

Virtual World Accounting

James Grimmelmann
AAA Annual Meeting
August 8, 2007



It's all about the virtual property.

Today's topics:

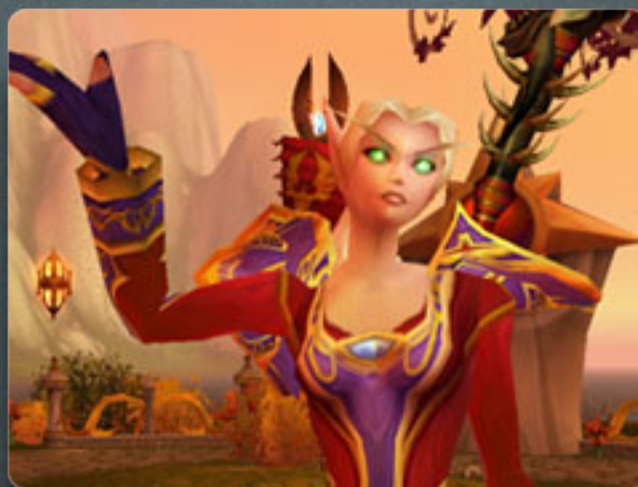
- **Raids**
- Exploits
- Markets



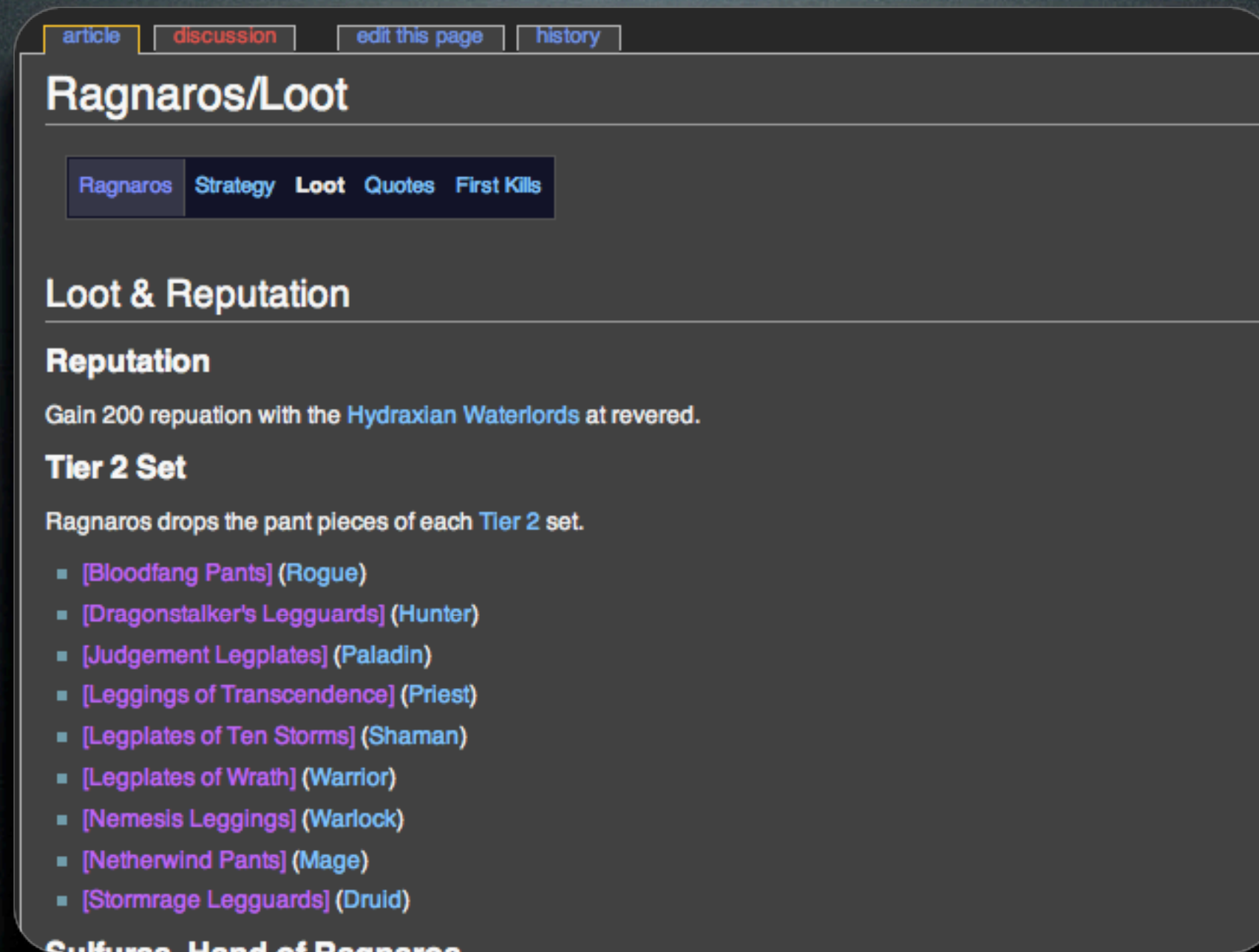
This is Ragnaros.



