Summary

Program	No Expiration	Expires 1998	Expires 1999	Expires 2000	Expires 2001 +
American	0	7,168	3,302	5,703	717
Continental	N/A	N/A	N/A	N/A	N/A
Delta	7,734	0	0	0	0
Hilton	3,875	0	0	0	0
Hyatt	34,373	0	0	0	0
Marriott	5,550	0	0	0	0
Northwest	0	0	0	0	4,528

[Start](#)
[Nor...](#)
[Eu...](#)
[Ex...](#)
[Mic...](#)
[Mic...](#)
[Pal...](#)
[Mic...](#)
[Mi...](#)
[Net...](#)
10:45 PM

12

What is MaxMiles

You give it all your frequent flyer info, it ...

- **Does mileage management for you ...**
- **Gathers all your frequent flyer info**
- **Sends a personalized report via email**
- **Updates reports on web site daily**
- **Searches for missing mileage credits**
- **Analyzes most current milage offers**

13

From US Airways site

"Access to this information is subject to the rules in the Dividend Miles Membership Guide. In addition, by using this site to access your Dividend Miles account, you agree that you will use this site in a manner consistent with the Dividend Miles Membership Guide and you further agree not to allow access to this site to any third party by revealing your access code to any third party for any reason. Failure to comply with the foregoing restrictions on the use of this site shall be grounds for the termination of your access to this site and/or your membership in the Dividend Miles program."

14

“Power of Attorney” on MaxMiles Site

Enroll in MaxMiles - Microsoft Internet Explorer provided by America Online

File Edit View Favorites Tools Help

Frequency of email statements: Monthly

Limited Power of Attorney

By clicking in this checkbox, I am indicating that I have read and that I accept the following terms and grant MaxMiles, Inc. (MaxMiles) the rights described below.

I authorize MaxMiles to access and obtain my frequent flyer account information from the frequency programs described on this registration form, as the same may be amended from time to time. For all purposes hereof, MaxMiles is granted a limited power of attorney, and I hereby appoint MaxMiles as my true and lawful attorney-in-fact and agent, with full power of substitution and resubstitution, for me and in my name, place and stead, in any and all capacities, to access such data from the frequency programs at all times as MaxMiles may determine in its sole discretion, with the full power and authority to do and perform each and every act and things requisite and necessary to be done in connection with such access, as fully to all intents and purposes as I might or could do in person. MaxMiles is further authorized to utilize such information in preparing reports regarding my accounts and can consolidate this information for MaxMiles' use as it determines in its sole discretion. I understand that MaxMiles acts solely as an intermediary, that my benefits are subject to the program sponsors' individual terms and restrictions, and that MaxMiles has no authority to access, direct or divert any program awards or other benefits. I further understand that MaxMiles has no relationship to or connection with any airline, hotel or other frequent traveler program sponsor, and agree that MaxMiles has no responsibility and shall incur no liability with respect to the acts, omissions or determinations of any program sponsor.

Join MaxMiles

Cancel

15 Start Not... Eud... Expl... Micr... Micr... Palm... Micr... Ent... Free... 10:33 PM

Complementary Aggregator Integrated Spreadsheet

Microsoft Excel - demo, rev. 4.0

File Edit View Format Tools Data Window Help

Stock Portfolio

Available Portfolio: Atributes from Research Report Atributes from Edgar SEC Filings

Market Value

Stock	Ticker Symbol	Shares held	Purchase Price	Current Price	Market Value	Gain / Loss	Investment Opinion	Net Income
Intel Corp	INTC	15000	50	1484375	664375	8.117	18X	
Int'l Bus Machine	IBM	24000	66	102	240000	90000	1.796	
General Motors	GM	36000	50	64	2240000	40000		
					Total Value	6164375		

Latest News: **YAHOO! FINANCE** CESS DROPS

Real time Tibco

Sources

External

Internal

Marvill Lynch Research Report: General Motors

Long Term Recommendation: ACCUMULATE

Price:	587
12 Month Price Objective:	600
Enterprise (Dec)	0.66
EPS:	27.66
P/E:	2.13
Opinion & Financial Data	
Investment Opinion:	ACCUMULATE
Mkt. Value / Shares Outstanding (mil):	209,011

