GeniusWeb
Agent Development

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ÖZYEĞİN
ÜNİVERSİTESİ

Negotiation Components

Domain

Ex: Laptop Domain

ISSUE:	Brand			Harddisk			External Monitor		
VALUE:	Dell	Macintosh	HP	128 GB	512 GB	2 TB	19inch HD	32inch 4K	55inch 8K

```
{
   name: "laptop",
 - issuesValues: {
    - Brand: {
       - values: [
            "Dell",
            "Macintosh",
            "HP"
         ]
      },
    - Harddisk: {
       - values: [
            "128 GB",
            "512 GB",
            "2 TB"
         ]
      },
    - External Monitor: {
       - values: [
            "19inch HD",
            "32inch 4K",
            "55inch 8K"
         ]
      }
   }
}
```

Bid

Ex: Laptop Domain

ISSUE:	Brand			Harddisk			External Monitor		
VALUE:	Dell	Macintosh	HP	128 GB	512 GB	2 TB	19inch HD	32inch 4K	55inch 8K

Bid 1

ISSUE:	Brand	Harddisk	External Monitor
VALUE:	Dell	128 GB	55inch 8K

Bid 2

ISSUE:	Brand	Harddisk	External Monitor
VALUE:	Macintosh	2 TB	19inch HD

Agent

Bilateral negotiation is a process of making offers and counter offers by the two parties of agents with the aim of finding an acceptable agreement.

Agent 1

Agent 2

Source: https://www.igi-global.com/dictionary/bilateral-negotiation/2433

Profile (Utility Space)

Ex: Laptop Domain

ISSUE:	Brand			Harddisk			External Monitor		
VALUE:	Dell	Macintosh	HP	128 GB	512 GB	2 TB	19inch HD	32inch 4K	55inch 8K

Profile 1

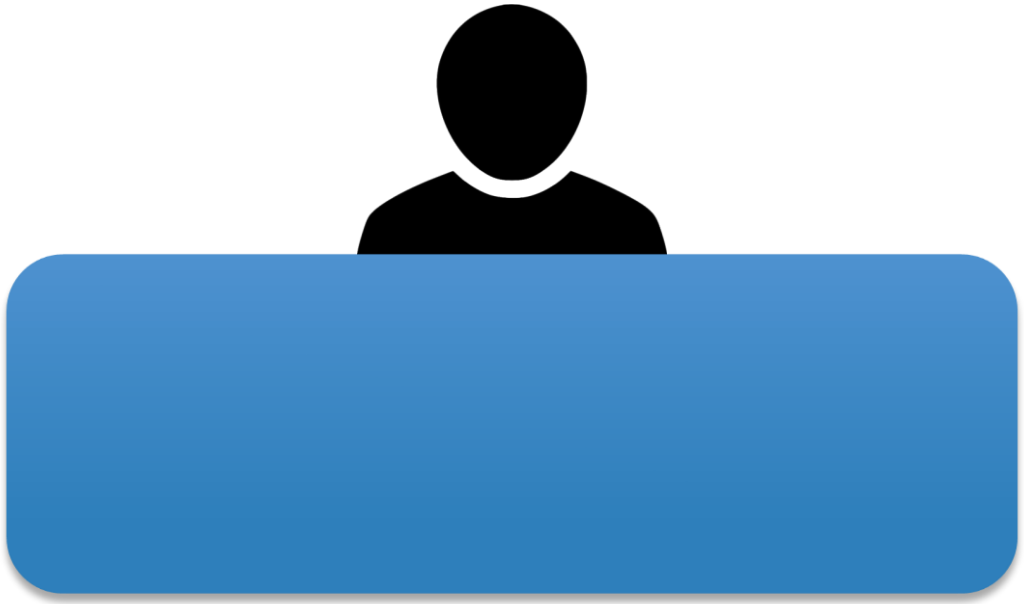
BID			UTILITY
Dell	128 GB	19inch HD	0.97
Dell	128 GB	32 inch 4K	0.96
Dell	512 GB	19inch HD	0.94
Dell	2 TB	55inch 8K	0.91
HP	128 GB	32inch 4K	0.85
Macintosh	128 GB	19inch HD	0.78
…	…	…	…

Profile 2

BID			UTILITY
Dell	128 GB	19inch HD	0.92
Dell	128 GB	32 inch 4K	0.76
Dell	512 GB	19inch HD	0.69
Dell	2 TB	55inch 8K	0.89
HP	128 GB	32inch 4K	0.98
Macintosh	128 GB	19inch HD	0.87
…	…	…	…

SAOP Protocol

SAOP allows **negotiating** agents to evaluate only the most recent bid in their turn and accordingly they can either accept that bid or make a counter offer or walk away.



