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*Experience Navigator*  
AnyLogic Conference  
Presentation  
December 12, 2013

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## ***Micromotives and macrobehavior***

*The aggregation of (generally rational) behavior of individuals at the micro-level, leads to (often unpredictable) emergent behavior on the macro-level*

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## *Limitations of Marketing Mix Models*

1. Aggregation of customers into a single regression equation
2. No explicit interaction between customers
3. No explicit representation of consumer decision making  
    No memory or history
4. Non-linear relationships not accounted for
5. Data limited to time series
6. Short time horizon

## *The Experience Navigator platform*

Brings sophisticated simulation modeling and visualization to answer four key questions facing today's CMO

Which **attributes of experience** are most important to my consumers and intermediaries?

**How long** will it take to realize a **change in consumer or intermediary behavior**?

What is the **optimal price** for the experience my product/service provides?

How much **top-line revenue growth** will a change in **experience** generate?



# ***Managing brand sentiment for an Airline firm***

## Problem statement and model purpose

### **Problem Statement**

Our client was facing a situation where opportunities to extend existing strategy are limited, coupled with an increasing cost structure due to competition, commodity prices, and acquisition integration activities. They wanted to explore several opportunities to generate new profits through ancillary products or changes to existing policies, and would like to quantify perceived impact to its “brand equity” and market share.

### **Model Purpose**

The goal of this effort is to model the predicted impact to the client’s ticket market share and company brand sentiment after introducing new products or policy changes. This effort uses historical industry data, Behavioral Economics principles, and measurable experiences to create a behavioral model to help understand the impact on Customers’ purchase behavior and Airline’s social contract.

## Case study: Airlines client

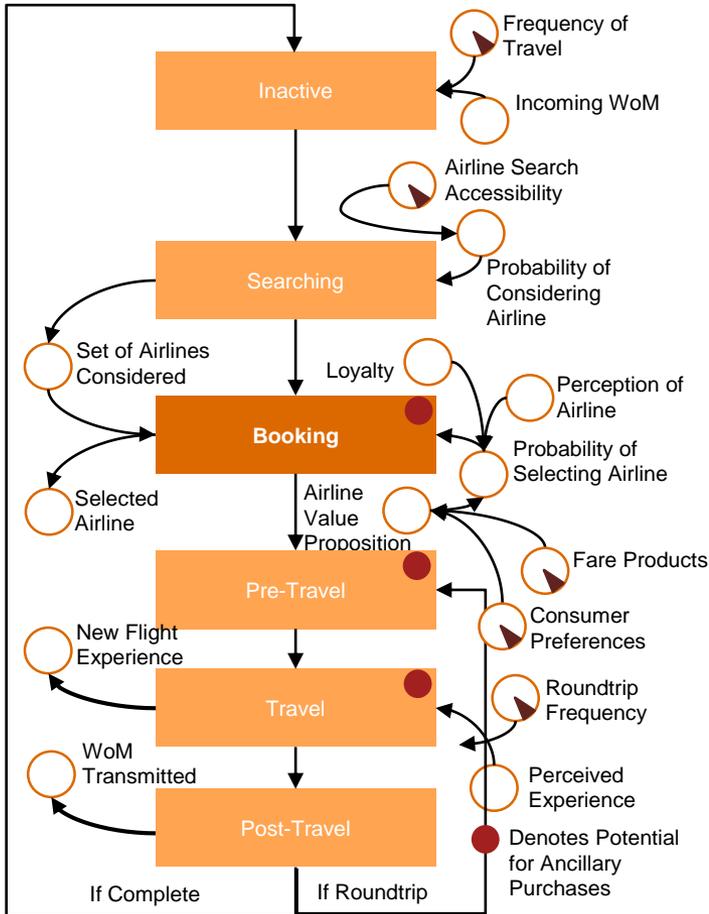
Model Ecosystem – We will explore the consumer flight process in detail



Component	Description	Types
Airlines	US domestic airline carriers	<ul style="list-style-type: none"> <li>Client firm with decision inputs</li> <li>Competitor Airline representing the aggregation of all other competitors in the market</li> </ul>
Consumers	Potential flyers, divided by segment	<ul style="list-style-type: none"> <li>Business/Leisure Flyer</li> <li>Frequent/Infrequent Flyer</li> </ul>
<i>Consumer Flight Process</i>	<i>Process a consumer undergoes to travel</i>	<ul style="list-style-type: none"> <li><i>Inactive</i></li> <li><i>Searching</i></li> <li><i>Booking</i></li> <li><i>Pre-Travel</i></li> <li><i>Travel</i></li> <li><i>Post-Travel</i></li> </ul>
Ancillary Purchase Process	Process to purchase ancillary products/initiatives	<ul style="list-style-type: none"> <li>Inactive</li> <li>Event Occurrence</li> <li>Purchase Decision</li> </ul>
WoM Transmission Process	Process to tell others of prior experiences	<ul style="list-style-type: none"> <li>Inactive</li> <li>Prompt</li> <li>Recall</li> <li>Transmit</li> </ul>

# Case study: Airlines client

## Consumer flight selection process – We will explore the booking in detail



### Inactive

- The consumer stays inactive until he decides to take a flight
- During this time he may still send and receive word of mouth and other messages which affect his perception of airlines

### Searching

- A consumer's likelihood to search an airline for a ticket quote is based on the airline's search accessibility
- Consumers are "batch" shoppers—aggregating a set of quotes before deciding which ticket to buy