Everyone is impacted: If you are not an Aggregator, you are an Aggregatee

- **Books.com, MySimon.com, EvenBetter.com**
 - **Barnes and Noble, Borders, Amazon, ...**
- **MaxMiles**
 - **United, American, TWA, US Air, ...**
- **Universal Financial Aggregator (UFA)**
 - **your banks, your brokers, your billers, ...**
- **NOTE: Aggregatees -> Aggregators**

17

Overview

- **Aggregator definition, types & examples**
- **Emerging Global Aggregation**
- **Enabling Technologies**
- **New Emerging Aggregators**
- **Strategy, Legal, Cultural, and Policy Issues**
- **Summary**

18

Global Comparison Aggregator

Want to find the best online price?

Motivation

[Regional Aggregators](#)
[Price Dispersion](#)
[Price? What is it, really?](#)

Design

[COIN Approach](#)
[Context Examples](#)
[Domain Ontology](#)
[Conversion Functions](#)

Live Demo

Are you interested in shopping for a [SONY DCR-JP5](#), a pocket-sized digital camcorder that weighs only 12 oz (367g), records in MPEG format, and looks like the one shown here?



Yes!

OK, we will help you find the best prices online!
Which country are you from or would you like to do your shopping?

Germany	Submit
France	
Germany	
Italy	
Japan	
Mexico	
The Netherlands	
Norway	
Spain	
Sweden	
UK	
USA	

19

<http://soursop.mit.edu/global>

Best global online price

Best Prices Found ...

Motivation

[Regional Aggregators](#)
[Price Dispersion](#)
[Price? What is it, really?](#)

Design

[COIN Approach](#)
[Context Examples](#)
[Domain Ontology](#)
[Conversion Functions](#)

Live Demo

We searched **16** online stores in Sweden and the lowest price was **\$1750**.

Even better:



We also searched stores outside Sweden. We searched a total of **172** stores worldwide and the lowest price was **\$783** from a store in The Netherlands.

In case you are interested, the highest price was **\$2237** from a store in Sweden.

Is that cool to find out the world best prices when you shop online? Out of curiosity, you may have a few questions, such as:

How prices of the camcorder differ in various parts of the world?
- Take a guess. Then go to [Price Dispersion](#) for some hint.

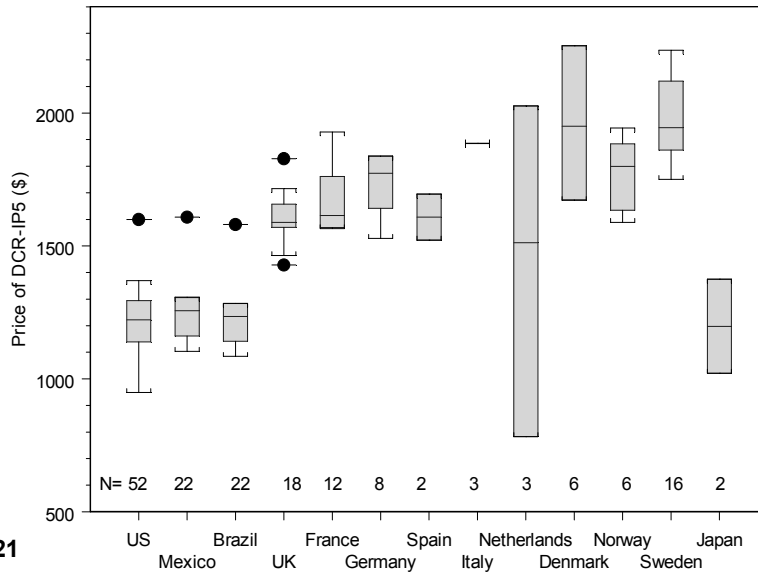
Is there a global bargain finder like this for me to use?
- Not really. Although there are [tools that search prices regionally](#).

Does the lowest price from the Netherlands include shipping?
- Great question! See "[Price - What is it, really?](#)" for explanations.

