

MGMT 68300: Tech Driven Business

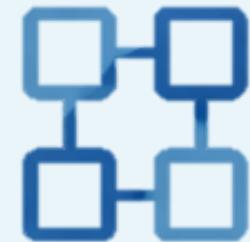
Leveraging Failed Tech Products and Digital Transformation

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Executive Summary

Part 1: Analyzing Failed Tech Product



Framework: Four dimensions – Customer Connection, Data Assets, Technology Know-How



Google Glass's Enterprise Success: Pivot to enterprise + foundational role in AR technology → largest competitive advantage



Apple Newton's Lasting Impact: ARM investment + pioneering mobile computing → groundwork for future innovations (iPhone, iPad)

Part 2: Ford's New Business Model & Competitive Advantage



Traditional Business Model: Ford's model focused on mass manufacturing and distribution, with profits from vehicle sales and services.



New Business Model (Digital Transformation): Ford integrates connected vehicles and data services, emphasizing subscription revenue and platform engagement.



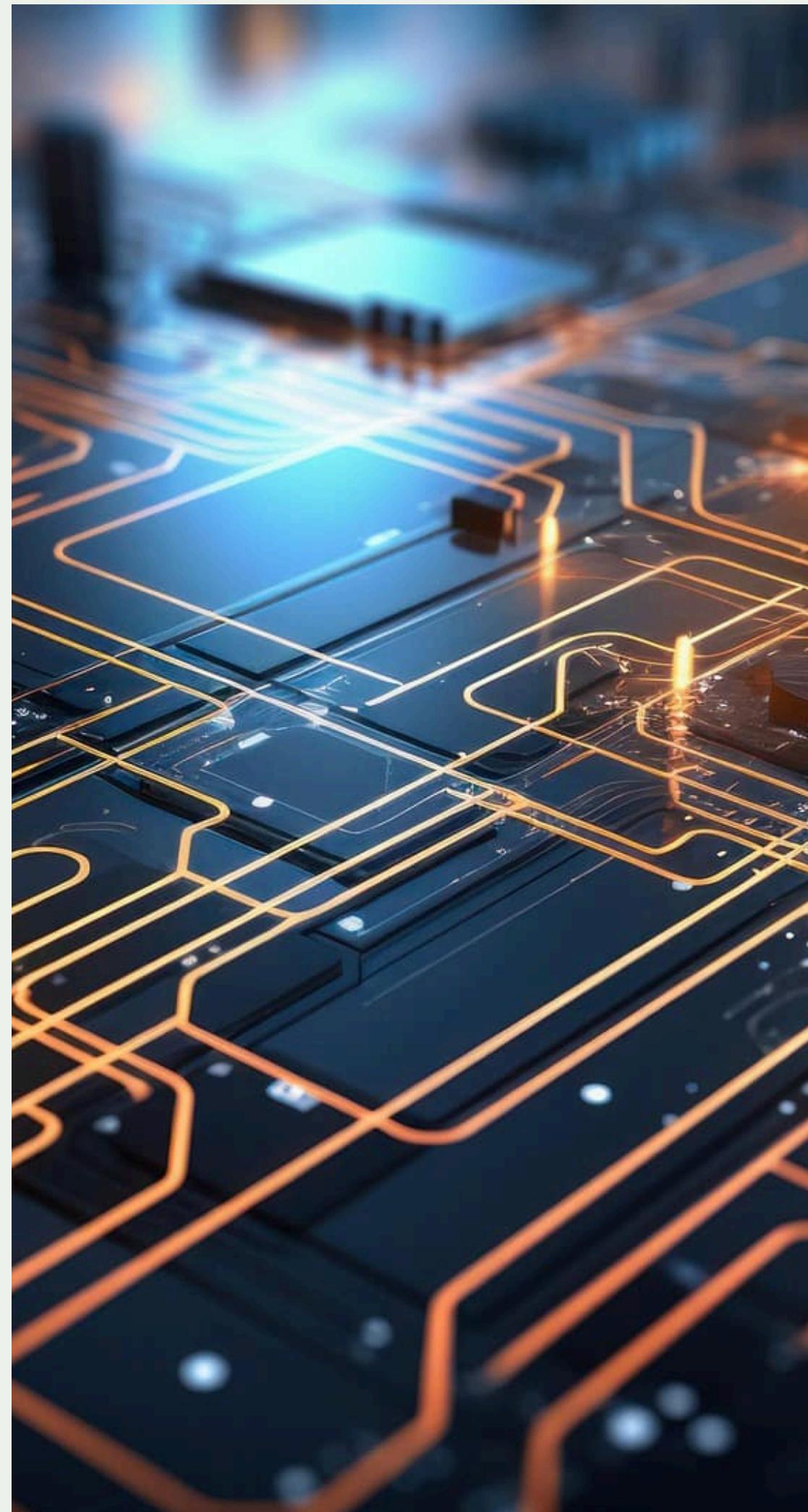
Digital Technologies' Role in Modernizing User Experiences: Tech enhances experiences with connected services, diagnostics, and over-the-air updates.