### Booking

- The consumer reviews his consideration set of airlines considered and probability is developed for the consumer to select a given airline
- This probability is derived from the value a consumer expects to receive from the airline, which is a function of the airline's offerings, the consumer's preferences, his past experiences, the word of mouth collected, and the consumer's loyalty
- Whenever a consumer decides to fly, he books a ticket 100% of the time

### Pre-Travel

- Consumers may decide to make ancillary purchases/changes to his flight based on his preferences, the product's cost, and the potential value gained
- In addition, events may occur that prompt these purchases

### Travel

- The consumer perceives a flight experience which is stored in his memory and affects repurchase behavior
- The consumer's perception of experience is influenced by the experience delivered as well as his expectations
- Events may occur that prompt potential ancillary purchases

### Post-Travel

- Consumers may discuss their past experiences with others

## ***Case study: Airlines client***

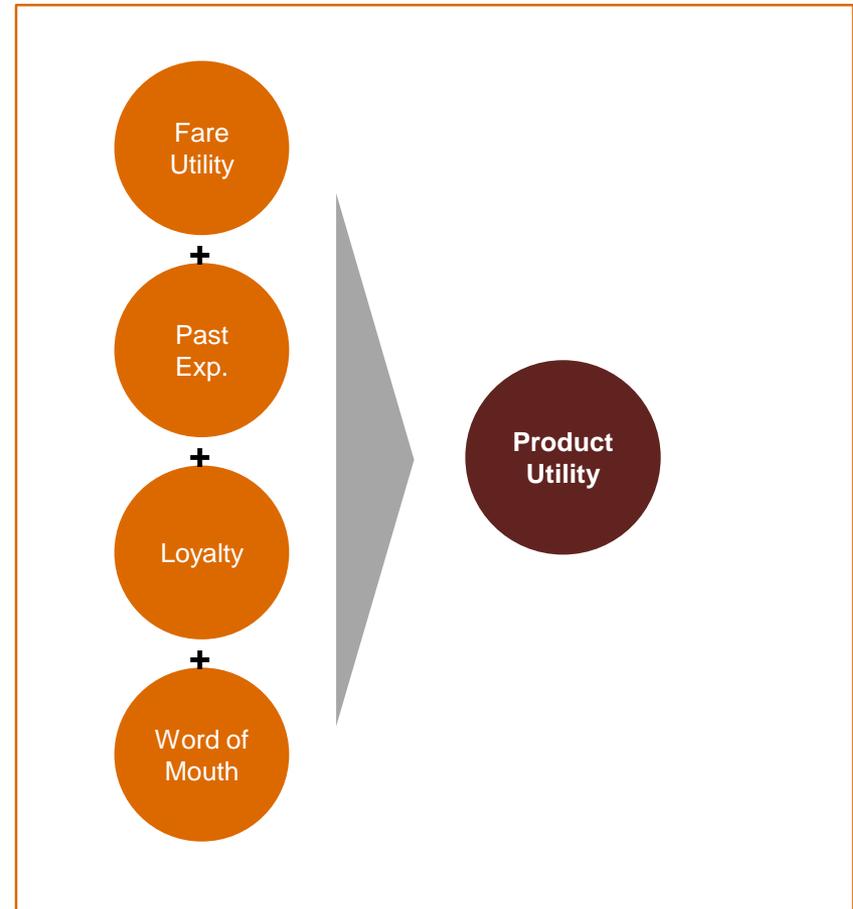
Consumer purchase decisions are decomposed into four factors

**Fare Utility:** Value proposition for the Customer; includes a combination of product features, such as availability, comfort, convenience, and price

**Past Experiences:** Collection of positive and negative “memories” of a Customer’s travel experience

**Loyalty:** Made up of two components, the first being the percent of time the Customer flies a particular airline, and the second being the very last airline flown

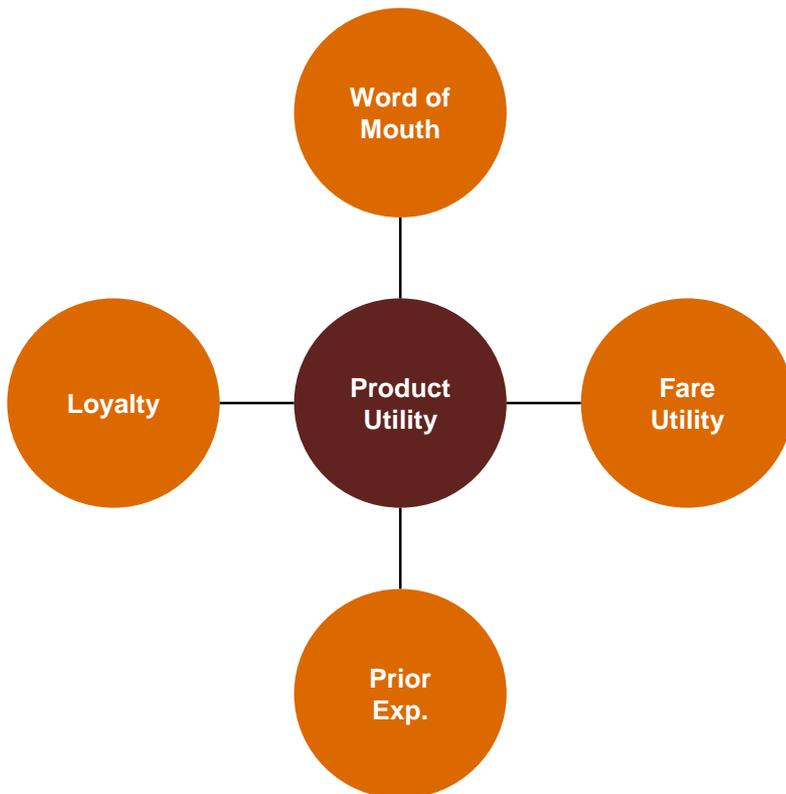
**Word of Mouth:** Frequency and magnitude of the “memories” passed from one Customer to another; can include one-to-one and one-to-many interactions