What are the challenges for building a global bargain finder?
- See the [Design](#) section for our approach and a [live demonstration](#).

20

Global Price Comparison



21

Mega-Aggregator: Using Regional Aggregators

Price	State	Phone	Shipping	In Stock	Prix	Prix total	Sort by: Price	Sort by: Price with shipping	Sort by: Online
\$999.00									
\$1195.00					1 789,00 € Port gratuit Livraison : 15 à 21 jours Disponibilité : Voir site	1 789,00 € (11 735 FF)	£361.98	Check with retailer	
\$1199.99		0 kr - 180 kr		16400 kr 16500 k	1 798,00 € Port gratuit Livraison : 15 à 21 jours Disponibilité : Voir site	1 798,00 € (11 794 FF)	£369.89	Check with retailer	
\$1299.99					1 999,00 € Port gratuit Livraison : 2 à 3 jours Disponibilité : En stock Garantie : 2 ans	1 999,00 € (13 113 FF)	£399.95	Check with retailer	
\$1199.94		0 kr - 140 kr		16990 kr 17130 k	1 795,00 € + Port : 7,00 € Livraison : 2 à 3 jours Disponibilité : Voir site Garantie : 2 ans	1 802,00 € (11 820 FF)	£326.16		Direct link
\$1199.95		108 kr - 112 kr		17098 kr 17102 k	1 530,00 € + Port : 7,00 € Livraison : 2 à 3 jours Disponibilité : Voir site Garantie : 2 ans	1 537,00 € (10 082 FF)	£389	£936.16	Direct link
\$866.00					1 399,00 € + Port : 9,00 € Livraison : 2 à 10 jours Disponibilité : Voir site Garantie : 2 ans	1 408,00 € (9 236 FF)	£389	£1001	Direct link
\$1199.99 <small>Call for Best Price!</small>									
\$867.00									
\$893.99									

22

US

Sweden

France

UK

Global Complementary Aggregation

❁ **Q: How did CO2 emissions (total, per GDP, per capita) change over time (between 1990 and 2000) in Yugoslavia?**

- **User 1: YUG as a geographic region bounded before the breakup**
- **User 2: YUG as a legal autonomous state**



Related effort:

- **Laboratory for Information Globalization and Harmonization Technologies (LIGHT)**

23

World Bank's World Dev. Indicator DB; UN Statistic Division; Statistics Bureaus

Country	1990		2000	
	GDP	Pop	GDP	Pop
YUG	698.3	23.7	1627.8	10.6
BIH			13.6	3.9
HRV			266.9	4.5
MKD			608.7	2.0
SVN			7162	2.0

GDP in billions local currency;
Population in millions

Country	Code	Currency	CurCode
Yugoslavia	YUG	New Yug. Dinar	YUN
Bosnia and Herzegovia	BIH	Marka	BAM
Croatia	HRV	Kuna	HRK
Macedonia	MKD	Denar	MKD
Slovenia	SVN	Tolar	SIT

OAK Ridge's CDIAC DB; WRI; GSSD; EPAs

Country	CO2 Emission	
	1990	2000
YUG	35604	15480
BIH		1279
HRV		5405
MKD		3378
SVN		3981

In 1000 tons per year

Olsen (Web)

From	To	1990	2000
USD	YUG	10.5	67.267
USD	BIH		2.086
USD	HRV		8.089
USD	MKD		64.757
USD	SVN		225.93

Country	User 1		User 2	
	1990	2000	1990	2000
CO2	35604	29523	35604	15480
GDP	66.5	104.8	66.5	24.2
CO2/capita	1.5	1.28	1.5	1.46
CO2/GDP	535	282	535	640
GDP/Capita	2800	4560	2800	1100

Total CO2 in 1000 tons per year; GDP in billions USD;
CO2/Capita in tons per person; CO2/GDP in tons per million USD; GDP/Capita in USD per person

24 **Many sources needed:
Meanings in sources & users might differ**

Overview

- **Aggregator definition, types & examples**
- **Emerging Global Aggregation**
- **Enabling Technologies**
- **New Emerging Aggregators**
- **Strategy, Legal, Cultural, and Policy Issues**
- **Summary**