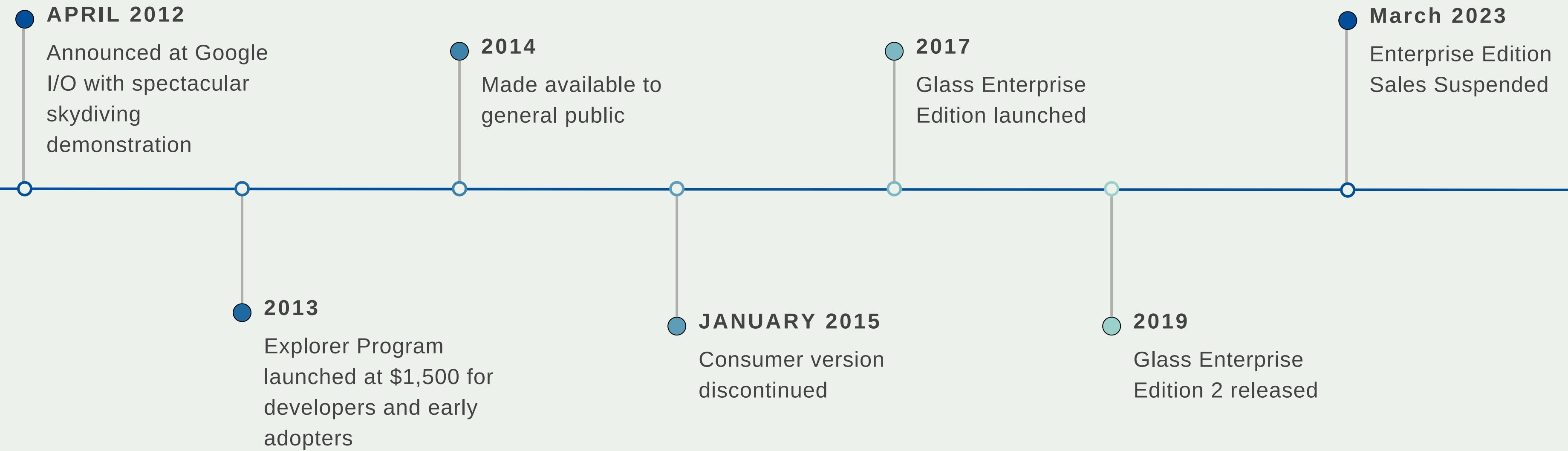
Business Function & Process Transformation: Ford uses Industry 4.0 tools like IoT and predictive analytics to optimize manufacturing, supply chains, and financial services.

Background

- 1 EVEN INDUSTRY LEADERS FACE PRODUCT FAILURES IN RAPIDLY EVOLVING TECHNOLOGY MARKETS.**
- 2 SUCH FAILURES CAN PROVIDE CRITICAL LEARNING OPPORTUNITIES FOR FUTURE INNOVATION.**
- 3 GOOGLE GLASS WAS UNSUCCESSFUL INITIALLY BUT LATER REPOSITIONED TO CREATE STRATEGIC VALUE.**
- 4 APPLE NEWTON FAILED COMMERCIALLY YET LAID THE FOUNDATION FOR MODERN MOBILE DEVICES.**
- 5 BOTH EXAMPLES HIGHLIGHT HOW COMPANIES CAN TURN SETBACKS INTO LONG-TERM COMPETITIVE ADVANTAGES.**



Google Glass: Product Overview and Timeline



Why Google Glass Failed in the Consumer Market

Privacy Concerns and Social Stigma:

Google Glass's always-on camera sparked major privacy concerns, making people uncomfortable, leading to social backlash, the term "Glasshole," public confrontations, and bans in many establishments.

High Price Point:

At \$1,500, Google Glass was priced beyond mainstream adoption, limiting it to early adopters and tech enthusiasts.

Lack of Clear Use Cases:

Google Glass lacked a clear consumer value proposition, as its features overlapped with smartphones, which were already more practical and socially accepted.

Technical Limitations:

- Hardware Limitations
- Poor User Experience



The Enterprise Pivot: A Strategic Transformation

After its consumer failure, Google repositioned Glass as a business-focused tool. In 2017, it launched Glass Enterprise Edition, targeting industries where hands-free computing delivered clear value.

Healthcare: Doctors reduced administrative work and increased patient interaction; hospitals reported major time savings on electronic health records.

Manufacturing: Firms like Boeing and Volkswagen used Glass for hands-free assembly and maintenance, improving efficiency and accuracy.

Logistics: DHL adopted Glass for warehouse picking, boosting order speed and reducing errors.