## ***Case study: Airlines client***

Policy changes and new products will have both direct and indirect impacts on consumer behavior

### **Model Interactions**



### **Initiative Impacts**

**Direct Impacts:** New products and policy changes affect the product value through:

- Product Changes
- One-time Perception Shocks
- Ongoing Experience Changes

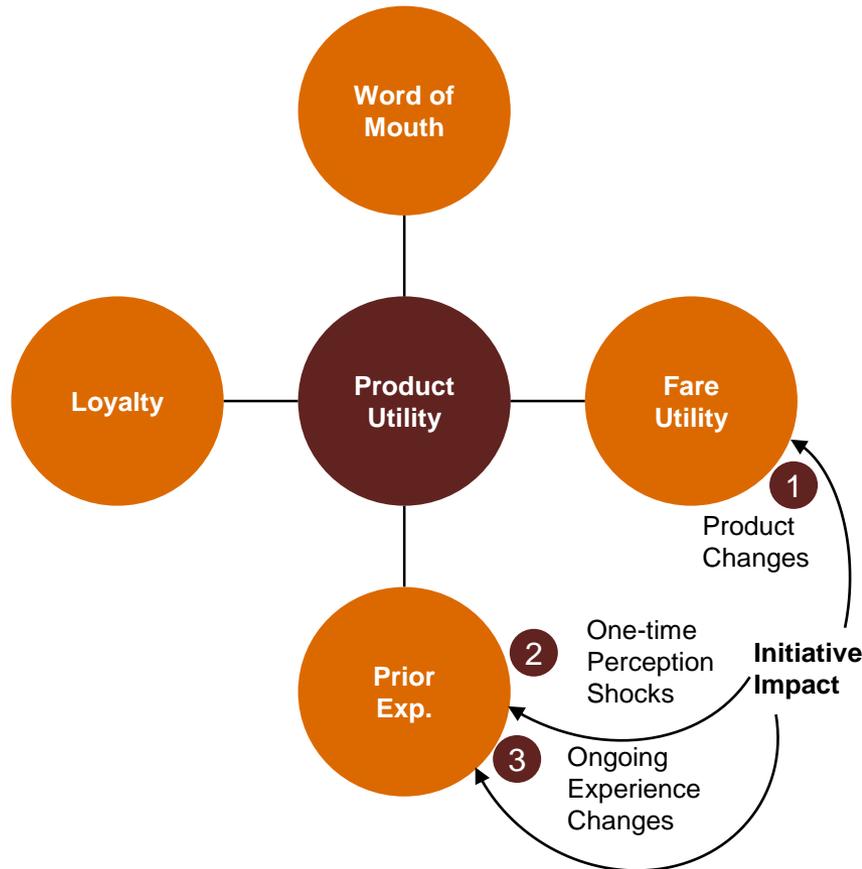
**Indirect Impacts:** Once a product is introduced or a policy change occurs, side effects flow through the model by means of:

- Word of Mouth transmissions
- Customer Loyalty (propensity to repurchase a ticket on an airline)

## Case study: Airlines client

New products or policies directly affect the value proposition of Airline's core product and the experiences it delivers

### Model Interactions



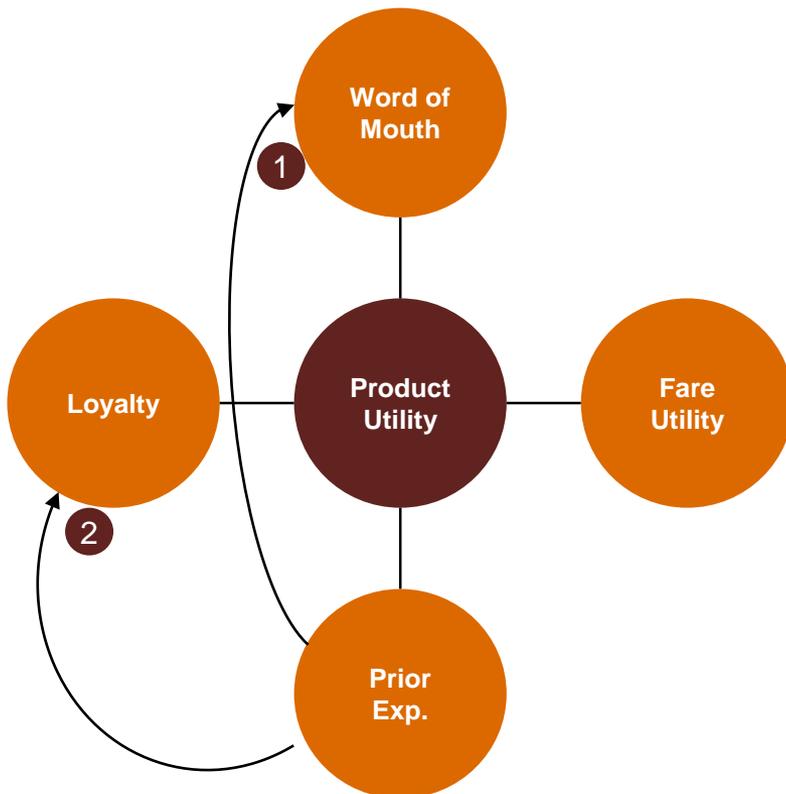
### Direct Initiative Impacts

- 1 Product Changes: Certain initiatives will fundamentally change the value of Airline's core product, by making it more expensive (e.g., change fee), increasing the options available to consumers (e.g., same day standby), or increasing the value of the product (e.g., business class)
- 2 One-Time Perception Shocks: Consumers may become elated or disappointed when they discover new products or policies that contrast with their prior perceptions of the brand, causing a one-time shock to their perception
- 3 Ongoing Experience Changes: New products or policies may affect the flight experiences of traveling consumers, causing an ongoing change in flight satisfaction that persists over time)