25

Emerging Technologies

- **Web wrappers**
 - **Extract selected information from web**
 - **Allows web to be treated as large database**
 - **Context mediators**
 - **Resolve semantic (meaning) differences**
 - **Enable meaningful aggregation**
- & comparison**

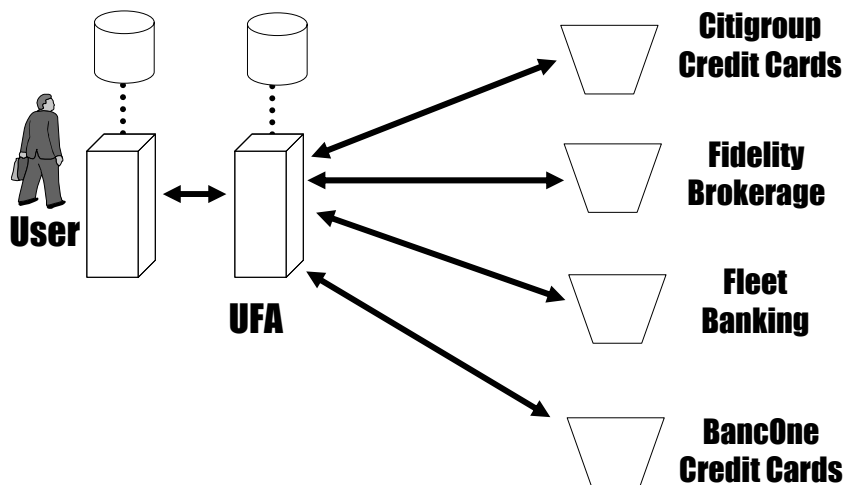
26

Overview

- **Aggregator definition, types & examples**
- **Emerging Global Aggregation**
- **Enabling Technologies**
- **New Emerging Aggregators**
- **Strategy, Legal, Cultural, and Policy Issues**
- **Summary**

27

Concept of a Universal Financial Aggregator (UFA)



28

COntext INterchange Project (context2.mit.edu/coin)

29

Netscape - [COntext INterchange: Main Page]

File Edit View Go Bookmarks Options Directory Window Help

What we do
[Agregator Home](#)
[Demos](#)
[Publications](#)
[News](#)
[Current Team](#)
[Alums](#)
[Acknowledgments](#)
[Related Efforts](#)

COntext INterchange
Project

Home of Aggregator Research

Document Done

Start Norton Eudor Explor Micro Palm COnte Nets Micro

11:59 AM

Universal Financial Aggregator (UFA) Demonstration

30

Universal Banking Application - Microsoft Internet Explorer provided by America Online

File Edit View Favorites Tools Help

Universal Financial Application

Username:

Password:

About The Universal Financial Application

Ever since the deregulation of the financial industry in the 80s, individuals have been expanding the number of financial institutions that serve them. It is not uncommon to find a person with a credit card that comes from a different bank than the issuer of his/her checking account.

The Universal Financial Application (UFA) is a demonstration that provides integrated access to all of the user's financial accounts that are accessible online. Instead of only seeing individual accounts, the user can instantaneously view his/her financial status through a personalized balance sheet. In addition, the UFA also helps the user manage the plethora of logins and passwords. Moreover, given the user's financial information as well as knowledge of other available financial products, the UFA is capable

Start Norton Explor Eudor Mic Mic Pal Mic http Mic U...

10:11 PM

Aggregated Report produced (top part)

UBA - Microsoft Internet Explorer provided by America Online

File Edit View Favorites Tools Help

Universal Financial Application

Advisors Wizards Agents

Edit Account Log Out

Deposit Accounts

Bank Name	Account Number	Nickname	Account Type	Available Balance
BankOne	426842545	234234	Checking	2200.00
Security First Network Bank	1298145662	My general account	MMA	2000.00
Citibank	785149478	school 1	Checking	957.00
Total:				5157.00

Credit Cards Accounts

Issuer	Account Number	Nickname	Available Credit	Balance
FirstUSA	413741589	Misc. Card	788.00	1212.00
FirstUSA	312454584	Emergency Card	900.00	100.00
Total:				1688.00