Competitive Advantage Analysis: Google Glass

CUSTOMER CONNECTION/RELATIONSHIP

SCORE: 10/10

CONSUMER LAUNCH FAILED → ENTERPRISE PIVOT SUCCEEDED

- FORTUNE 500 PARTNERSHIPS
- LONG-TERM HEALTHCARE CONTRACTS
- STRONG DEVELOPER ECOSYSTEM
 - ESTABLISHED GOOGLE AS AN ENTERPRISE AR LEADER

DATA ASSETS

SCORE: 10/10

GOOGLE GLASS CREATED HIGH-VALUE DATA ASSETS

- FIRST-PERSON VIDEO, IMAGES, VOICE, AND GESTURE DATA → CV & NLP
- TRAINING
 - CONTEXT-AWARE INTERACTION DATA
 - HEALTHCARE WORKFLOW AND CLINICAL DOCUMENTATION INSIGHTS
 - MANUFACTURING & LOGISTICS EFFICIENCY METRICS
 - ACCELERATED GOOGLE'S AR/XR AND COMPUTER VISION CAPABILITIES

TECHNOLOGY KNOW-HOW

SCORE: 9/10

HARDWARE INNOVATION: MINIATURIZED OPTICS (LCOS), POWER EFFICIENCY, AND THERMAL MANAGEMENT FOR WEARABLES

SOFTWARE & AI: REAL-TIME COMPUTER VISION, OBJECT AND VOICE RECOGNITION, LOW-LATENCY AR RENDERING

ANDROID XR FOUNDATION: GLASS LEARNINGS SHAPED ANDROID XR (2024), ENABLING MULTIPLE USE-CASE ENTRY POINTS

PROOF OF CONCEPT

SCORE: 10/10

- PROVEN WEARABLE AR FEASIBILITY WITH ALL-DAY BATTERY LIFE AND HANDS-FREE INTERACTION
- ENTERPRISE VALIDATION: 60–70% ADMIN TIME REDUCTION (HEALTHCARE), 25–30% FASTER MANUFACTURING TASKS, 15–25% LOGISTICS EFFICIENCY GAINS
 - ECOSYSTEM SUCCESS: COMPANIES LIKE AUGMEDIX BUILT SCALABLE BUSINESSES, PROVING ENTERPRISE AR VIABILITY

Apple Newton



- Launched by Apple in 1993 as a personal digital assistant (PDA).
- Developed under John Sculley's leadership.
- Apple's ambitious attempt at a new mobile computing category.
- Faced technical limitations and challenges.
- Laid groundwork for future devices like the iPhone and iPad.



Why Newton Failed

Handwriting Recognition Problems:

Newton's handwriting recognition was inaccurate at launch, became a public joke, and permanently damaged its reputation despite later improvements.

Excessive Price:

The MessagePad launched at \$699 (approximately \$1,500 in 2024 dollars), severely limiting its market.

Premature Technology:

As Newton's UI designer admitted: "We were just way ahead of the technology." The device was bulky, heavy, with limited battery life and poor display quality.

Competition from Palm Pilot:

Palm Pilot succeeded by using simple handwriting input, a smaller design, and a much lower price, which better matched user needs.