It takes a group of 40 players to kill him.



Killing him yields . . . pants



To be precise, one of nine different types of pants, each useful to different players.



Who gets the pants?

Filter:	None ▼								
		Name	Guild	Class	Earned	Spent	Adj	Current	Last Raid
1		Bauglir	<Class Lead>	Warlock	5094.74	3065.00	0.00	2029.74	01/13/07
2		Marvel	<Class Lead>	Rogue	4689.35	2935.00	0.00	1754.35	01/13/07
3		Theus	<Veteran>	Mage	3659.85	2075.00	0.00	1584.85	01/13/07
4		Dontfront	<Veteran>	Warlock	4703.40	3375.00	0.00	1328.40	01/13/07
5		Ridger	<Class Lead>	Mage	3661.08	2525.00	0.00	1136.08	01/13/07
6		Steelforever	<Veteran>	Rogue	4861.34	3875.00	0.00	986.34	01/13/07
7		Rubcant	<Veteran>	Hunter	4418.43	3485.00	0.00	933.43	01/13/07
8		Darkenessa	<Veteran>	Mage	3719.73	2910.00	100.00	909.73	01/02/07
9		Aragoth	<Veteran>	Warlock	3837.45	3250.00	100.00	687.45	01/13/07
10		BlaxIn	<Main>	Mage	2196.17	1585.00	0.00	611.17	01/13/07
11		Bonsal	<Main>	Mage	3389.67	2825.00	0.00	564.67	01/06/07
12		Randar	<Veteran>	Shaman	3123.46	2575.00	0.00	548.46	01/13/07
13		Ignight	<Main>	Warlock	2243.35	1725.00	0.00	518.35	01/13/07
14		Rotkeh	<Veteran>	Warlock	2270.74	1925.00	100.00	445.74	01/06/07
15		Jadan	<Veteran>	Rogue	5023.90	4595.00	0.00	428.90	01/13/07
16		Popotitos	<InterIm>	Mage	721.69	300.00	0.00	421.69	01/06/07
17		Babyleel	<Main>	Mage	2068.24	1750.00	100.00	418.24	01/06/07
18		Autopsy	<Main>	Priest	2260.18	1870.00	0.00	390.18	11/02/06
19		Noume	<Veteran>	Priest	3565.20	3200.00	-10.00	355.20	01/13/07

Solution: dragon kill points.

Members Present at Blackwing Lair on January 12, 2007					
Added By: Bauglir			Updated By: Bauglir		
Note: Firemaw			DKP Value: 4.49		
Attendees					
Aragoth	Ezzy	Irshish	Lushun	Randar	Theus
Arlakis	Ezzyanamaxis	Izualza	Mangar	Ridger	Tiny
Bauglir	Ghost	Jadan	Marvel	Rubcant	Wabbely
BlaxIn	Grooge	Joshuwan	Noume	Snotty	Wulph
Bullis	Gulseppe	Kalny	Odovazer	Steelforever	
Deviant	Humanshield	Kikashi	Organik	Strawlana	
Dontfront	Ignight	Lucindra	Paulle	Survey	
... found 39 attendee(s)					
Drops					
Buyer	Item				Spent
Ezzy	 Greaves of Ten Storms				175.00
... found 1 drop(s)					

Track participation . . .