## Case study: Airlines client

These products and policies also have indirect side effects on word of mouth and loyalty

### Model Interactions



### Indirect Initiative Impacts

#### 1 Word of Mouth:

- Initiatives that decrease consumer perception of the brand will result in greater numbers of negative word of mouth messages transmitted by the consumer
- This causes a decreased perception relative to competitors
- The opposite is true for increases in the firm's perception

#### 2 Loyalty:

- Decreased consumer perception for Airline will cause consumers to choose our client less often
- As consumers fly Airline less often they become less loyal to the brand, further decreasing their propensity to repurchase
- The opposite is true for increases in consumer perception

# *Appendix*

## High-level model diagram of Airline client

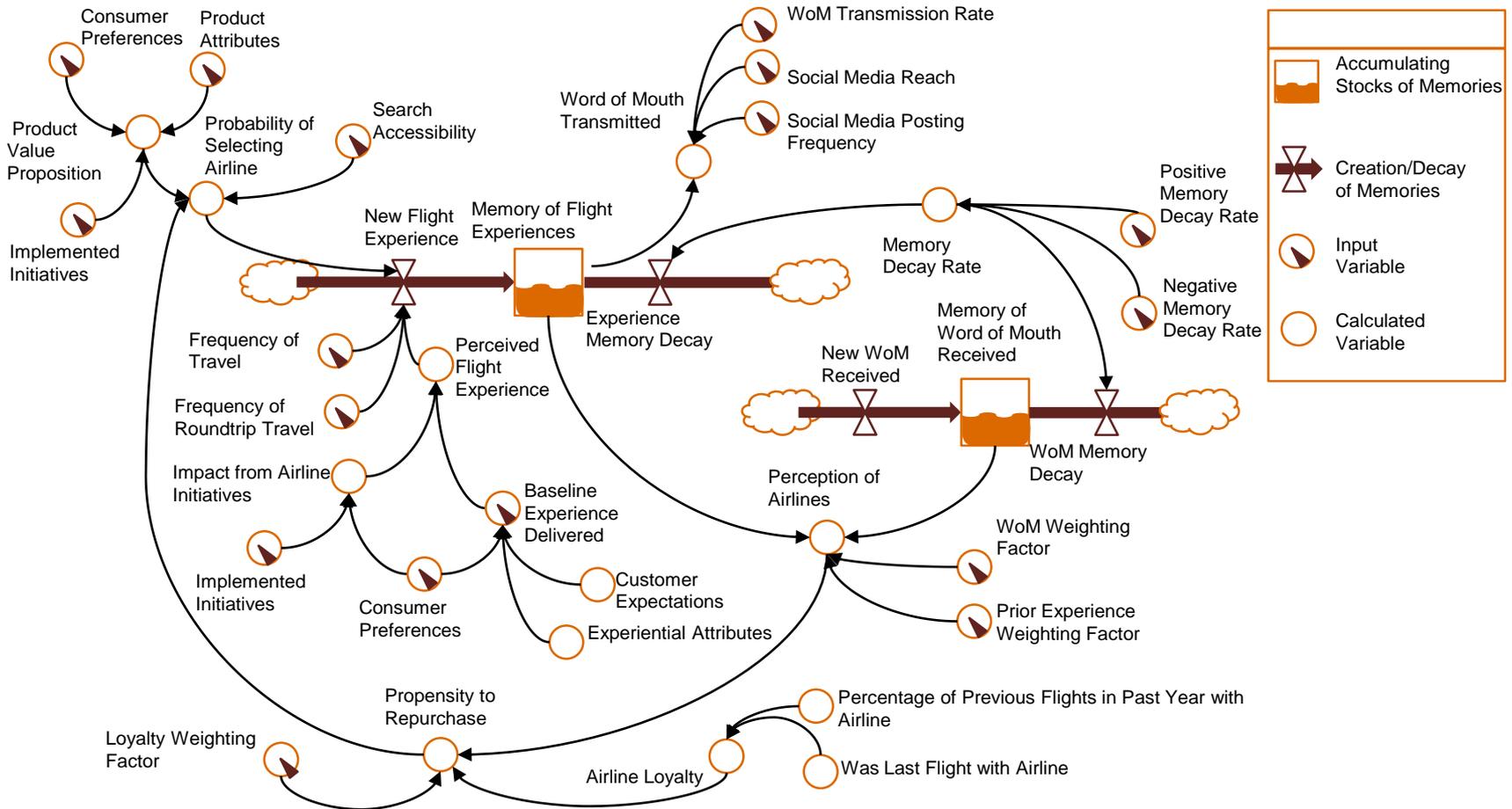
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## ***Data Sources***