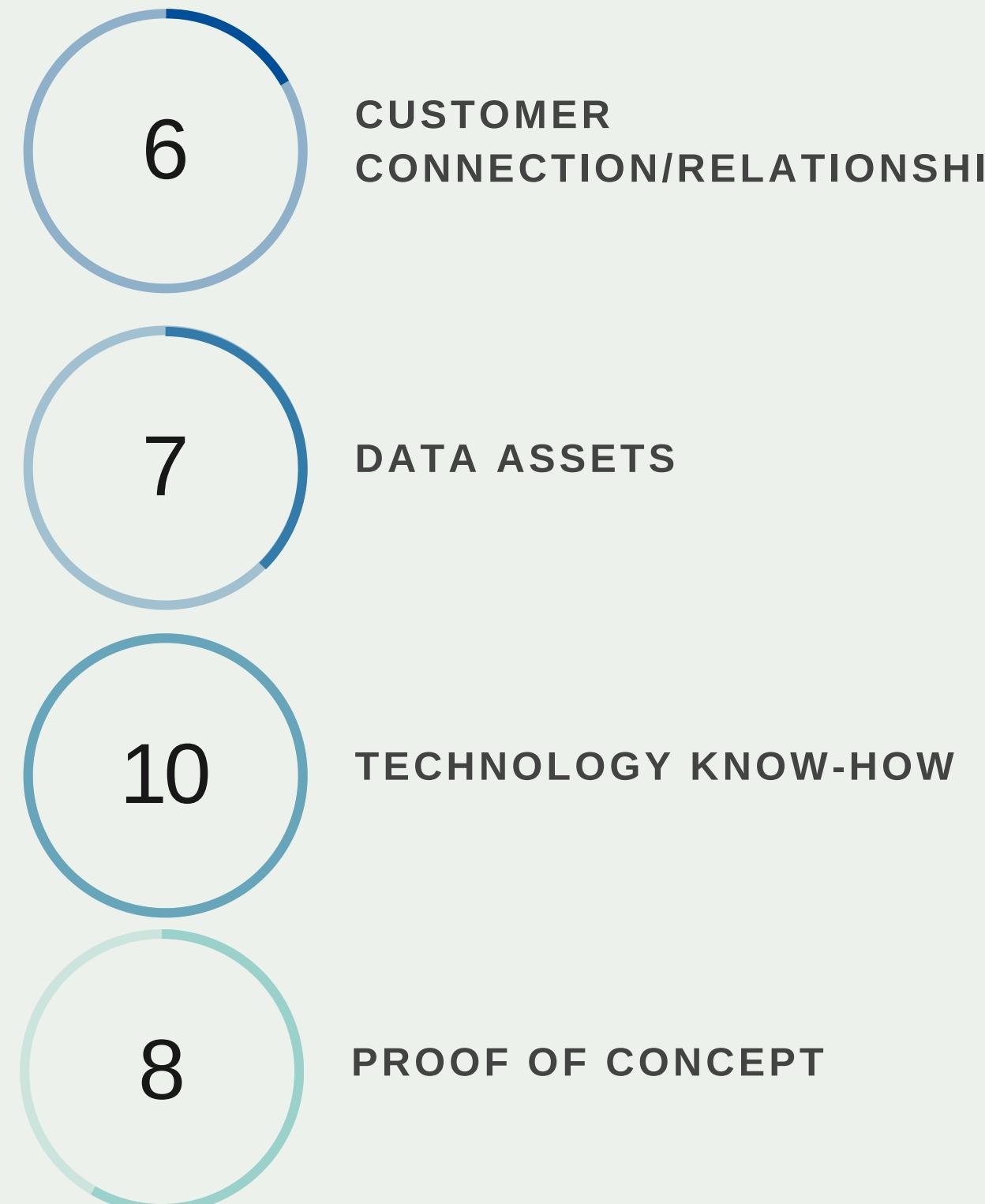
Corporate Turmoil:

When Steve Jobs returned to Apple in 1997, the company was struggling financially. He discontinued the Newton to focus on profitable products, citing massive, unquantifiable losses.



Competitive Advantage Analysis: Apple Newton

Scores out of 10



- ***Customer Connection/Relationship:*** Newton built a loyal user base and achieved niche adoption in healthcare, education, real estate, and sales.
- ***Data Assets:*** Handwriting and natural language data improved Newton's OS and informed later Apple technologies like Inkwell and Siri.
- ***Technology Know-How:*** Newton's ARM investment, touchscreen design, and mobile OS innovations paved the way for iPhone, iPad, and Apple Silicon.
- ***Proof of Concept:*** Newton created the PDA market and provided strategic lessons that shaped iPhone design and the mobile ecosystem.

Comparative Analysis

Dimension	Google Glass	Apple Newton
Timing and Market Readiness	Launched in 2012 when cloud computing, mobile networks, and AI were mature enough to support its vision	Launched in 1993, 7-10 years before technology could support its ambitions
Revenue Generation	Glass Enterprise Edition generated actual revenue from enterprise customers	Never achieved profitability despite six years in market
Data Collection Scale	Operated in the AI era with cloud computing and machine learning infrastructure, generating training data for learning computer vision and AI	Operated before big data and machine learning
Ecosystem Integration	Integrated with Google's existing ecosystem (Search, Assistant, Translate), creating value across multiple products	Operated as standalone platform with limited Mac integration

Conclusion: Google Glass as Superior Competitive Advantage

LESSONS FOR AI-DRIVEN COMPANIES

- Proof-of-concept value: First movers gain long-term leadership - Glass validated AR wearables for Google's XR leadership, while Newton enabled Apple's later mobile dominance
- Ecosystem leverage: Strong ecosystems amplify value from failed products by reusing technologies and insights across platforms.
- Market pivot capability: Failure in consumer markets can still lead to enterprise success; evaluate alternate applications before discontinuation
- Data as a strategic asset: Even failed products generate long-term value—Glass's first-person data continues to strengthen Google's AI and AR capabilities
- Technology transfer: Capabilities from failed products can succeed elsewhere; retain IP and actively pursue transfer opportunities
- Vertical market focus: Glass succeeded by targeting niches where hands-free computing delivered clear ROI, showing mass-market failure can mask specialized success

FINAL DETERMINATION

Google Glass outperformed Newton (38/40 vs. 31/40) by achieving stronger competitive advantage through:

- Monetized enterprise pivot
- Unmatched data assets
- Direct influence on Android XR strategy
- Clear, measurable ROI across industries

CONCLUSION

While Apple Newton's ARM investment created enormous long-term value, Google Glass delivered greater immediate competitive advantage in transforming failure into success. Glass's enterprise pivot, rich data assets, quantified ROI, and direct influence on Google's XR strategy make it the stronger example of extracting value from a failed technology product.