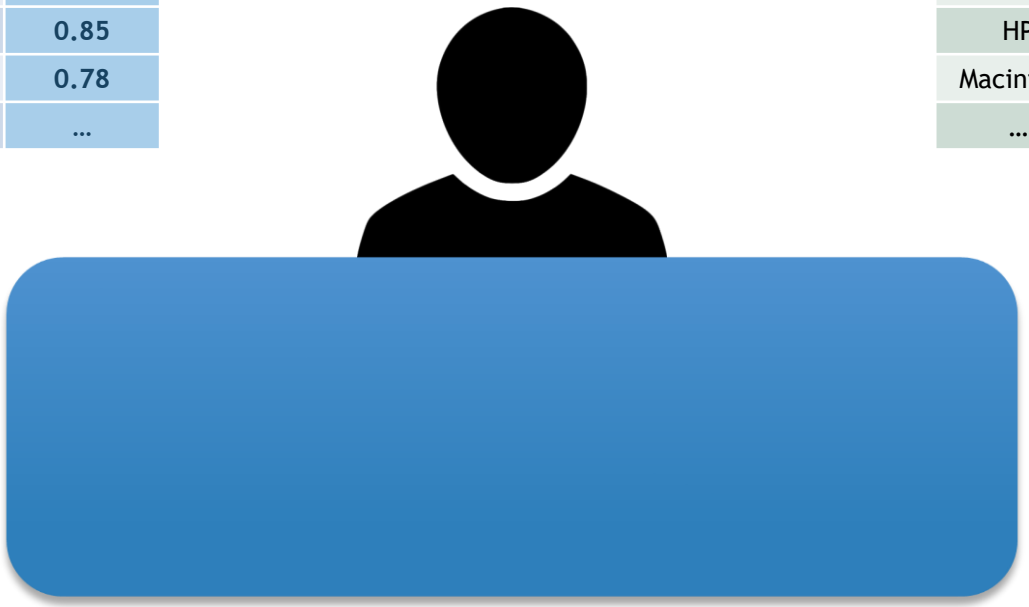
Source: https://link.springer.com/chapter/10.1007/978-3-319-51563-2_10

Negotiation Session

BID			UTILITY
Dell	128 GB	19inch HD	0.97
Dell	128 GB	32 inch 4K	0.96
Dell	512 GB	19inch HD	0.94
Dell	2 TB	55inch 8K	0.91
HP	128 GB	32inch 4K	0.85
Macintosh	128 GB	19inch HD	0.78
...	...	...	...

Round: 0 / 4
Time: 0

BID			UTILITY
Dell	128 GB	19inch HD	0.92
Dell	128 GB	32 inch 4K	0.76
Dell	512 GB	19inch HD	0.69
Dell	2 TB	55inch 8K	0.89
HP	128 GB	32inch 4K	0.98
Macintosh	128 GB	19inch HD	0.87
...	...	...	...



Agent 1

Utility: N/A

Agent 2

Utility: N/A

Negotiation Session

BID			UTILITY
Dell	128 GB	19inch HD	0.97
Dell	128 GB	32 inch 4K	0.96
Dell	512 GB	19inch HD	0.94
Dell	2 TB	55inch 8K	0.91
HP	128 GB	32inch 4K	0.85
Macintosh	128 GB	19inch HD	0.78
...	...	...	...

Round: 1 / 4
Time: 0.25

BID			UTILITY
Dell	128 GB	19inch HD	0.92
Dell	128 GB	32 inch 4K	0.76
Dell	512 GB	19inch HD	0.69
Dell	2 TB	55inch 8K	0.89
HP	128 GB	32inch 4K	0.98
Macintosh	128 GB	19inch HD	0.87
...	...	...	...