31

Start Nor... Exp... Eud... Mic... Pal... Mic... http... Mic... U... 10:14 PM

31

Aggregated Report produced (bottom part)

UBA - Microsoft Internet Explorer provided by America Online

File Edit View Favorites Tools Help

Universal Financial Application

Advisors Wizards Agents

Edit Account Log Out

FirstUSA	312454584	Emergency Card	900.00	100.00
Total:				1688.00

Brokerage Accounts - click here to aggregate all your brokerage accounts

Broker	Account Number	Account Name	Nick Name	Total Value
E*TRADE	943856	SASHAM	Daydream Account	94168.75
E*TRADE	742841	Steven	Trading Account	61612.75
E*TRADE	545631	test1	test1	0.00
Total:				155781.50

Net Worth

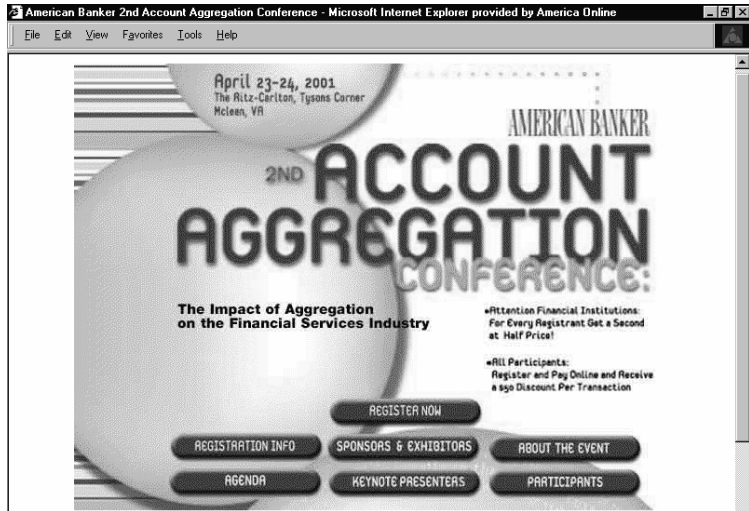
Assets	Savings	5157.00
	Brokerage	155781.50
Liabilities	Credit Card Accounts	1312.00
Total:		159626.50

32

Start Nor... Exp... Eud... Mic... Pal... Mic... http... Mic... U... 10:14 PM

32

“Aggregation ... The ‘killer app’ in the e-finance revolution”



33

<http://www.tfconferences.com/conferences/AAG01/index.html>

Current UFA Offerings (examples)

Account Aggregation Technology Suppliers

- **Yodlee**
- **VerticalOne**
- **eBalance**

Account Aggregation Offerings

- **Chase, Fleet, Citibank (myCiti.com), ...**
- **Merrill-Lynch, Fidelity Investments, ...**
- **Yahoo, AOL, ...**

34

Commercial Financial Account Aggregators

Aggregatee

Aggregator

Aggregatee

Aggregatee

Aggregator

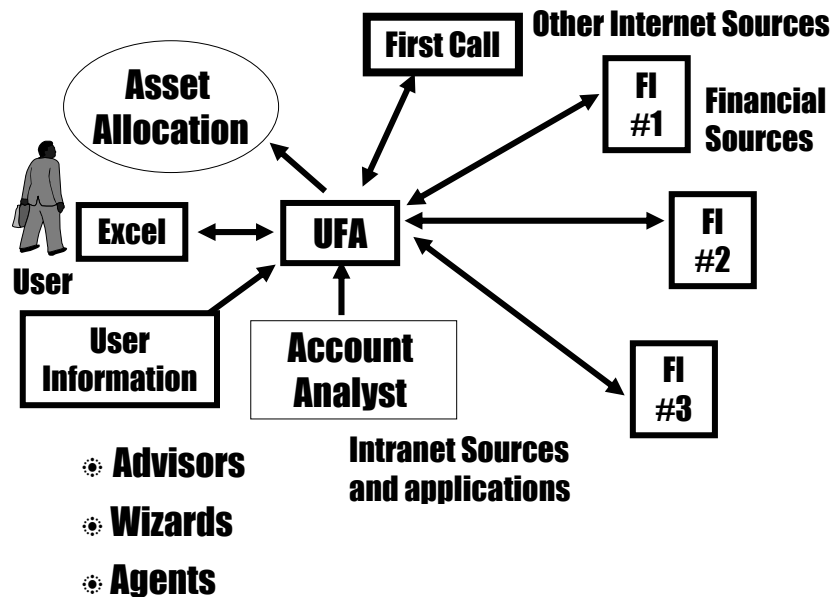
Access both Citi and non-Citi accounts in one secure place.