- 1. Time series of airline market shares, volume, prices, etc.**
- 2. Cross section of individual travel behavior – frequency of flying**
- 3. Market research – PwC Experience Radar**
- 4. Market research - client discrete choice models**
- 5. Consumer choice literature**
- 6. Qualitative knowledge of airline industry**

# Case study: Airline client

## High-level model overview

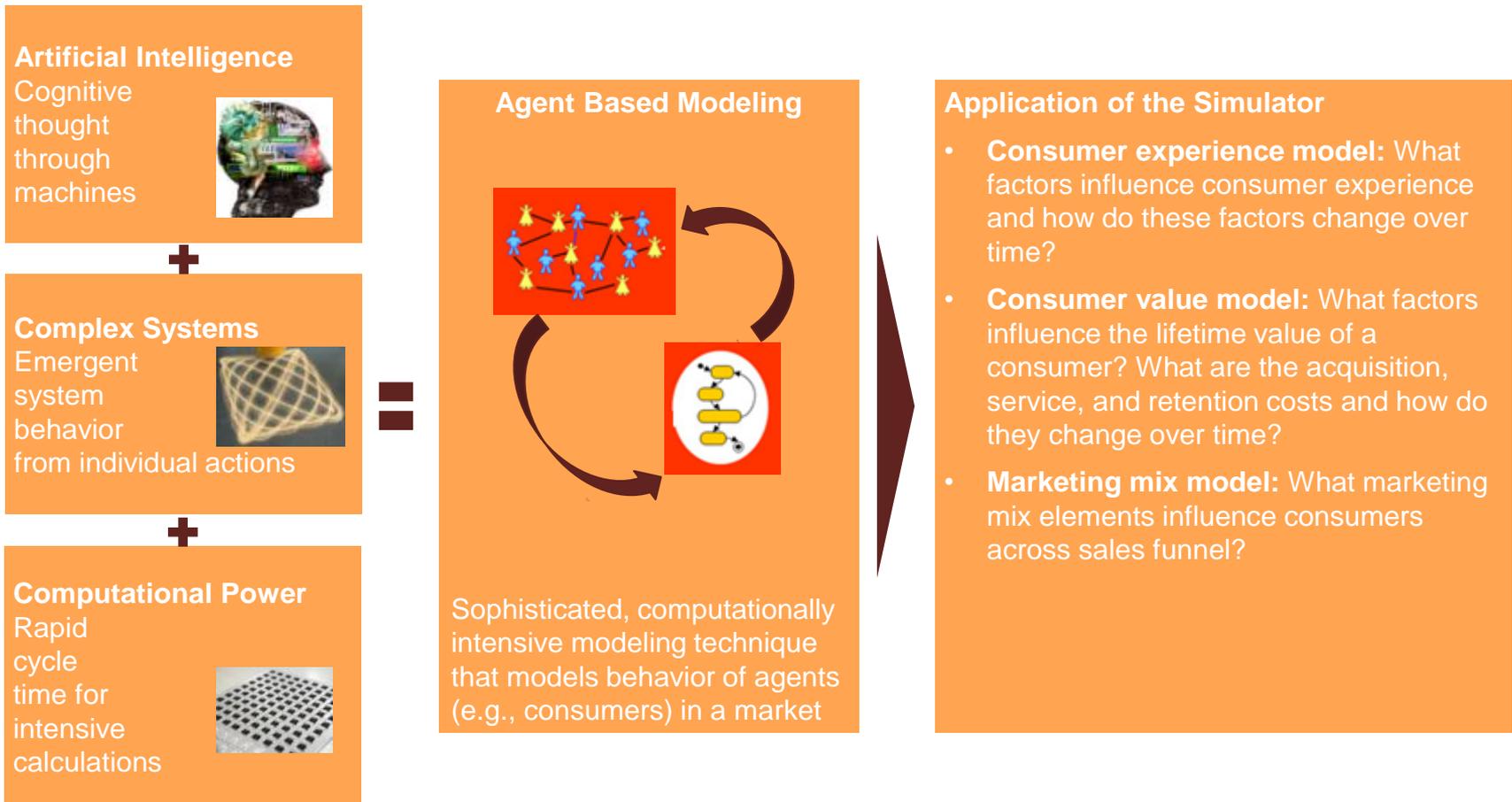


# *Appendix*

## xNavigator walkthrough

## Model overview

Experience Navigator is one instance of a class of models that can be built to model and analyze individual behaviors



## Model overview

Experience Navigator is a test bed that simulates the purchase decision making of individuals and intermediaries and their impact on firms

### Consumer Agents

- 100,000+ “consumers”

#### Actions

- Buying-process
- Evolutionary learning
- Sending WOM\*
- Creating/sharing memories

#### Properties

- CE-attribute preferences
- Bounded rationality

### Consumer Experience

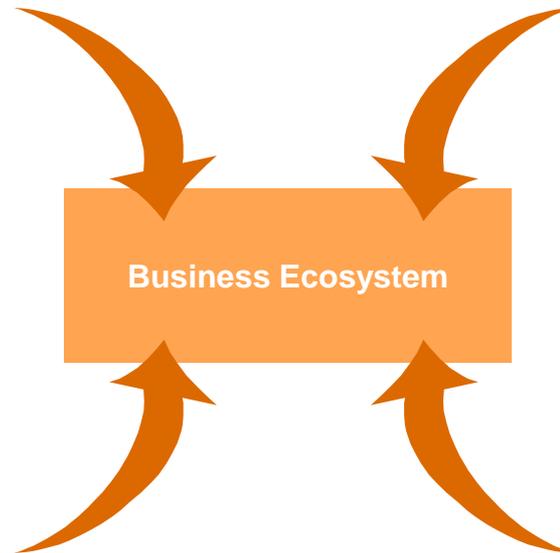
- 9 CE Attributes

#### Purpose

- Distinguish products/services
- Generate memes\*\* of the firm over time

\***WOM:** Word-of-mouth

\*\***Memes:** The postulated unit of cultural ideas, memories, and stories for each firm