Here is the current Price List for the Months Behind Alliance. Please post any questions or concerns at the [forums](#).

Item Name	Item Price
Aged Core Leather Greaves	40
Ancient Cornerstone Grimoire	100
Ancient Petrified Leaf	20
Arcanist Belt	80
Arcanist Bindings	80
Arcanist Boots	100
Arcanist Gloves	100
Arcanist Crown	120
Arcanist Leggings	120
Arcanist Mantle	120
Arcanist Robes	140
Aurastone Hammer	240
Azuresong Mageblade	260
Band of Accuria	120
Band of Sulfuras	120
Belt Of Might	80
Belt Of Ten Storms	180
Belt Of Transcendence	180
Bindings Of Transcendence	180
Bindings Of Wind Seeker	20

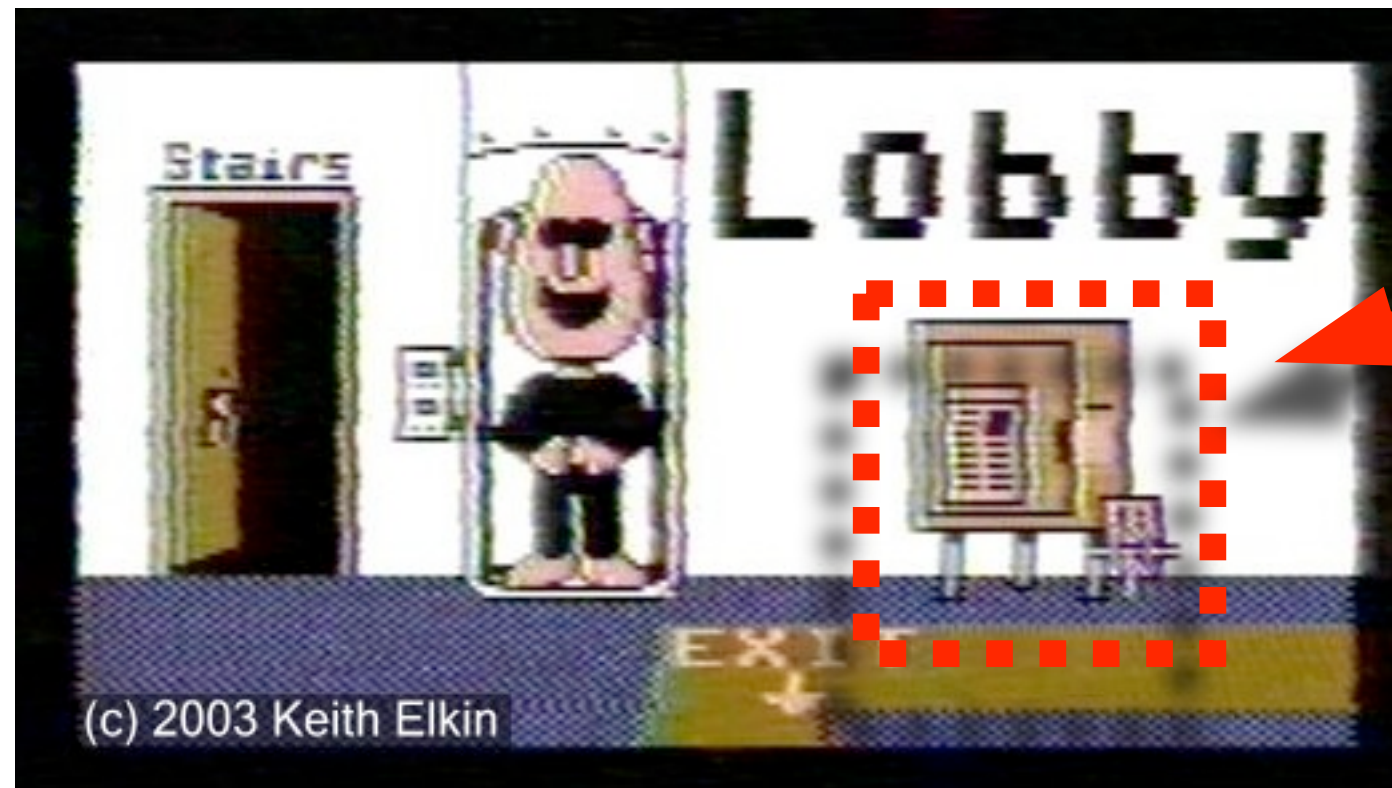
... assign values to items ...