Link directly to your accounts without separate log in.

Get account details, including transactions and payment due dates.

Consolidate all your investment information.

Real Value: "After Aggregation" Services



Advisors: Stock holdings re-aggregate

Portfolio View - Microsoft Internet Explorer provided by America Online

File Edit View Favorites Tools Help

Account Summary

Brokerage	Account Number	Total Value
E*Trade	943856	37695.00
E*Trade	742841	23449.16
E*Trade	545631	0.00

Money Market Balance

0.00

Stocks

Symbol	Quantity	Price	Value
AXP	100.00	41.33	4133.00
C	256.00	49.87	12766.72
CNET	100.00	10.55	1055.00
COF	300.00	64.16	19248.00
FBF	100.00	39.13	3913.00
LU	300.00	7.74	2322.00
MSFT	200.00	71.56	14312.00
RHAT	0.00	5.21	0.00
SUNW	200.00	17.08	3416.00

Total: 61165.72

37

Start Nort... Exp... Micr... Eud... Palm... Micr... Stev... UBA... Por... 2:42 PM

Wizards: Money Market (MMA) example

UBA - Microsoft Internet Explorer provided by America Online

File Edit View Favorites Tools Help

Universal Financial Application

Advisors Wizards Agents Edit Account Log Out

My Account Summary
as of Thu, 10 Feb 2000 22:11:08 -0500

Deposit Accounts

Bank Name	Account Number	Nickname	Account Type	Available Balance
BankOne	426842545	234234	Checking	2200.00
Security First Network Bank	1298145662	My general account	MMA	2000.00
Citibank	785149478	school 1	Checking	957.00

Total: 5157.00

Credit Cards Accounts

Issuer	Account Number	Nickname	Available Credit	Balance
--------	----------------	----------	------------------	---------

38

Start Nort... Exp... Eud... Micr... Micr... Pal... Micr... htp... U... 10:15 PM

MMA is also an aggregator, of MM rate sources

UBA - Microsoft Internet Explorer provided by America Online

Maintain your accounts with the help of electronic wizards

Wizards

Advisors | Wizards | Agents

Please select a wizard: Money Market Wizard Go!

The MMA Wizard has examined your account. If you put your money in:

Republic Bank and Trust for 12 months you can make an extra: \$173.38*
*at the current rates

Here's what you *would* have saved using the Money Market Aggregator!

The following are the Top 3 options available to you:

Bank Name	APY	Minimum Deposit	Possible Earnings	
Republic Bank and Trust	5.36	5000	\$173.38	Do IT
Domestic Bank	5.30	5000	\$163.04	Do IT

39

Start No. Ex. Eu. Mi. Mi. Pa. Mi. ht. Mi. U... U... 10:22 PM

Better rates

Multi- Mega- Aggregators !

- **The Universal Financial Aggregator (UFA) :**
- **Aggregates your financial information**
 - **several ways: totals and stock holdings**
- **Also uses the Money Market Aggregator**
 - **which draws on multiple MM sources**
 - **including sources that are, in fact, aggregators of some MM sources**

UFA Goals

- **Consumers and Financial Institutions:**
 - **Can do what they do better**
 - **Can do things they could not do before**
 - **Redefine the use, role, and relationship of financial service**
- **Business-to-Business examples also**

41

Overview

- **Aggregator definition, types & examples**
- **Emerging Global Aggregation**
- **Enabling Technologies**
- **New Emerging Aggregators**
- **Strategy, Legal, Cultural, and Policy Issues**
- **Summary**

42

Strategy, Legal, Cultural, and Policy Issues Regarding Aggregation

- **Relationships between Aggregators and Aggregatees**
- **Protection of investment in data vs re-use**
 - **EU Database Directive**
 - **4 proposed bills in US**
- **Protection of consumer privacy**
- **Liability, consumer protection, jurisdiction**

43

www.intershipper.net

Home Register for an Account Login to an Account

Sign up for your FREE Intershipper account!