ISSUE:	Brand	Harddisk	External Monitor
VALUE:	Dell	128 GB	19inch HD

Agent 1

Utility: 0.97

Agent 2

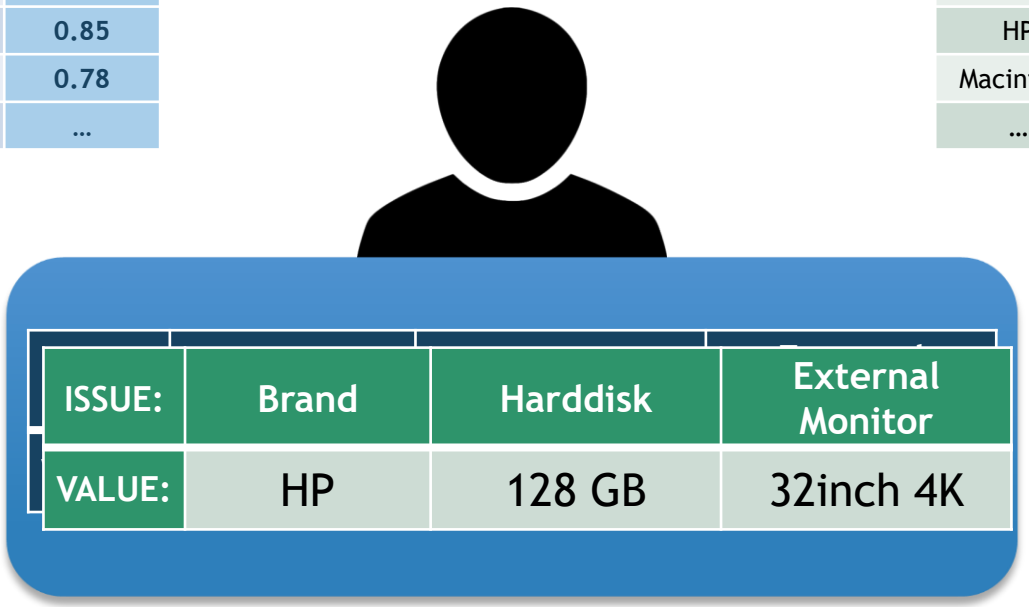
Utility: 0.92

Negotiation Session

BID			UTILITY
Dell	128 GB	19inch HD	0.97
Dell	128 GB	32 inch 4K	0.96
Dell	512 GB	19inch HD	0.94
Dell	2 TB	55inch 8K	0.91
HP	128 GB	32inch 4K	0.85
Macintosh	128 GB	19inch HD	0.78
...	...	...	...

Round: 2 / 4
Time: 0.5

BID			UTILITY
Dell	128 GB	19inch HD	0.92
Dell	128 GB	32 inch 4K	0.76
Dell	512 GB	19inch HD	0.69
Dell	2 TB	55inch 8K	0.89
HP	128 GB	32inch 4K	0.98
Macintosh	128 GB	19inch HD	0.87
...	...	...	...