Show DKP2 v0.80				
Player name		All	DKP	Bid
bid	Crystus	Unknown	8.10	8.10
bid	Anaseo	Rogue	2.02	2.02
bid	Garidium	Shaman	-11.57	-11.57
greed	Aberforth	Mage	4.08	0.00
greed	Aladdin	Warrior	2.33	0.00
greed	Albatros	Warlock	3.55	0.00
need	Alfonze	Druid	-4.00	0.00
need	Anarchie	Priest	2.88	0.00
greed	Andural	Unknown	1.53	0.00
greed	Anirosa	Unknown	13.63	0.00
greed	Asarruk	Hunter	1.92	0.00
greed	Ashtan	Priest	2.11	0.00
greed	Azhan	Rogue	2.55	0.00
Updated: 00:52 12/06/07			Total/Checked/DKP Range: 268/3/0	
Name:			<input type="checkbox"/> Raid Only	<input type="checkbox"/> Bids Only
SWotH			Announce	Reset

... and have players bid on the loot.

Today's topics:

- Raids
- **Exploits**
- Markets

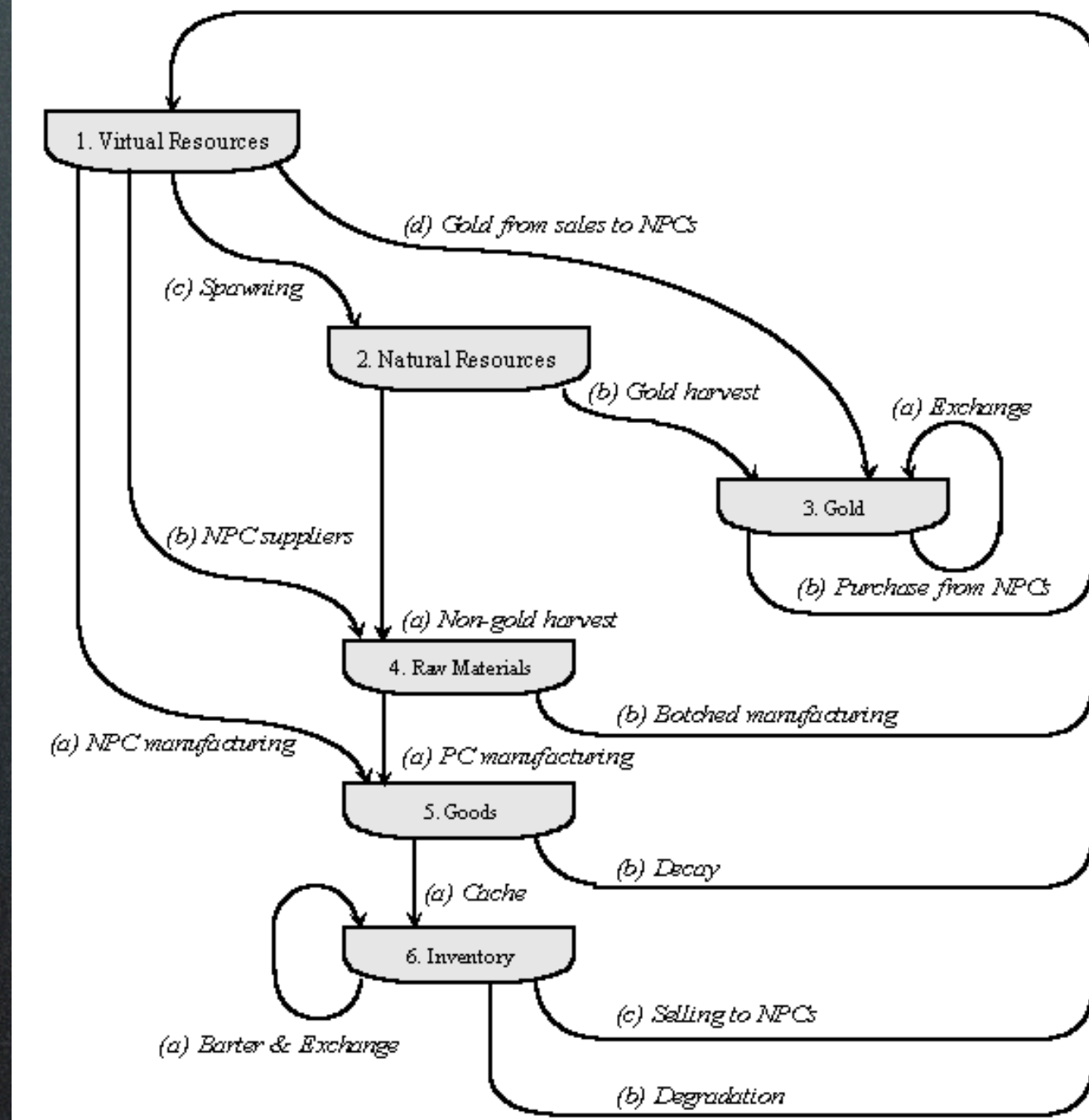


Designed economies sometimes have bugs.



Mistakes are ruthlessly exploited.

Original Economic Flow



Where do all the resources wind up?



What to do with the tons of raw data?

Today's topics:

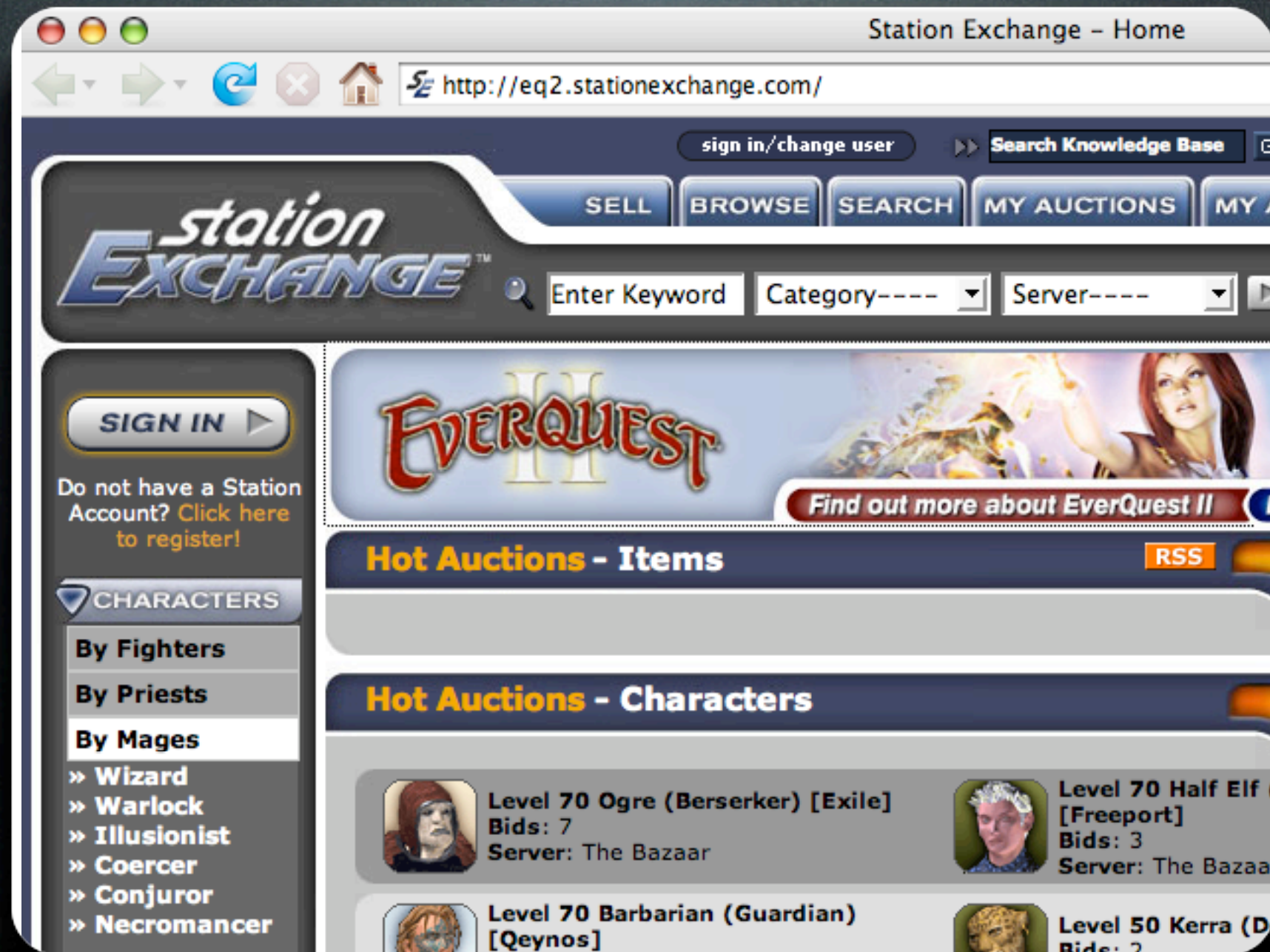
- ~~Raids~~
- ~~Exploits~~
- **Markets**