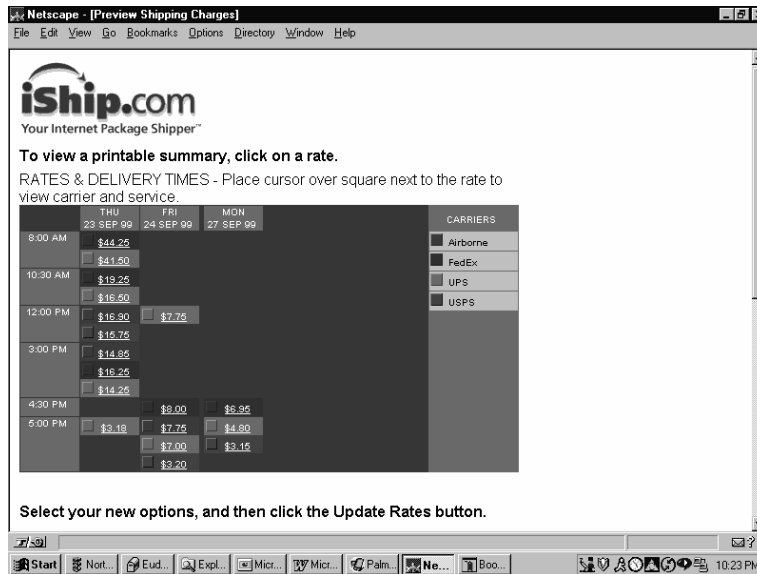
The information presented here is not completely accurate. It makes some assumptions which may not be correct and may affect your shipping cost. For a more accurate estimate, please register for a FREE Intershipper account.

Available Shipping Methods
Click on a column header to re-sort on that column

Shipping Method	Delivery Expected	Price
RPS Ground	Thursday, 9/23 (Guaranteed)	\$ 3.18
UPS Ground (Commercial)	Tomorrow, 9/22 (Guaranteed)	\$ 3.18
RPS 3-Day Guaranteed	Friday, 9/24 (Guaranteed)	\$ 4.80
UPS 3 Day Select	Friday, 9/24 (Guaranteed)	\$ 4.80
RPS - RPSAir	Thursday, 9/23 (Guaranteed)	\$ 5.95
FedEx Express Saver	Friday, 9/24 by 4:30 PM (Guaranteed)	\$ 6.95
UPS 2nd Day Air	Thursday, 9/23 (Guaranteed)	\$ 7.00
Airborne Second Day Service	Thursday, 9/23 by 5:00 PM (Guaranteed)	\$ 7.75
UPS 2nd Day Air A.M.	Thursday, 9/23 by 12:00 NOON (Guaranteed)	\$ 7.75
FedEx 2-Day	Thursday, 9/23 by 4:30 PM (Guaranteed)	\$ 8.00
UPS Next Day Air Saver	Tomorrow, 9/22 by 3:00 PM (Guaranteed)	\$ 14.25

44

www.iship.com



45

Aggregator “states” example

Intershipper

↓

Independent Agent (BITS, Inc.)

↓

Independent Aggregator

↓

Partial Collaborative Aggregator

iShip

↓

Dependent Aggregator/
Dominant (UPS)

↓

Dependent Aggregator / Consortium

46

Database Re-Use Lawsuits and Claims

• Example Cases

- eBay vs. Bidder's Edge
- HomeStore.com vs. Bargain Network
- First Union vs. PayTrust
- mySimon vs. Priceman
- Register.com vs. Verio
- Ticketmaster vs. Tickets.com

• Principles Used

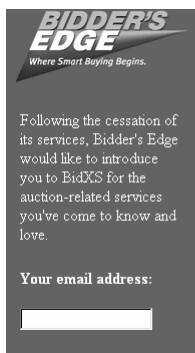
- Copyright infringement
- Trespass to chattels
- Breach of contract
- Misappropriation
- False advertising
- Violation of the Computer Fraud and Abuse Act
- ...