### Intermediaries

- 1+ media channel

#### Purpose

- Influence awareness, consideration, and purchase

#### Model Extensions

- Capacity & supply chains
- Media-mix strategy

### Firm Agents

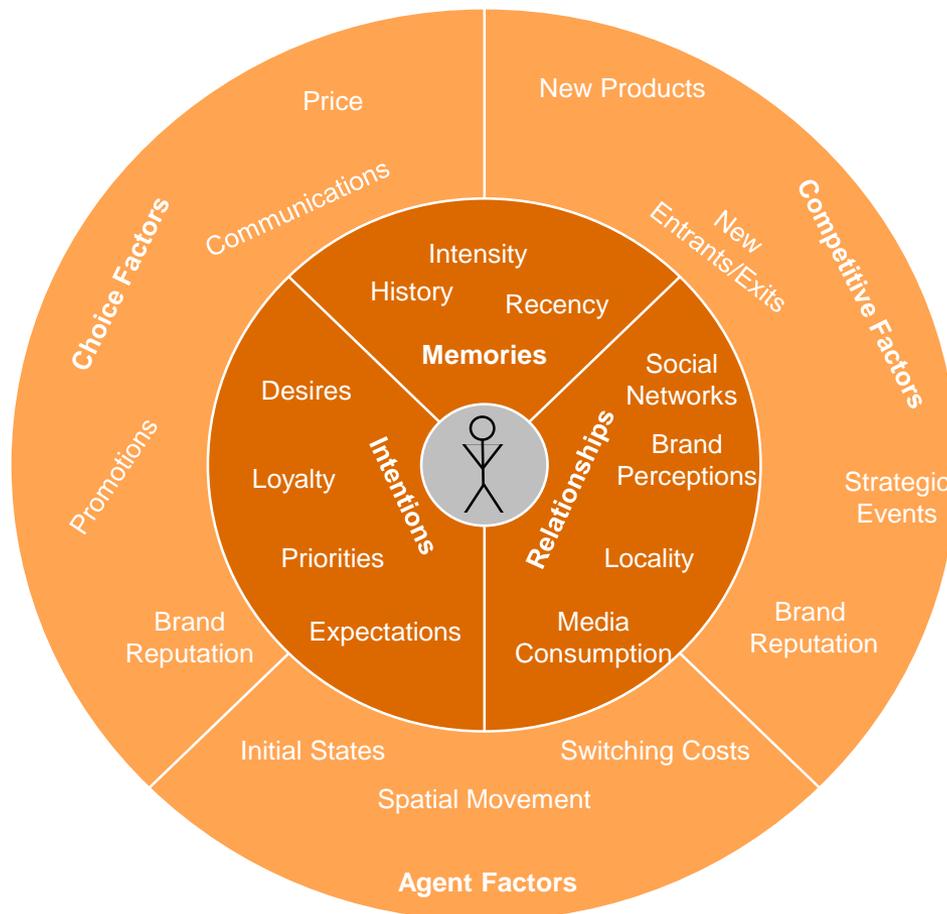
- 7+ replications

#### Actions

- Offer differentiated products/services
- Broadcast marketing messages
- Resolve negative consumer experiences

## Model overview

Experience Navigator models a variety of individual, intermediary, and firm attitudes, behaviors, and decision processes