For World of Warcraft, there's the Auction House.



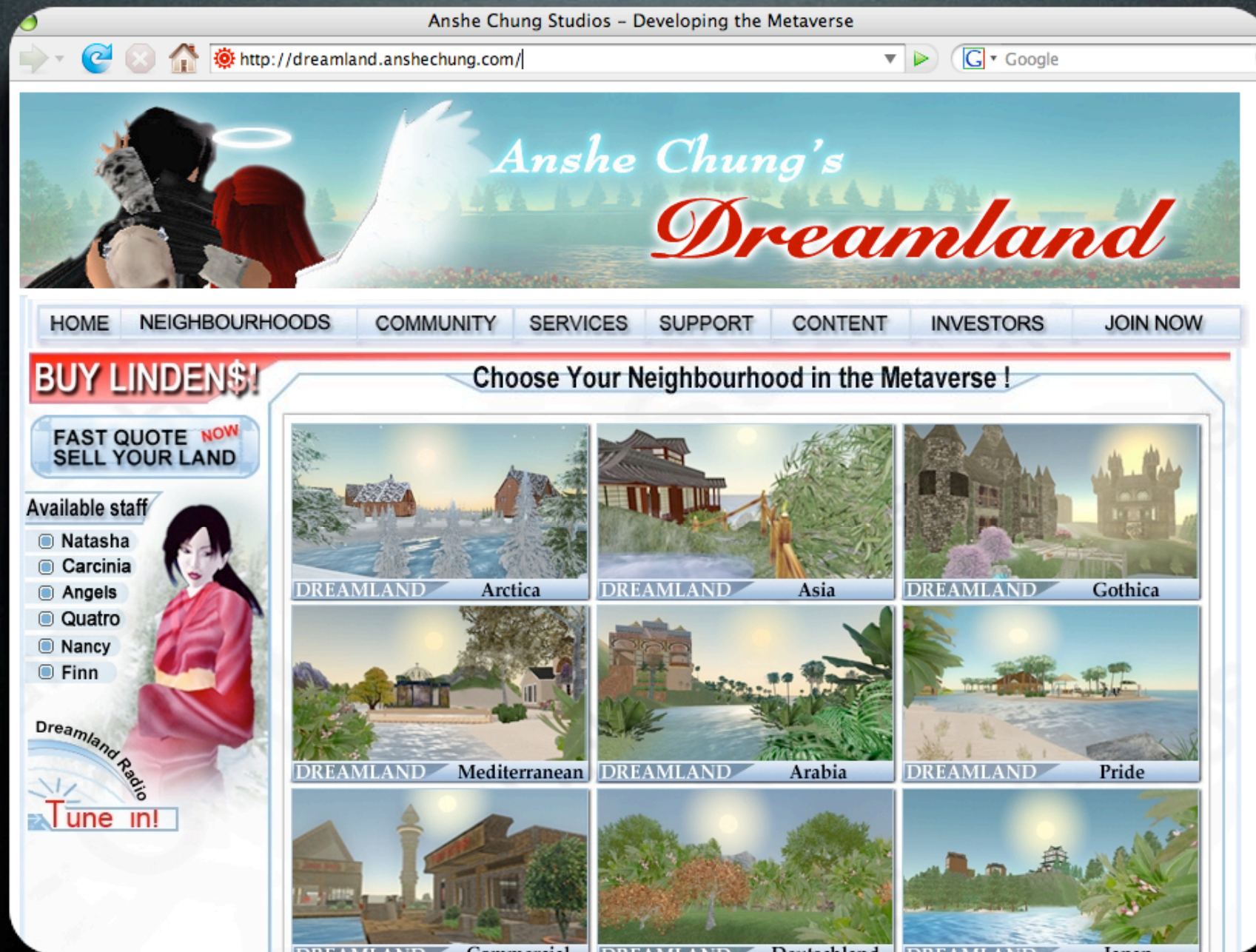
It's official and in-world.



