Driving toward the future of transportation

A global auto manufacturer undertook an innovative Artificial Intelligence-based approach to find a profitable road forward in the personal mobility marketplace.

**Executive summary**

**Client challenge:**
Evaluating and entering new potential markets using data-driven decision making:
- Uncertainty about the future of new disruptive markets (e.g., ride sharing, autonomous cars, electric vehicles).
- Lack of sufficient data to make informed predictions.
- Inability to analyze multiple business scenarios built on many variables.

**PwC’s solution:**
Use agent-based modeling and artificial intelligence techniques to analyze data, evaluate scenarios and find winning strategies:
- Conduct a five-step evaluation of the market and all its key variables.
- Collect and process data from a wide variety of structured and unstructured data sources.
- Draw conclusions based on advanced models that run hundreds of thousands of “what-if” simulations.

**Impact on client’s business:**
- The company was able to select the most appropriate strategies and locations for market entry.
- It used analytic insights from the agent-based model to inform its long-term go-to-market and investment strategy.
- Rather than face the challenges of industry disruption, it has been able to disrupt itself proactively to prepare for the future.

• Navigating risk and regulatory complexity
• Accelerating digital and technology impact
• Stimulating innovation
**Client’s challenge:**
Evaluate and enter potential new markets using data-driven decision making

How will we get from place to place five, ten, or 20 years from now? What does the future hold for cars? While it’s easy to fantasize or take amusing guesses, questions like these are dead serious business for auto companies that will need to spend several years and billions of dollars to retool for whatever the market eventually demands. They need answers based on intelligence, not dreamy speculation.

One large auto company was especially interested in how car and/or ride sharing might impact its business in the years ahead and how it could participate in the growing trend, rather than simply cede it to upstart innovators. It needed assistance not only with defining the economic drivers and mechanisms that were enabling the trend, but also with developing sensible business models that could take advantage of the new opportunity as well as factors promoting or inhibiting customer adoption, and pick the right markets for launches.

**PwC’s solution:** Use agent-based modeling and artificial intelligence techniques to analyze data, evaluate scenarios, and find winning strategies

Company leaders charged with the research knew they had only limited information to work with. To evaluate the viability of personal mobility, develop go-to-market strategies, and prioritize key cities, they would need a much deeper data pool and a smart analytic framework that would unlock all the data possibilities to yield actionable conclusions.

Having worked with PwC on similar strategic issues in the past, the Client approached us to develop a conceptual model of the ride sharing economy. PwC was able to assemble a team of professionals in advanced agent-based modeling techniques and auto industry dynamics to quickly develop a feasibility model. This was further refined to evaluate a number of strategic go-to-market scenarios as well as operational details required to develop a profitable business.

We executed a five-phase approach to evaluate personal mobility as a potential new business opportunity:

1. **Assessing the viability of select car sharing business models:**
   We began by developing a model to simulate the financial, operational, and adoption dynamics of a car-sharing market given a specific entry strategy. Using systems dynamics, agent-based models and available internal and external data on the sharing market, we identified key components, limitations, and dependencies of each possible strategy.

2. **To capture the complexities in choice, we built an agent-based model, where consumers make decisions based on their own characteristics and experience. Each component of that model contained processes and feedback loops that impacted the interdependencies present in a changing system. The steps of framing the context, developing the fact base, constructing the model, and exploring its dynamics are all important, but just as important was the team’s ability to find and use data from a number of different sources—and sometimes quite unusual—array of sources and then put it to work successfully within the models.**

3. **Evaluating the shifting profit pools in transportation:**
   The next step was to conduct an analysis of almost 30 segments across the value chain, screening for the most compelling potential growth opportunities. This work included determining and confirming the size and profitability of markets using the financials of major players; identifying change drivers for each segment;
brainstorming and discussing 130 customer dissatisfactions, market inefficiencies, and segment frictions; and conducting interviews with industry experts. Through this process we identified four key opportunities, with the greatest growth potential, for further investigation.

4. Selecting target markets for entry: Next up was geography and the use of a demographic model to identify and prioritize markets with specific characteristics. We modified PwC’s Demand Estimator Analytic App to carry out this prioritization. Using open APIs and Web scrapers, we collected regional demand and supply data for existing sharing economy services and compared usage patterns to a market’s population and transportation characteristics. Our Demand Estimator analytic app used the power of data mash-ups, advanced analytics, and smart visualization to help drive fact-based decisions.

5. Developing a strategy formulation for entry into target markets: Finally, we conducted a detailed assessment of supply and demand requirements under specific adoption scenarios for the selected high-priority target markets. In this analysis, we ran more than 200,000 go-to-market simulations to focus on 6,000 of the key simulations that satisfied the criteria specified by the executives. These simulations were able to define the financial and operational implications of mobilization strategies and identify which decisions would have the greatest influence on the business’s objectives.

This unique agent-based modeling approach, based on artificial intelligence (AI) techniques, allowed us to capture the choice and adoption characteristics critical for personal mobility. The unique approach of blending human intuition from the Client executives and the machine intelligence from the agent-based models allowed us to go broad-and deep in the decision-making process within a short time frame that would have been impossible with either one of them. This exercise illustrated clearly to the Client how AI can augment our decision making and lead to augmented intelligence.

**Impact on client’s business: New businesses and new revenues**

For the auto company, this engagement became a story of disruption driven by data. Armed with the fact-based conclusions we helped develop over the course of a year and that were endorsed by the CEO, company leaders moved quickly, establishing new personal mobility services in several targeted markets.

Going forward, the new businesses will expose drivers to the company’s models to cultivate future buyers, while it makes money in ways it wouldn’t have imagined just a few years ago. The company’s data-driven decisions are now helping it disrupt itself, discover new revenue streams, and avoid any potholes that the future of personal mobility may present.

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