ISSUE:	Brand	Harddisk	External Monitor
VALUE:	HP	128 GB	32inch 4K

Agent 1

Utility: 0.85

Agent 2

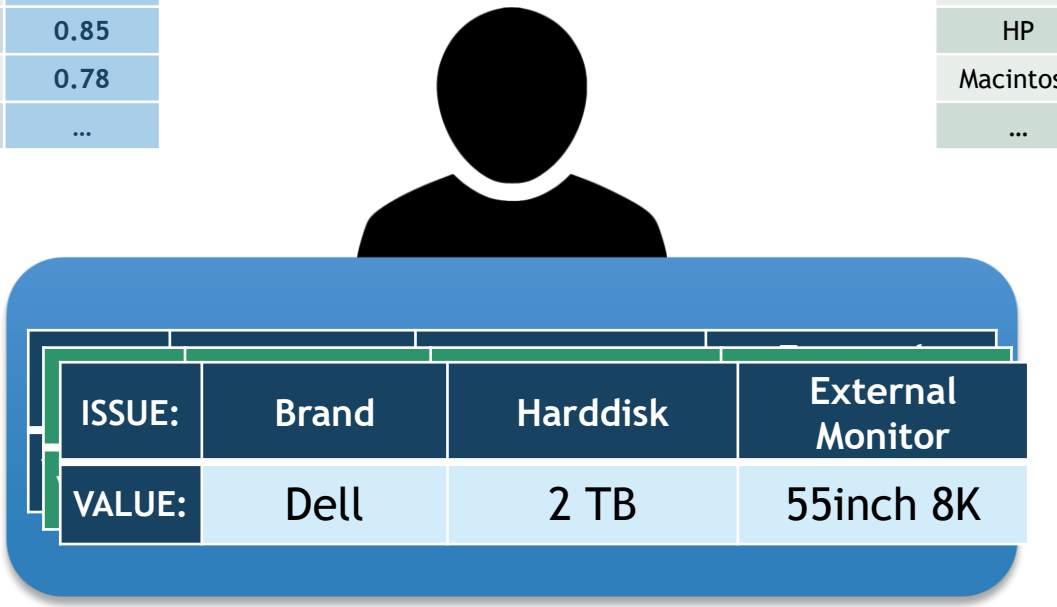
Utility: 0.98

Negotiation Session

BID			UTILITY
Dell	128 GB	19inch HD	0.97
Dell	128 GB	32 inch 4K	0.96
Dell	512 GB	19inch HD	0.94
Dell	2 TB	55inch 8K	0.91
HP	128 GB	32inch 4K	0.85
Macintosh	128 GB	19inch HD	0.78
...	...	...	...

Round: 3 / 4
Time: 0.75

BID			UTILITY
Dell	128 GB	19inch HD	0.92
Dell	128 GB	32 inch 4K	0.76
Dell	512 GB	19inch HD	0.69
Dell	2 TB	55inch 8K	0.89
HP	128 GB	32inch 4K	0.98
Macintosh	128 GB	19inch HD	0.87
...	...	...	...



ISSUE:	Brand	Harddisk	External Monitor
VALUE:	Dell	2 TB	55inch 8K

Agent 1

Utility: 0.91

Agent 2

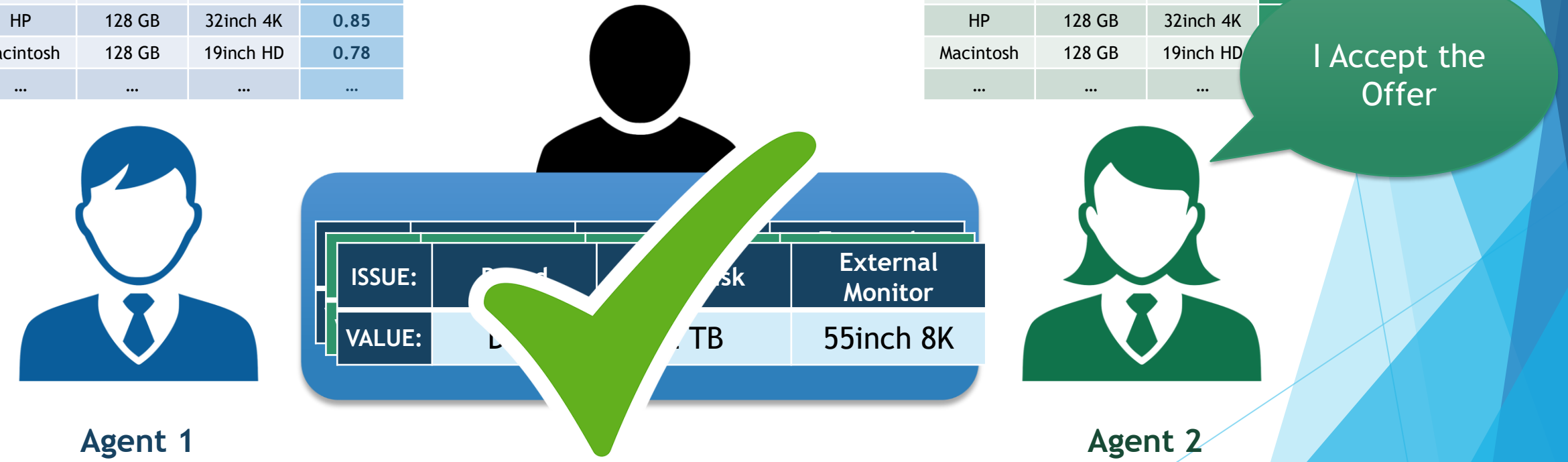
Utility: 0.89

Negotiation Session

BID			UTILITY
Dell	128 GB	19inch HD	0.97
Dell	128 GB	32 inch 4K	0.96
Dell	512 GB	19inch HD	0.94
Dell	2 TB	55inch 8K	0.91
HP	128 GB	32inch 4K	0.85
Macintosh	128 GB	19inch HD	0.78
...	...	...	...

Round: 3 / 4
Time: 0.75

BID			UTILITY
Dell	128 GB	19inch HD	0.92
Dell	128 GB	32 inch 4K	0.76
Dell	512 GB	19inch HD	0.69
Dell	2 TB	55inch 8K	0.[illegible]
HP	128 GB	32inch 4K	[illegible]
Macintosh	128 GB	19inch HD	[illegible]
...	...	...	...



