Monetization Considerations for Connected Vehicles

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Second only to mobile phones, the burgeoning world of the Internet of Things (IoT) is being led today by one 'thing' more than any other: The Connected Car.

Like many other IoT efforts, the main challenges currently facing connected cars—and the broader category of connected vehicles like heavy equipment and machinery—have little to do with technology itself. The foundational technological components making connected vehicles possible (on-board computers, telematics devices, specialized sensors, internet connectivity, cloud-based data stream management, etc.) are largely mature, and are approaching a point of commoditization and ubiquity. In many cases, the point of commoditization and ubiquity for these capabilities has already arrived. Instead, the main hurdle standing before anyone seeking to capitalize on the connected car business is just that: *How, exactly, does one construct a viable business model where successful capitalization (or "monetization") is possible?*

There is no magic formula for exactly how to make money in the connected vehicle space, and this paper does not endeavor to offer that. Like any marketplace based on emergent and ever-growing technical capability, the specific services that connected car consumers desire and the structures under which they pay for them is guaranteed to change over time. There will be many successful monetization models within the connected car space and many that will fail.

Look no further than the history of the mobile phone marketplace for an apt analog. Early adopters paid literally thousands of dollars to device manufacturers and service providers for phones that only worked in strictly limited coverage areas. Eventually providers learned that their addressable market was massively broadened by removing the barrier to entry imposed by a significant up-front device expenditure by offering multi-year contracts for service. This made up the cost of the device over time and developed a more tightly tethered relationship to the consumer. Today, mobile phone consumers are more frequently demanding (and providers are more frequently providing) devices and services that are free of any contractual commitment.

Instead of offering an improbable monetization crystal ball, the goal of this paper is to provide a framework for understanding the connected vehicle space, to outline the challenges and opportunities standing before the various business models and players within the space, and to utilize the lessons learned from other markets to offer guidelines, best practices, and guardrails to maximize the chances for commercial success.

What are the offerings?

The number of individual connected car services that are available or coming to the marketplace is large and continues to grow. To explore the opportunities available for connected car monetization, it is best to first break down the constituent component offerings which fall under the umbrella term 'connected car', as monetization requirements and challenges differ depending on the type of offering. The following model divides connected car offerings into four basic categories:

- **Transportation as a Service** – Any of the various models that are alternatives to traditional sale or lease of a vehicle. All require some amount of connectivity to work. Examples include peer-to-peer car sharing, multi-entity (group) leasing, and fleet subscriptions.

- **Post-Sale/Lease Secondary Services** – The wide range of complementary services offered to vehicle owners/lessees after initial vehicle acquisition, which require perpetual connectivity to support delivery. This broad category includes everything from on-board services delivered by an OEM to on-board services delivered by an after-market party to indirect vehicle related purchases (e.g. fast-food purchase at a drive thru restaurant where the vehicle securely delivers payment). Other examples include entertainment delivery, driver experience personalization, roadside assistance, mapping and geo-fencing, and human-assisted services such as on-demand concierge parking, intelligent preventive maintenance subscriptions, and on-demand white-glove care plans.

- **Road Use Measurement Services** – The collection of services directly based upon telematics-sourced data streams delivering usage metrics like location, speed, trip duration, and fuel consumption. This category includes seemingly disparate models such as usage-based insurance, road-use-based taxation, and commercial fleet tracking and management.

- **Secondary Data Stream Monetization** – The analysis of individual driving habits and patterns, based largely upon the same telematics-sourced data streams utilized by Road Use Measurement Services. Data streams are used to deliver opportunities for secondary sales of additional goods and services offered to the consumer directly (e.g. personalized discounted insurance promotions) or to capture and sell the data to third parties (whether in anonymous/identified or in aggregate/detail form).

It is also important to note that connected vehicle monetization opportunities and models are not limited to B2C models. Many of the models mentioned within the four categories above can also be made available in B2B form, and others still have practical applicability only in a B2B context, such as fleet management, heavy equipment and machinery, and secondary sale of telematics data to third parties.

Who are the main players?

Like any other technology marketplace, there are many systems and vendors who necessarily belong in the back-office stack required to make any connected car endeavor successful. Some of these 'supporting cast' members will be addressed directly later in this paper, but for now it is important to categorize the 'lead players' in this narrative, the entities who will be on the front line offering monetized connected car services of all types to the market. This is the primary audience for whom this paper is intended.

- **Original Equipment Manufacturers (OEMs)** – Stating the obvious, the actual makers of vehicles themselves stand front and center in the connected car world, arguably better positioned than anyone to realize secondary monetization potential from a relatively captive audience. Examples in this category of players are household names: Audi, BMW, Fiat Chrysler, Hyundai, and Subaru.