For EverQuest II, there's StationExchange.

Search Results								
Home » EverQuest II » Search Results								
1 of 1								
	Lvl (Lvl)	Class (Trade)	Race	City	Server	Price	#Bids	Time Left ▼
	66 (1)	Warlock (Unskilled)	High Elf	Qeynos	Vox	\$44.00 Buy Now @ \$175.00	2	1d 10h 8m 26s
	67 (65)	Warlock (Provisioner)	Erudite	Freeport	The Bazaar	\$50.00 Buy Now @ \$800.00	2	2d 14h 1m 26s
	47 (10)	Warlock (Scholar)	Ratonga	Freeport	The Bazaar	\$50.00 Buy Now @ \$100.00	0	2d 14h 46m 26s
	70 (3)	Warlock (Artisan)	Froglok	Qeynos	The Bazaar	\$51.00 Buy Now @ \$250.00	1	2d 15h 33m 26s
	70 (12)	Warlock (Scholar)	Human	Freeport	The Bazaar	\$175.00 Buy Now @ \$225.00	0	4d 19h 44m 26s
	70 (40)	Warlock (Sage)	Erudite	Qeynos	The Bazaar	\$265.00 Buy Now @ \$289.00	0	5d 20h 31m 26s
	26 (2)	Warlock (Artisan)	Fae	Kelethin	The Bazaar	\$2.00 Buy Now @	0	9d 21h 9m 26s

It's official, but all sales are in US\$.



For Second Life, there's Anshe Chung, virtual land baron, real millionaire.



(Plus tons of in-world stores.)

Saved searches:

Bids Search

Save

Delete

Qty	Name	Time Left	Bid	Profit
1	Green Helper Box	Medium	1 10	2 9
1	Red Helper Box	Medium	23 10	1 83
1	Pattern: Deviate Scal...	Medium	2 20 0	15 65
15	Coarse Stone	Short	45 97	1 86
1	Formula: Lesser Wiza...	Short	55 0	1 15
1	Councillor's Cloak of ...	Medium	1 31 4	2 36
1	Murphstar of Power	Short	80 0	1 11
1	Recipe: Giant Clam S...	Medium	1 18 75	1 66
1	Green Helper Box	Medium	1 1 0	1 9
1	Heavy Scorpion Belt	Short	1 55 62	1 60
1	Heavy Scorpion Belt	Short	1 55 62	1 60
1	Heavy Scorpion Belt	Short	1 55 62	1 60
1	Heavy Scorpion Belt	Short	1 55 62	1 60
1	Schematic: Thorium ...	Short	1 45 0	1 40
1	Schematic: Thorium ...	Medium	1 45 0	1 41
1	Plans: Mithril Scale Br...	Short	4 22 50	3 42
200	Rockshard Pellets	Medium	4 15 0	3 19
2	Stonescale Oil	Medium	2 3 75	1 58
1	Schematic: Powerful ...	Short	2 60 0	1 20