Agent 1

Utility: 0.91

Agent 2

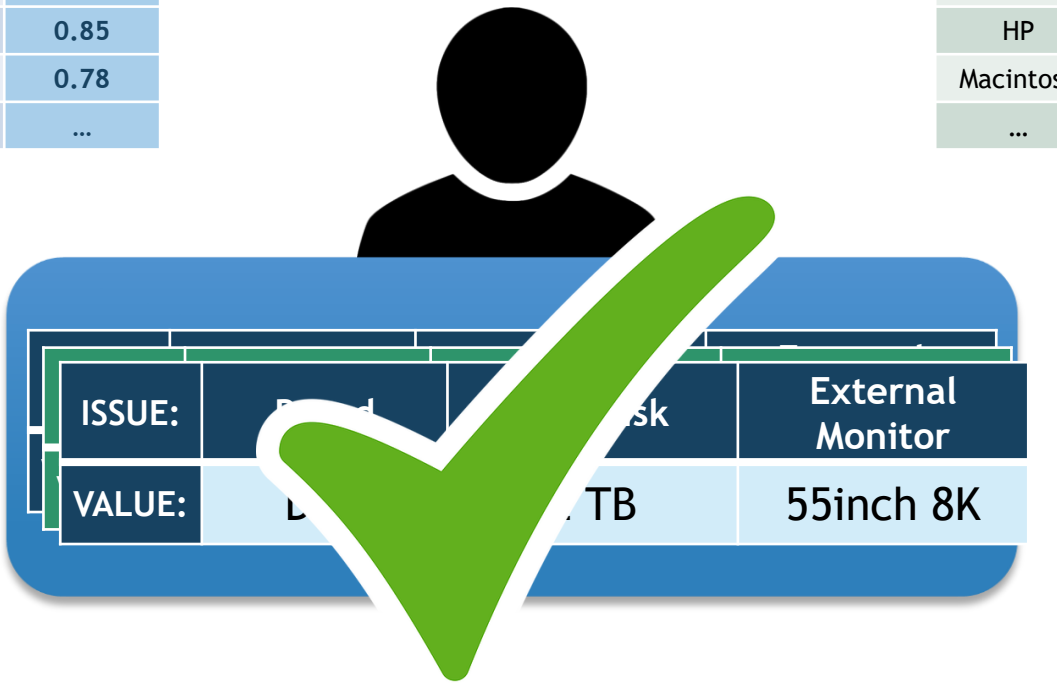
Utility: 0.89

Negotiation Session

BID			UTILITY
Dell	128 GB	19inch HD	0.97
Dell	128 GB	32 inch 4K	0.96
Dell	512 GB	19inch HD	0.94
Dell	2 TB	55inch 8K	0.91
HP	128 GB	32inch 4K	0.85
Macintosh	128 GB	19inch HD	0.78
...	...	...	...

Round: 3 / 4
Time: 0.75

BID			UTILITY
Dell	128 GB	19inch HD	0.92
Dell	128 GB	32 inch 4K	0.76
Dell	512 GB	19inch HD	0.69
Dell	2 TB	55inch 8K	0.89
HP	128 GB	32inch 4K	0.98
Macintosh	128 GB	19inch HD	0.87
...	...	...	...