Lessons for AI-Driven Companies

- **MARKET PIVOT CAPABILITY**

Glass showed that failure in one market (consumer) doesn't preclude success in another (enterprise). Companies should evaluate multiple market applications before discontinuing failed products.

- **DATA AS STRATEGIC ASSET**

Even failed products generate valuable data. Glass's first-person data continues providing advantages years after consumer failure. AI companies should maximize data collection from all products.

- **TECHNOLOGY TRANSFER**

Both Glass and Newton show technology from failed products often finds applications elsewhere. Companies should maintain IP from failures and actively seek transfer opportunities.

- **VERTICAL MARKET FOCUS**

Glass succeeded by focusing on specific use cases where hands-free computing provided clear value. Products failing in mass markets may succeed in specialized applications.

- **PROOF OF CONCEPT VALUE**

Being first establishes leadership even if initial product fails. Glass proved AR wearables viable, enabling Google to lead emerging XR market. Newton created PDA category, allowing Apple to dominate mobile computing.

- **ECOSYSTEM LEVERAGE**

Glass benefited from Google ecosystem integration. Companies with strong ecosystems extract more value from failed products by reusing technologies across platforms.

Introduction - Ford

- 1 FORD'S TRADITIONAL MODEL FOCUSED ON MASS-PRODUCED VEHICLES, DEALER NETWORKS, AND OPERATIONAL EFFICIENCY**

- 2 MAIN CUSTOMERS: CONSUMERS, COMMERCIAL FLEETS, AND GOVERNMENT BUYERS; REVENUE FROM SALES, FINANCING, AND BASIC AFTER-SALES.**

- 3 DIGITAL TRANSFORMATION INTEGRATES SOFTWARE, CONNECTIVITY, AND SERVICES (FORDPASS, FORD PRO) WITH VEHICLES.**

- 4 CONNECTED VEHICLES GENERATE REAL-TIME DATA TO IMPROVE USER EXPERIENCE, FLEET MANAGEMENT, AND PRODUCT DESIGN.**

- 5 NEW MODEL COMBINES MANUFACTURING SCALE WITH PLATFORM, DATA-DRIVEN SERVICES, AND CONTINUOUS CUSTOMER ENGAGEMENT.**





Ford's Traditional Value-Creation Model

- **Ford's traditional value-creation model:**
 - Focused on designing, manufacturing, and selling vehicles at scale.
 - Utilized a large dealer network.
- **Main "job to be done":**
 - Providing reliable mobility and transportation.
 - Served everyday consumers, commercial/fleet customers, and government/institutional buyers.

Ford's Traditional Business Model



LOGIC

Goal: profitably sell high vehicle volumes
How: scale manufacturing + wide dealer network
Why: strong brand and broad product line

VALUE CREATION MODEL

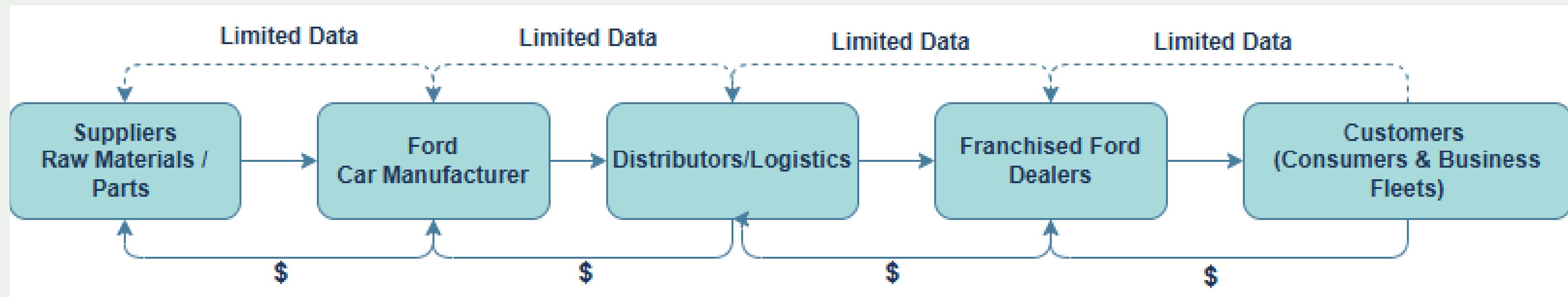
Customers: mass-market consumers & business fleets
Offering: broad range of cars, trucks, vans
Differentiation: reliability + competitive prices + iconic models
Value chain role: design & final assembly
Go-to-market: franchised Ford dealers (sales, trade-ins, service)