- **Third-Party Device Manufacturers** – These devices can often connect to vehicle systems using the existing capabilities of On-Board Diagnostic (OBD) ports, which have been mandated equipment in all cars sold in the U.S. since 1996. Along with the connectivity offered by WiFi, cellular networks and Bluetooth, this group includes entities offering everything from aftermarket telematics devices to personalization and safety systems like Verizon Hum, and arguably includes mobile phones themselves. Very importantly, ubiquitous mobility providers Google and Apple factor heavily within this broad group.

- **Third-Party Service Providers** – Included here is any service provider that is largely or wholly agnostic to a car or device's manufacturer. Insurance and maintenance providers are perhaps the most important members of this group. However, the broadest definition of this category also includes providers of any service not directly offered by OEMs or third-party devices themselves: Connectivity networks (whether cellular, WiFi, or satellite-based), service providers who improve the driver experience (the HERE mapping app is one of many examples), and telematics-based fleet management services offered by companies like PeopleNet.

Where are the opportunities and challenges?

Above, we've defined four main business offering categories and three main categories of players. In all cases, we've cited many examples within every category. However, in no case should the examples and sub-categories cited within a given category of offering or player be construed to be a comprehensive list. But even within these admitted limitations, the challenge becomes obvious — there are dozens of possible combinations of 'potential player category to potential model category', and hundreds of combinations if every sub-category were matrixed to every sub-category. An exhaustive examination of monetization strategies within the connected car world would do just that — index every member of these two groups of categories against one another at a granular level, then provide a detailed SWOT analysis for each of the permutations.

Instead, this paper will address some key challenges and opportunities at a higher level, using a sampling of a few offering-to-player combinations as representative examples.

OEMs Monetizing Transportation as a Service

- **Opportunities** – Viable opportunities differ depending on the exact OEM in question and the exact TaaS model. For example, luxury brands such as Audi, BMW, and Bentley are best positioned to offer services which benefit from brand affinity and prestige, such as subscription or on-demand access to various models from among a fleet of vehicles (e.g. Audi's white-glove Audi on demand service). OEMs with a broader install base and lower ASP are better positioned to benefit from models like group leasing (e.g. Six 20-somethings renting a house together also lease a Fiat together rather than a traditional purchase or using a pay-per-use rental system like Turo), and from peer-to-peer sharing models (e.g. the "airport sharing" component of Ford's new Ford Pass offering).

- **Challenges** – Existing system infrastructure for selling/leasing cars was designed for no more than two names on a title or lease and must be dramatically enhanced or replaced. Managing vehicle inventory for subscription or on-demand access requires fleet management strategies and systems that must be tightly tailored to individual marketplaces, in terms of geography (BMW models most commonly desired in Seattle will differ from those most desired in San Diego), demographics (millennials want different cars than retirees), and days/times (different vehicles are needed for weekend trips with the family to the mountains versus weekday entertaining of clients). Effective and comprehensive fleet management, perfected by entities like Turo, remain elusive to OEMs entering the game, and will require a significant amount of trial-and-error on a market-by-market basis.

Aftermarket Device Manufacturers Monetizing Secondary On-board Services

- **Opportunities** – Most cars on the road now (and for a few years to come) do not benefit from OEM-provided connected services, but are being driven by consumers who will demand them nonetheless in what can be called a 'retrofit' model. Due to both the long lifespan of vehicles and the extensive amount of time it takes any OEM to go from concept to manufacture, the aftermarket is inherently positioned to be far more agile and much faster to market. Aftermarket devices are far more natively bound to drivers than to vehicles, so the services they provide can more seamlessly move from one car to another as desired.

- **Challenges** – OEMs are natively positioned to deliver these offerings at point of initial sale/lease, even to the point of treating them as 'loss leaders' and effectively giving them away in order to incent the vehicle purchase itself, or to make money solely on the accompanying service subscription that enables their 'embedded' devices, whereas aftermarket devices require an additional purchase and/or relationship on the part of the customer above and beyond what they are already paying for the vehicle.

Third-party Service Providers Monetizing Road Use Measurement Services

- **Opportunities** – Insurance companies are already leveraging the available data streams from embedded OBD systems to provide usage-based insurance to infrequent drivers (potentially opening up a new market segment), or to reward safe drivers with additional discounts on their premiums. Government entities, suffering from declining fuel tax revenues due to more efficient (and non-fuel-consuming electric) vehicles may begin to compensate by exploring more direct taxation models based on actual public road use, using data streams from embedded or 'add-on' telematics devices (e.g. the road-use-based taxation programs in trial in several U.S. states). Unlike many other on-board services which require an 'always connected' or 'almost always connected' state in order to work properly, most Road Use Measurement Services can work perfectly well even with just intermittent connectivity by using a data 'store-and-forward' model, thus removing the cost of and dependency on cellular or satellite network providers. Data can be uploaded sporadically via a driver's home WiFi or Bluetooth tethering to their mobile phone.