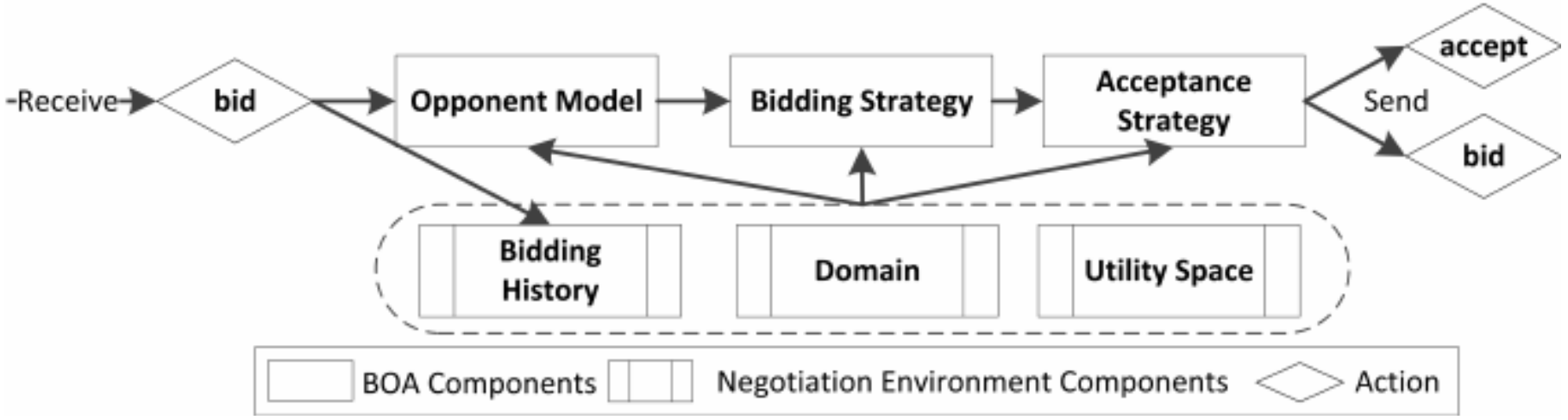
Agent 1

Utility: 0.91

Agent 2

Utility: 0.89

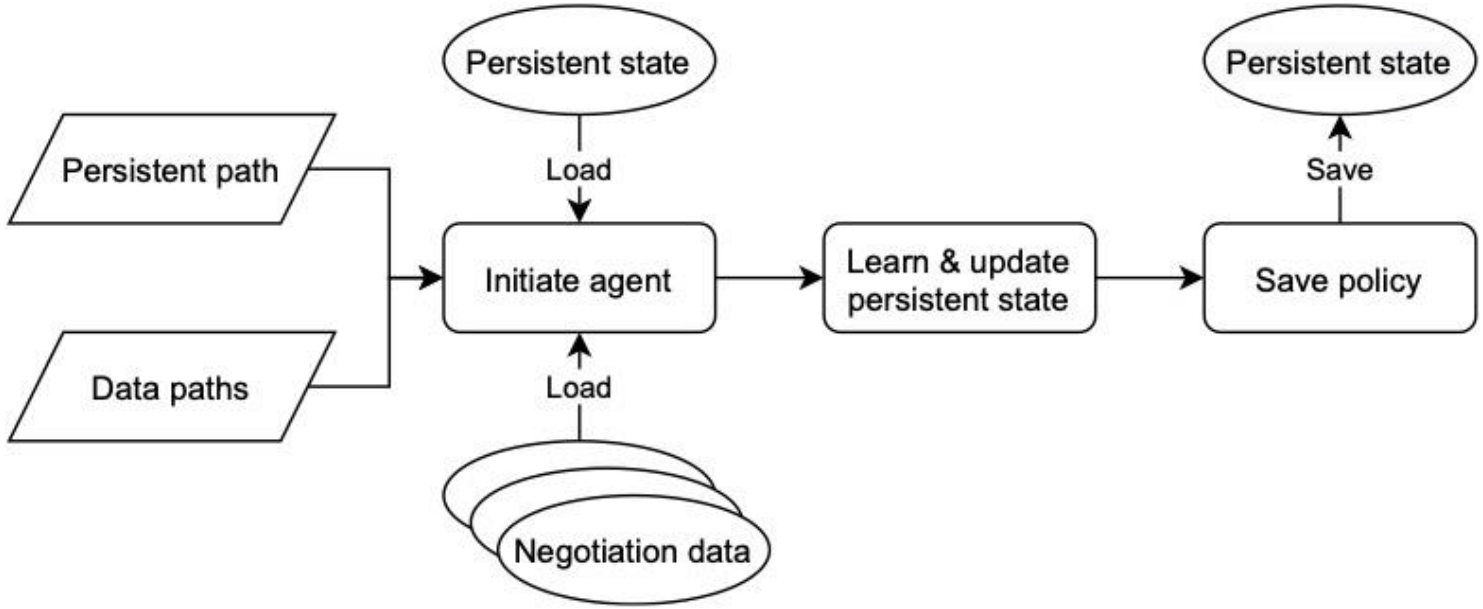
BOA Architecture Negotiation Flow



Bidding Strategy / **O**pponent Model / **A**cceptance Strategy

Source: https://www.researchgate.net/figure/The-BOA-architecture-negotiation-flow_fig1_263157273

Learning



Source: http://web.tuat.ac.jp/~katfuji/ANAC2021/genius.html

ANAC 2021 Example Agent GitHub: https://github.com/brenting/ANL-2021-example-agent

Agent Implementation

MyAgent GitHub Repository: https://github.com/abyildirim/geniusweb-tutorial

Thanks

For Watching