### Awareness → Function of

- **Presence:** Aware of a firm in the market

### Consideration → Function of

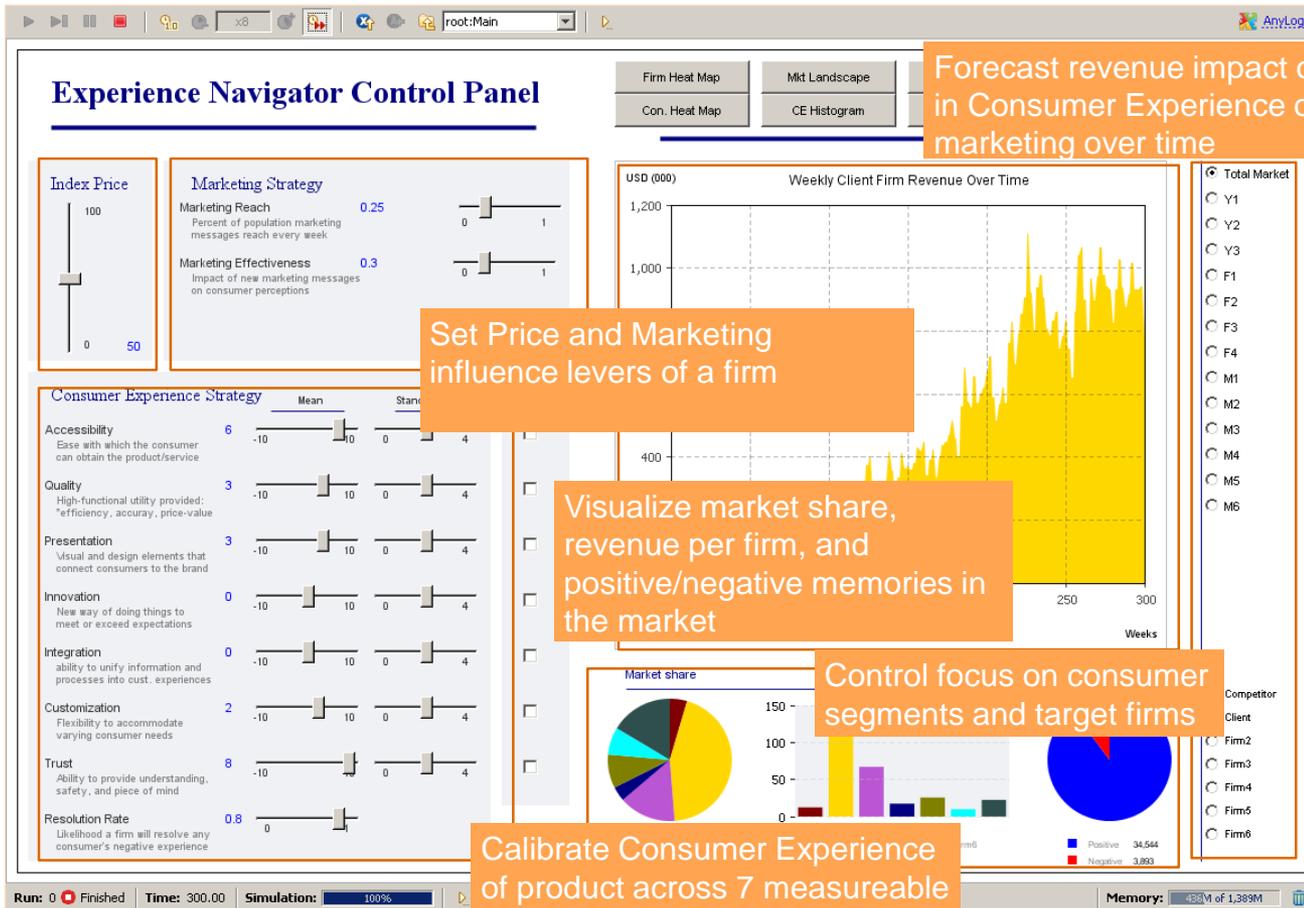
- **Memories:** Positive/Negative memories of past usage
- **Stories:** Messages learned through WOM or marketing
- **Loyalty:** Inertia – acting on what you know

### Choice → Function of

- **Perceived Utility:** Weighted measure of perceived value
- **Price:** Price in the market at time of purchase
- **Memories:** Positive/Negative memories of past usage
- **Stories:** Messages learned through WOM or marketing
- **Loyalty:** Inertia – acting on what you know

# Model overview

## Navigating the experience control panel and seeing the impact on market share and revenues



Forecast revenue impact of change in Consumer Experience or marketing over time

Set Price and Marketing influence levers of a firm

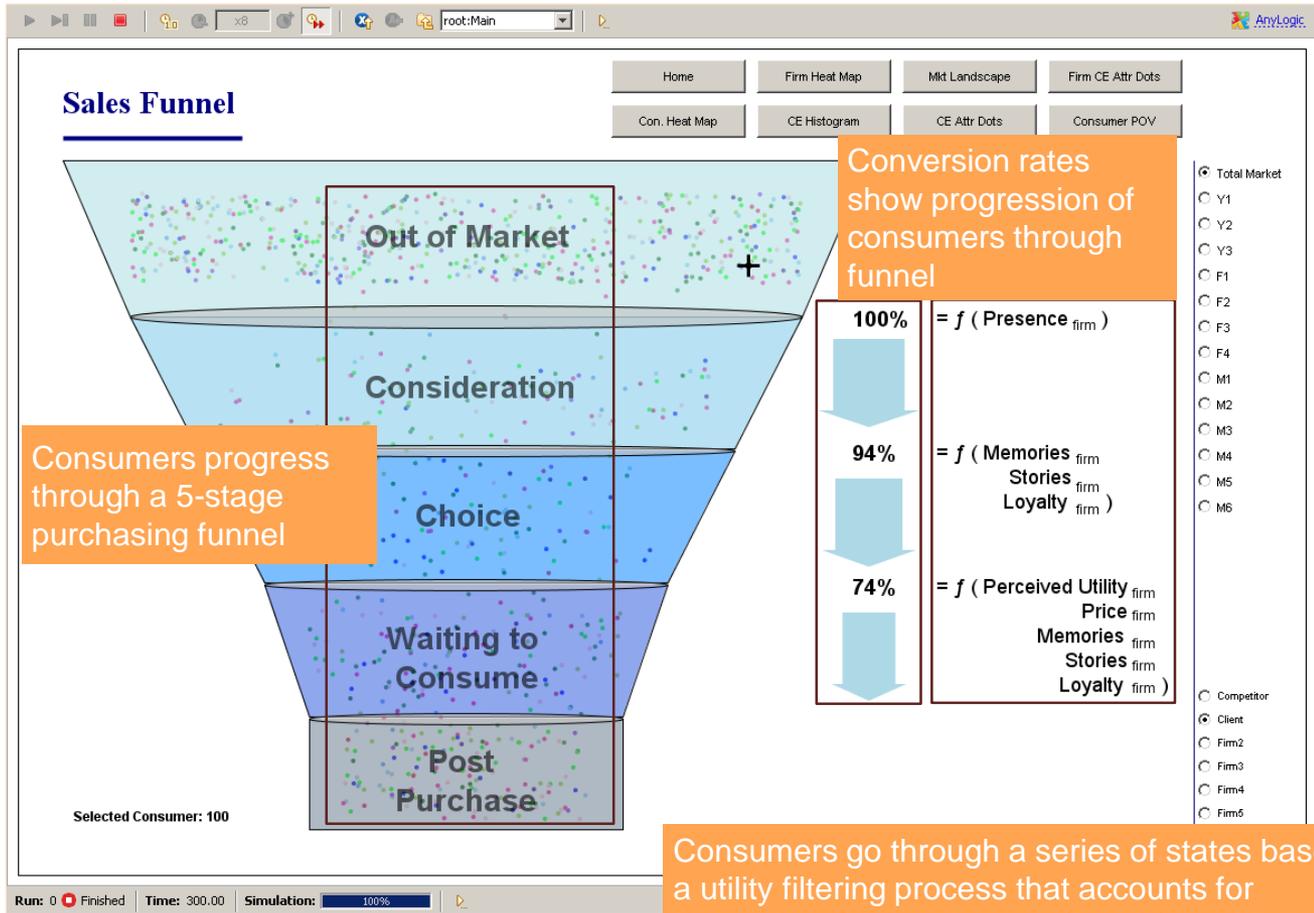
Visualize market share, revenue per firm, and positive/negative memories in the market