All bid requests complete!

Bid

Buy


All this trading generates reams of data, which players are analyzing in ad hoc ways.

EVE-MEEP

File Edit Tools Help

Salvis Tallan

Skills Inventory Tech 1 Industry Calculator Tech 2 Industrial Calculator Mining POS Cost Calculator Reprocessing



Details

Dominix Blueprint

Production Time: 240 Mins

Cost Per Hour: 333

Blueprint Research

0 Production Efficiency

3 Materials Efficiency

Graph

Blueprint Cost: 625,000,000.00

Your Skills

5 Industry

4 Refining

0 Refining Efficiency

3 Production Efficiency

0 Accounting

Dominix Blueprint Amount of Runs: 1

Estimated Sell Price: 62000000

☐ Perfect ☒ Adjusted

Needed Materials

Tritanium:	4838444
Pyerite:	1210380
Mexallon:	304768
Isogen:	75823
Nocxium:	18888
Zydrine:	4324
Megacyte:	1582
Morphite:	0

Buy Prices

Single Price	Total Price
2	9,676,888.00
4.1	4,962,558.00
14	4,266,752.00
110	8,340,530.00
440	8,310,720.00
4200	18,160,800.00
4600	7,277,200.00
14500	0.00

Sell Prices

Single Price	Total Price
2	9,676,888.00
4.1	4,962,558.00
14	4,266,752.00
110	8,340,530.00
440	8,310,720.00
4200	18,160,800.00
4600	7,277,200.00
14500	0.00

Summary

Total Amount Produced: 1.00

Total Materials Cost: -60,995,448.00

Production Costs: -2,332.00

Estimated Total Sales: 62,000,000.00

Profit: 1,002,220.00

Taxes: -10,022.20

Blueprint Cost: -625,000,000.00

Total Manufacture Profit: -624,007,802.20

Runs Until Profit: 623

Minimum Sell Price: 564,002,220.00

Total Sell Mineral Profit: 54,798,388.00

Here's a profit/loss scenario planner from EVE Online.

Accountant q2.0		
Revenue:	3g 47s 42c	
Expenditures:	29g 32s 59c	
Net Loss:	25g 85s 17c	Reset
Source	Revenue	Expenditures
Training Costs		
Taxi Fares		
Trade Window		
Auction House	3g 12s 61c	
Unknown		25g
Merchants	34s 81c	
Repair Costs		4g 31s 39c
Mail		1s 20c

Here's a ledger from World of Warcraft.

LindeX Market Data



Show: [7 days](#) [14 days](#) [30 days](#) [90 days](#) [all](#)

Daily Summary:

Last Close Date 2006-07-09

Best buying rate: L\$299 / US\$1.00

Best selling rate: L\$312 / US\$1.00

Last trade: L\$299 / US\$1.00

Last close: L\$299 / US\$1.00

Change: L\$0 / US\$1.00

Today's volume: L\$1,516,262

Today's open: L\$299 / US\$1.00

Today's high: L\$313 / US\$1.00

Today's low: L\$298 / US\$1.00

Today's average: L\$300.9432 / US\$1.00



Daily Market History - Rates are in L\$ per US\$1.00. Volume and quantities are in L\$.

Date	Open Rate	Close Rate	Volume	Min Rate	Avg Rate	Max Rate	Min Qty	Avg Qty	Max Qty
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Here's some historical market data from Second Life.

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Practice is outrunning
theory.

So go catch up!

Colophon

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