The Auto Power Shift to Data: From Asteroid to Data Sandwiches and Exchanges

Spring 2019, Chris S. Langdon, PhD, Research Associate Professor, Drucker School, CGU, chris.langdon@cgu.edu, https://research.cgu.edu/drucker-customer-lab/

This is a sequel to our "Auto Service Shift and 7 Gaps." Back then our meta-research suggested a pronounced shift of business toward services (see Figure), which in turn creates immediate gaps in capabilities, such as our choice of 7. Now, we've abstracted further and simplified our gap analysis to focus on a key source of advantage in the digital service future. Consequently, we highlight the role of data, and the importance of mixing and matching different data types (creating "data sandwiches"), a capability that may become natural to automakers as it interacts well with their current strength of systems integration.

Destruction of an Ecosystem

66 million years ago a massive asteroid hit the earth and triggered the demise of the mighty dinosaurs (Bardeen et. al. 2017). They had emerged as the dominant species in the Cretaceous period, constantly improved through evolution, nature's built-in continuous improvement process (later "rediscovered" by Toyota as Kaizen in its lean production system; Womack et al. 1990). Dinosaurs had been perfected - like today's motor vehicles; they are powerful, versatile, and they rule globally. While the tale of their extinction has been used - and overused - time and again, it may be quite fitting for the auto industry and its giant supplier base.

China's Electrification Asteroid

The asteroid for the auto business is already in clear sight. It is China's response to urban air pollution: mandated electrification of traffic. And it has been coming for decades. What started with a ban of two-stroke mopeds in 2000 in China's capital, Beijing (Viard & Fu 2015), is being expanded across regions and other vehicle types, such as commuter buses and now individual cars. The moped ban instantly created the world's largest fleet of electric bikes and scooters. Similar results with commuter buses: In 2017 China had about 99% of the world's electric buses in service, approx. 380,000 units - compared with less than 200 in all of Germany, for example (Hodges 2018). Now, China's Ministry of Industry and Information Technology (MIIT) mandates 25% new energy vehicles (NEVs) by 2025 (MIIT 2017). This is asteroid territory: For one, 2025 is only one vehicle generation away and approaching rapidly. For another, 25% is massive. For example, pick VW, today's best-selling foreign brand in China (Marklines 2018): A 25% NEV quota for China would dramatically outstrip the brand's EV production plans for the entire world (Zoellter 2018). The struggle to respond invokes comparisons with Bruce Willis trying to safe our planet from an asteroid in the 1998 Hollywood blockbuster Armageddon: The mood oscillates between confidence, for example presenting exciting EV show cars; and consternation, as witnessed in the endless struggle regulating diesel emissions in Europe.