PROFIT MODEL

Revenue: vehicle sales + financing/leasing + parts/service
Cost structure: high fixed (plants, R&D) + materials/logistics
Unit economics: margin depends on volume & model mix
Key drivers: high volume, factory utilization, financing penetration

Differentiated value: mainly **operational excellence** (efficient mass production) and some **product innovation** in key models.
Customer intimacy: limited and dealer-centric; **personalization was minimal.**

Traditional Automotive Value Chain



Products flow left → right: Suppliers → Ford → Logistics → Dealers → Customers

Money flows right → left: payments from customers back through dealers and Ford to suppliers

Data/information flows are **limited** and **slow**, mostly from dealers back to Ford

Customer relationship is **episodic** (big purchase + occasional service), so **switching costs** are **low**

Ford's New Business Model



LOGIC

Goal: maximize lifetime value per customer/vehicle
How: manufacturing plus connected software & data platform
Why: data-driven improvements and stronger switching costs

VALUE CREATION MODEL

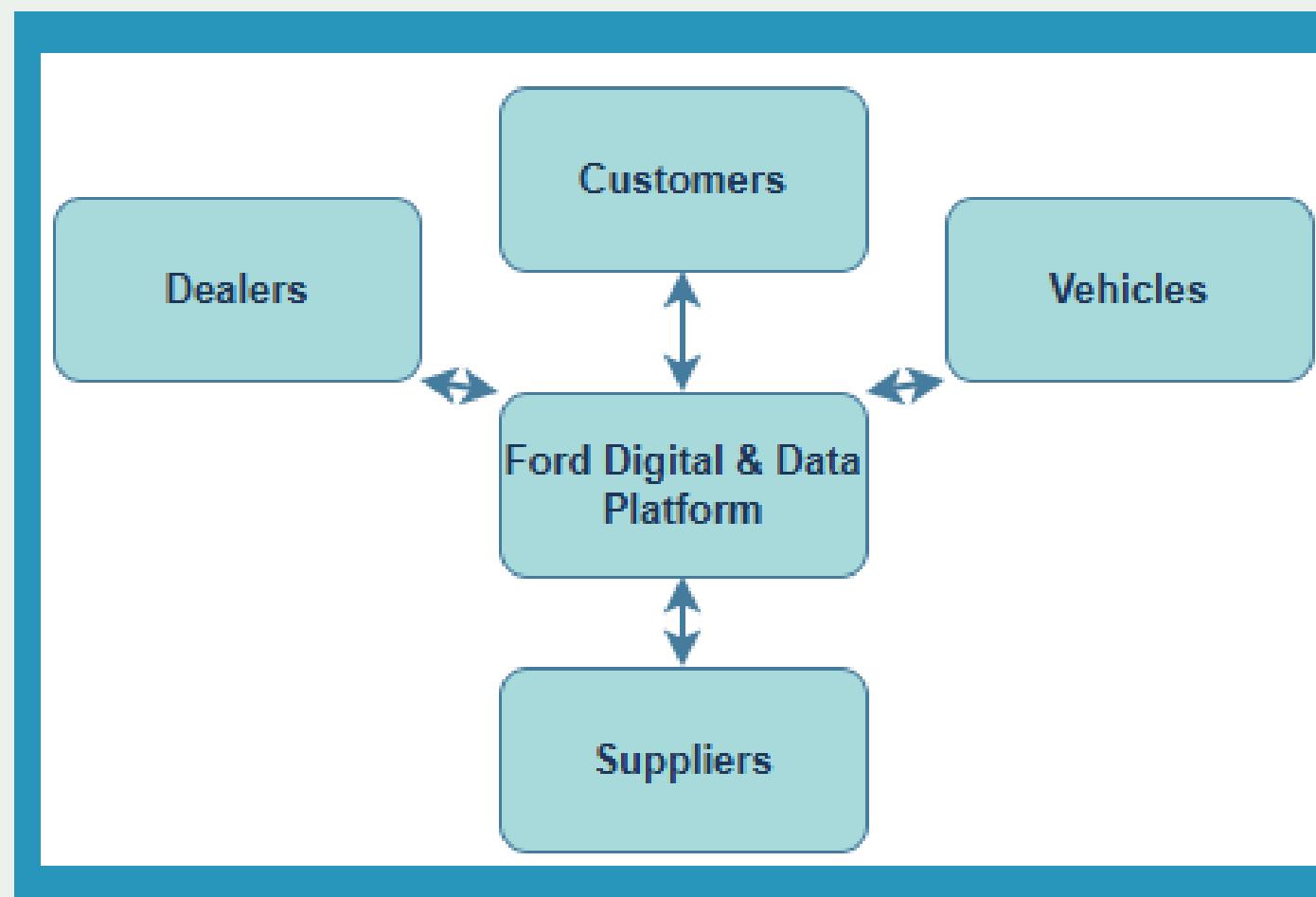
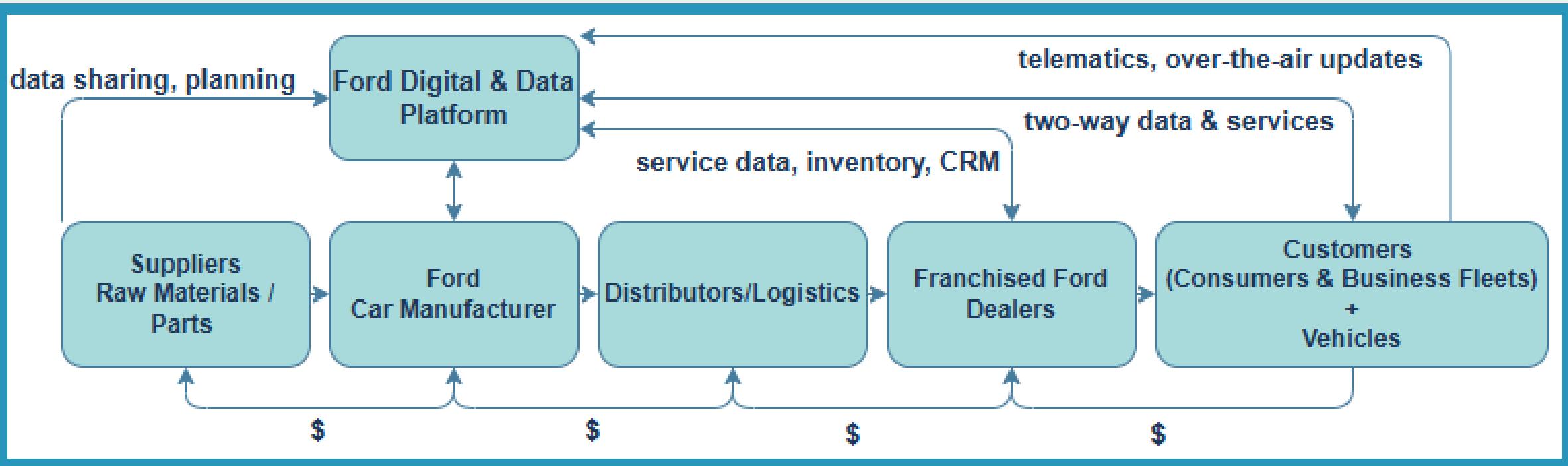
Customers: connected consumers and fleet/business clients
Offering: vehicles + connectivity + software + services
Differentiation: convenience, insights, and efficiency from data
Role: OEM and data/analytics hub across vehicles & dealers
Go-to-market: dealers and direct digital channels (apps, online, fleet sales)