Control focus on consumer segments and target firms

Calibrate Consumer Experience of product across 7 measurable attributes

# Model overview

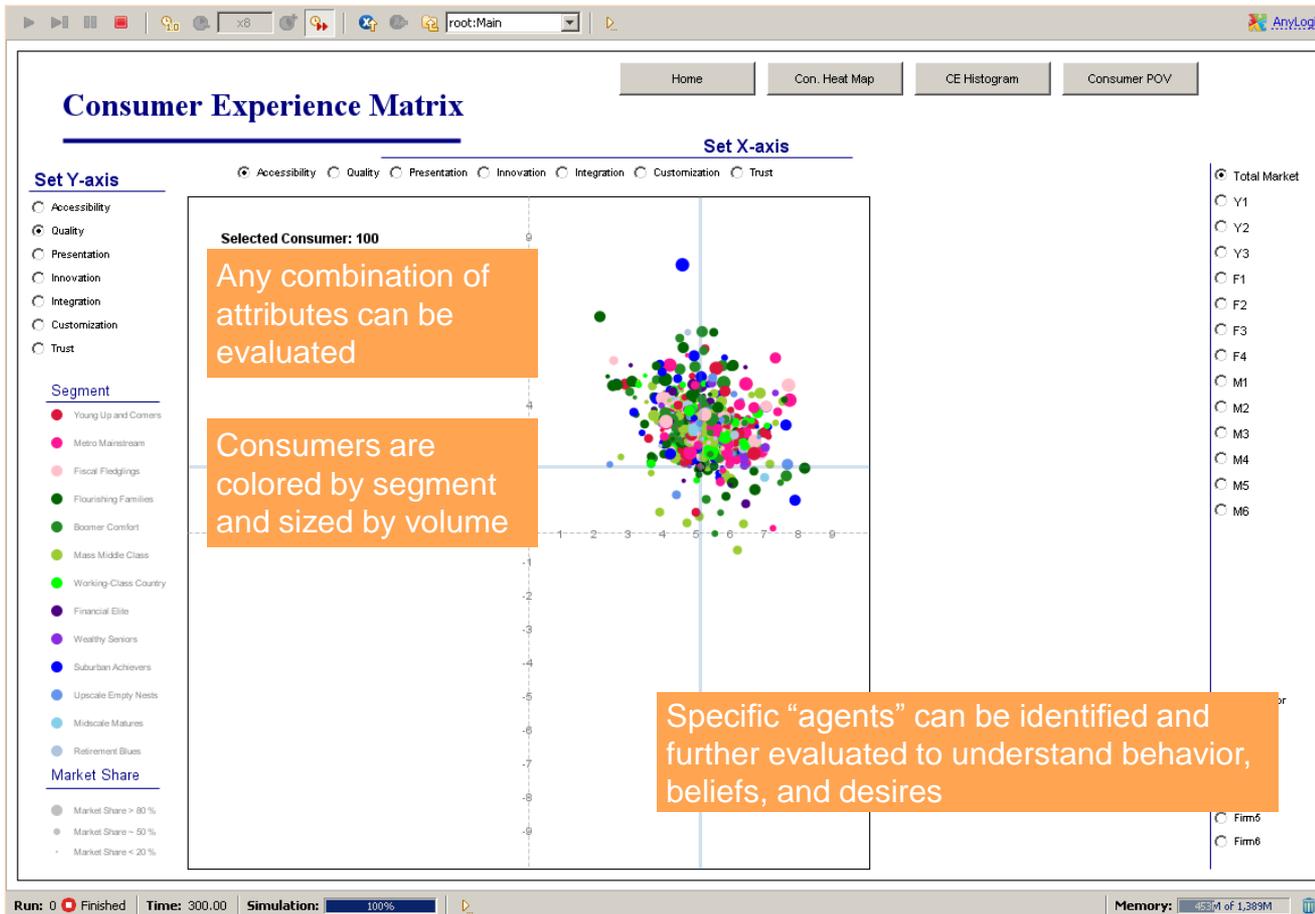
Analyze sales funnel at specific segment and individual competitor level



Consumers go through a series of states based on a utility filtering process that accounts for Memories, Stories, Loyalty (inertia), and Price

# Model overview

## Visualize consumers changing beliefs over time



# Model overview

Dive into individual agents to understand their positive and negative experiences