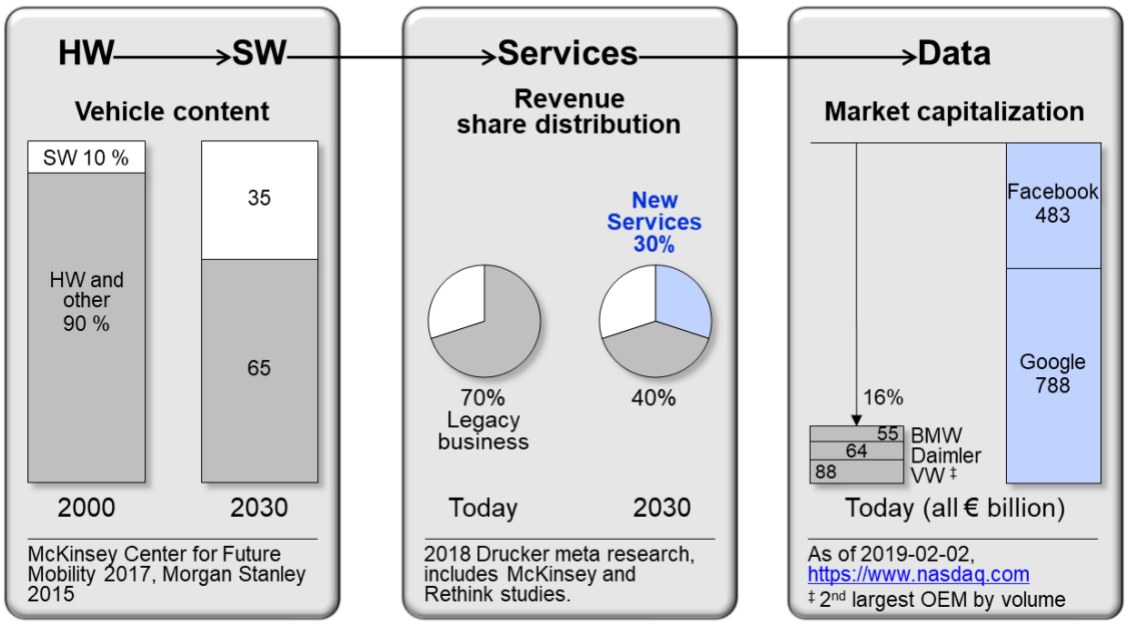

Figure: Auto Revenue Shift to Services and Data Power

The Auto-less Auto Company

China's new energy vehicle mandate is like an asteroid because it destroys the foundation of today's ecosystem. The problem is not that factories and supply chains have to be retooled, or that it takes software developers instead of mechanical engineers. The problem is that the vehicle itself will no longer be the source of power in the industry: no matter if it is electrified, connected, autonomized … or if it comes in bianco-eldorado-white or truffle-mica-gray … or with predicted music or personalized micro-climate zones. The vehicle will no longer be a source of power. For one: If the Chinese are gearing up to build electric vehicles faster than foreigners and if a startup, such as Tesla, can outsell entrenched luxury leaders like Mercedes-Benz, BMW and Audi (Neil 2018), vehicles are no longer a barrier to entry and consequently, power is slipping away from them. For another: "Apps & Alexa" shift buying habits away from traditional auto-centric marketing & sales to more direct ways of interacting with consumers (Crosby & S. Langdon 2017), which are already dominated by powerful and rich social media companies like Google. Ultimately, history may not repeat itself exactly, but the auto future may follow the path of computing, which evolved from hardware into the cloud - well foretold in the seminal analysis of "The Computerless Computer Company," a winner of the annual McKinsey award for best Harvard Business Review article (Rappaport & Halevi 1991).

From Hardware to Data

Power - and profit - is shifting from the vehicle to data (see Figure). It sounds provocative - particularly to auto people - but it's neither magic nor a surprise. We have seen it before in content businesses ranging from newspapers to music (Schlueter Langdon 2018). Newspapers felt well protected behind printing presses and last mile delivery only to be outflanked by data. While paper-based publishers went from top to bottom, data hogs like Google and Facebook arose to dominate advertising (MGT 317). The switch did not happen overnight, and there are always exceptions but even storied media brands like *Time Magazine*, *Newsweek* and *The Washington Post* had to be rescued by philanthropists.

Data Apples and Oranges

The switch to data as the new center of the ecosystem is a big challenge. Problems start with our common misunderstanding of data. With data most of us struggle to separate apples from oranges. No wonder: Hardly any school program makes “Data” a mandatory class, like “Statistics,“ for example. And while most of us don’t feel comfortable with statistics, at least we’ve developed some understanding about it. With data, we don’t even have that. So, it’s no surprise that few dominate data, such as Google and Facebook (see Figure), while most stumble. The list of complications with data is a long one (MGT 349/505): from cleaning it (missing values, inconsistent formats), cataloging it (definitions, metadata), measuring size (in bytes or length of a timeseries), quality (completeness or freshness) and information content (categorical versus ratio-scaled) to bias and heavily unbalanced datasets.

Data Sandwiches

Furthermore, from an economics perspective the value of individual data types appears to be somewhat limited. Roughly speaking, value compounds by stacking or combining data. It’s a bit like a sandwich. A slice of ham sells for $0.10, a slice of cheese for $0.10, and a roll of bread for $0.10, so $0.30 in total. If stacked into a ham-and-cheese sandwich the same ingredients suddenly sell for $2. Yes, there is labor, rent, equipment and permitting involved. Yet, sandwich margins dramatically exceed component margins. And sticking with the sandwich analogy, the recipe matters: peanut butter and jelly work great together, jelly and cheese - well, not so much. That’s the data story: Despite all the hype about ‘Big Data’ and with the exception of very few applications, such as neural networks, it is less about the volume of data but more about combining different data sets (MGT 349/505). So, power comes with data types and recipes or algorithms.

Cheese Only, and Data is NOT the New Oil

This is where one problem lies for auto incumbents: They are stuck with cheese only, so to speak. OEMs only have a few data types. And, unfortunately, the data is not even scarce. All OEMs have cheese, making the data abundant. Furthermore, it takes only one OEM to sell cheese for the rest of world to have cheese and benefit from this data type. Here is also where all analogies with atoms, such as cheese or “Data is the new oil” are breaking down: Data is digital, and a single copy is sufficient for rest of world to benefit from it. One leak would be sufficient. Absent collusion economic theory suggests that there will be a leak. It’s the classic prisoner's dilemma scenario in game theory. And with one leak all could be at risk. For example, pirated songs destroyed the traditional hardware-based music business, which is recovering as a data-driven, cloud-based business selling subscriptions and event entertainment. Urgency is probably warranted because the gates may have been opened already, as Volvo and Renault-Nissan have decided to work with Google on next generation vehicle dashboard systems (Korosec 2018 and Frost 2018 respectively).

Data Exchanges to the Rescue

Fortunately, OEMs could be experts at making sandwiches, because they are already expert systems integrators. Instead of making an entire car from scratch, OEMs buy thousands of parts

and integrate them. By the 1920s when Henry Ford automated the vehicle business with his giant River Rouge factory in Michigan, he was 100% vertically integrated, owning the whole supply chain (Womack et. al. 1990). Today, GM, for example, produces only about 20% of a regular combustion engine car, and with its battery electric Bolt only 11% (Trivedi 2018). Instead of making parts, OEMs have become master systems integrators. They create requirements specifications, then invite suppliers into a bidding or request for quotation (RFQ) process to bid on specific parts, and conduct elaborate parts and systems tests (Clark & Fujimoto 1991). Here is where the new gold will be, because all of these activities are already inherently data-heavy, with creating, processing and evaluating variables, measures, benchmarks and metadata. It just hasn't been seen through this lens, and therefore, not organized and managed as a data business. Key to success with their own data is access to other, complementary data, in order to create data sandwiches. Here is where traditional suppliers and new data exchanges would be valuable business partners. Exchanges in particular, such as the Telekom Data Intelligence Hub, could add value, because of their neutral role, data security, ease of data governance features, and cost advantages.

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