PROFIT MODEL

Revenue: vehicle sales + subscriptions/connected services + more service capture
Costs: manufacturing + software, cloud, and data platform spend
Unit economics: one-time margin + recurring revenue per connected vehicle/fleet
Key drivers: connected penetration, subscriptions, retention, data-driven cost savings

Differentiated value: more **product innovation**, **customer intimacy**, and **value chain coordination** enabled by data and software.
Switching costs: higher – apps, stored data, and fleet integrations make it harder for customers to leave Ford's ecosystem.

Digital Ford: Data Hub and New Virtuous Cycle



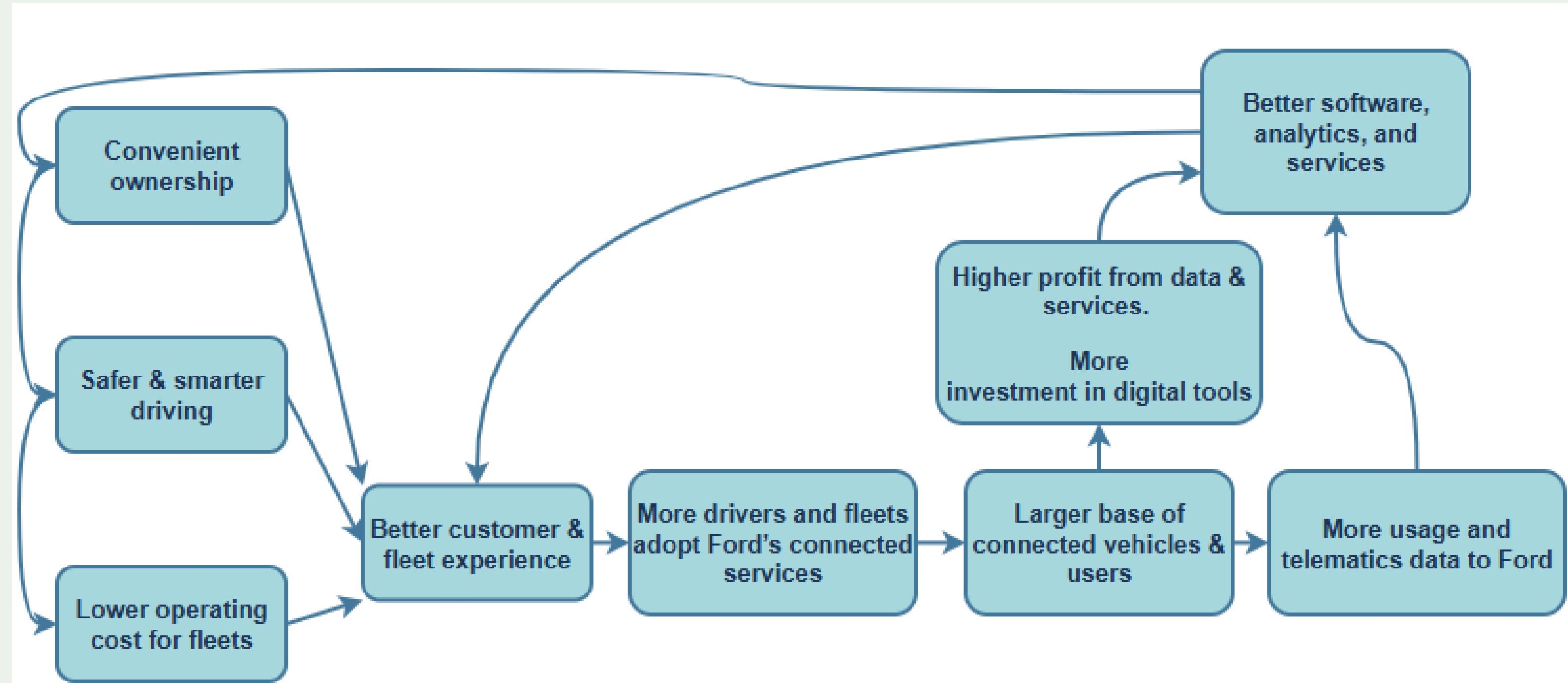
Physical pipeline stays, but Ford's digital/data hub sits **in the center**

Connected vehicles, dealers, and customers **send real-time data** to Ford

Ford **sends back** updates, insights, and recommendations

Value chain becomes a **hybrid pipeline + data platform** with better coordination and personalization

Ford's Data-Driven Virtuous Cycle



More connected users → more data → better software and services → higher value, loyalty, and profit → more investment in digital → even better services.

Digital Technologies & Ford's User Experience

- Connected Ecosystem: FordPass & SYNC enable remote control, navigation, and OTA updates; usage → data → smarter AI → better experience.
- Personalization & Intimacy: Vehicle & app data provide tailored alerts, offers, and fleet insights (Ford Pro).
- Seamless Digital Journeys: AR/VR exploration, online configuration, and integrated ownership reduce friction and capture preferences early.
- Accessibility & Trust: Remote diagnostics, digital interactions, and sustainability initiatives enhance convenience, reliability, and brand loyalty.



How Digital Technologies Have Transformed Ford's Business Functions & Processes



Ford is transforming its plants into Industry 4.0 smart factories, using IoT sensors for predictive maintenance and digital twins to optimize production lines and improve operational excellence.

The supply chain is being enhanced with end-to-end visibility and analytics, with real-time parts and logistics tracking and demand forecasting using sales history, macroeconomic data, and vehicle telemetry to improve coordination and resilience.

Ford uses digital simulation, analytics, and connected-vehicle data to design new features, applying virtual testing and machine learning to optimize EV range, battery management, and driver-assist systems, driving product innovation.

Digital technologies have shifted Ford from one-time transactions to lifelong customer relationships, using AI-driven segmentation, recommendation engines, online sales funnels, and integrated CRM platforms to deepen customer intimacy.

Ford Credit integrates digital tools and AI—automated credit scoring, customer portals, and real-time risk models—to enable AI-driven decisions that capture more value while managing risk.

Digital technologies are transforming Ford's organization and governance through real-time decision dashboards, agile ways of working, digital collaboration tools, and continuous employee upskilling to support data-driven adaptation.

Conclusion & Key Takeaways



FORD HAS EVOLVED FROM A TRADITIONAL VEHICLE MANUFACTURER TO A CONNECTED MOBILITY AND SOFTWARE-DRIVEN COMPANY.



DIGITAL TECHNOLOGIES ENHANCE CUSTOMER INTIMACY, PERSONALIZATION, AND LIFETIME VALUE.



DATA FROM CONNECTED VEHICLES POWERS PRODUCT INNOVATION, FLEET OPTIMIZATION, AND OPERATIONAL EFFICIENCY.



THE HYBRID MODEL STRENGTHENS ECOSYSTEM ENGAGEMENT AND SHIFTS VALUE CREATION FROM ONE-TIME SALES TO CONTINUOUS, DATA-DRIVEN SERVICES.

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**THANK
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