47

“ Copyright infringement ”

- Protects original works of authorship
- Usually not applicable to data re-use

“ Trespass to chattels ”



BidXS

BidXS welcomes Bidder's Edge users!

BidXS is all you have come to expect from a quality Auction Search-Engine, and is proud to pick up where Bidder's Edge left off. With BidXS you can:

- Search over 500 auction sites
- Use side-by-side mode for fast previews
- We search eBay tool
- Set up Item Watch to search automatically

- eBay vs. Bidder's Edge
 - Injunction on May 24, 2000

- Ticketmaster vs. Tickets.com
 - “it is hard to see how entering a publicly available web site could be called a trespass”

48

Battle over Database Re-Use - continued

☉ New Paradigm – “sweat of the brow”

- **Collections of Information Antipiracy Act, H.R.354 (1999) – Coble bill**
- **Consumer and Investor Access to Information Act of 1999, H.R. Rep.1858 (1999) – Bliley bill**
- **Two other failed bills in 1996, 1997**

- **EU Database Directive**

49

International Differences

U.S.

- ☉ **Decentralized**
- ☉ **Self- regulation**
- ☉ **No DB protection law**
- ☉ **Opt-out for privacy**

E.U.

- ☉ **Centralized**
- ☉ **Specific, strict regulation**
- ☉ **DB Directive**
- ☉ **Opt-in for privacy**

☉ **Reciprocity provision**

- **Not protected if home country does not have similar law for DB protection**
- **No data flow to countries without similar privacy protection law**

☉ **Harmonization is needed**

- 50
- **Safe Harbor Agreement between US and EU**

Overview

- **Aggregator definition, types & examples**
- **Emerging Global Aggregation**
- **Enabling Technologies**
- **New Emerging Aggregators**
- **Strategy, Legal, Cultural, and Policy Issues**
- **Summary**

51

Key Global Aggregation Insights & Implications

Insights

- **Everyone impacted**
- **Aggs not limited to price comparison**
- **Aggs can be combined and aggregated**
- **Aggs create new info spaces**
- **After-agg even more important**
- **New technologies emerging**
- **Business models and market conditions continue to change**

Implications

- **Be part of strategy planning**
- **Identify new Agg applications and business opportunities**
- **Entirely new types of applications can be defined**
- **Who will own this space**
- **This must be exploited**
- **Exploit these technologies**
- **Must be prepared for changes**

52

Current Related Projects (partial list)

- **Aggregation strategies (e.g., Open aggregation)**
- **Regional & Global Aggregation: Cultural & legal**
- **Multi-enterprise eBusiness: Trust & relationships**
- **Financial services/Internet support for SME's**
- **Future Financial Services (e.g., Wireless aggregator)**
- **Context Mediation & Web data extraction ***
- **Data Quality & What XML will and will not do**
- **Internal & Industry data standards efforts**
- **Other new technologies (e.g., Mobile aggregation)**

53

* Patents awarded in 1999

For Further Information and Contacts

⊛ **MIT Research:**

- <http://context2.mit.edu> and
<http://context2.mit.edu/aggregation>
- <http://web.mit.edu/tdqm>

⊛ **MIT Technology Licensed Software:**

- <http://web.mit.edu/smadnick/www/patents.html>

⊛ **Email Contact:**

- **Stuart Madnick at smadnick@mit.edu**
- **Michael Siegel at msiegel@mit.edu**

⊛ **Research funded, in part, by Fleet Bank, Merrill Lynch, Suruga Bank, Banco Santander (BSCH), Citibank, DoD Advanced Projects Agency (DARPA), MITRE Corporation, PricewaterhouseCoopers, Singapore-MIT Alliance (SMA),**

54 **MIT-Malaysia University of Science and Technology (MUST) Collaboration**