- **Challenges** – Effective market penetration will likely require 'device agnosticism', which will in turn require sophisticated data stream management platforms capable of organizing and transforming data from myriad sources and formats. Third-party device manufacturers may opt to offer their own (i.e. proprietary) accompanying secondary services, which may supplant the possibility of a vibrant 'open' market in which device-agnostic service providers can play. Lastly, any program designed to provide incentives and rewards based on behaviors carries the risk of creating a world of 'haves and have-nots', with the possibility of market backlash from those who drive a lot or those not awarded for premium behaviors.

OEMs Monetizing Secondary Data Streams

- **Opportunities** – The sensors vehicles are equipped with can produce data streams that the OEM may choose not to share with third parties. This data may be used to provide ongoing revenue streams to dealers (already suffering from a rapidly declining level of car ownership) or by actively incenting drivers to use them for maintenance based on predictive or reactive alerts to problem conditions. On a granular level, this data can be used to build driver profiles, which in turn can drive individualized direct marketing efforts for available add-on services, or the suggested purchase of a more suitable next vehicle when the time comes. On an aggregate level, this data can be sold to third parties for subsequent commercial purposes (e.g. insurance companies wishing to offer highly tailored products) or non-commercial purposes (e.g. municipalities wishing to do analysis on traffic patterns and road use).

- **Challenges** – OEMs tend to possess neither the mindset nor the infrastructure required to think and act like purveyors of data, as they are historically purveyors of steel. Consumers are ever more wary of implicit data collection, from a privacy standpoint and a security standpoint. OEMs will need to address these issues in ways that are currently foreign to them and protect both themselves and their consumers—including but not limited to measures such as issuance and enforcement of privacy statements, allowing customers to opt-out, and application of the same level of data security systems and policies used in many other realms.

What are the common themes? What can I do now?

Above we examined (at an admittedly high level) some basic connected car use cases and the opportunities and challenges that need to be considered when developing a monetization strategy. On the surface, these use cases appear to be vastly different from one another, and that is largely true. However, perhaps not so obviously, there are some common themes (and associated guidance) which can be divined from them. Regardless of the kind of entity you are or the kind of offering you are considering, these themes are, in fact, nearly universally applicable across all potential connected car go-to-market efforts.

- **Get your Data House in Order –** Like every IoT initiative, the connected car is entirely dependent on the data streams produced by sensors and devices. It is also arguable that the many of the types of data at play within the connected car are of a highly sensitive nature. Knowing everything about how and where and when a person drives can be highly damaging in malicious hands, and stringently secure systems and policies must be put into place. Understanding that some data is about a vehicle while other data is about an individual, that there should not be a presumed permanent linkage between any vehicle and any individual, and that some data will need to go one place while other data goes elsewhere, requires sophisticated data management systems that can elegantly handle an ever shifting 'many-to-many-to-many' landscape of identity management. This is true whether the identity in question represents a person or a system or a car or a thing within a car. Wise organizations, even those whose initial offerings may handle seemingly non-sensitive data in a simplistic use-case, will put sophisticated data management systems in place at the outset in order to 'future-proof' themselves and lay the groundwork for perpetual market agility and consumer safety.

- **Embrace Your Data –** If you have access to data, even when it has no apparent direct influence on how you choose to charge for your offering, retain it anyway. Insights are always available via analysis of the consumption patterns of users, but are only possible if you keep the data in an organized, centralized, accessible place. Knowing how users consume a service, even if those metrics are not how they pay for that service, allows you to stay nimble in a market that is guaranteed to constantly shift and change. What do consumers value? How do they like to pay for things today, and is that the same answer as tomorrow? The answers to these and many other questions are yielded only through broadly-based consumption data retention and analysis. Even so, too many organizations believe that going to market quickly necessitates a 'data avoidance' strategy, which tosses away potentially valuable data whose value isn't initially obvious.

- **The Money Isn't in the 'Thing'** – In the IoT world in general, cautionary tales abound regarding the makers of 'things' who realized too late that the true monetization opportunity lay NOT with the 'thing' itself, but rather with the perpetual service that it unlocks. Companies like Nest, GoPro, and FitBit all learned this the hard way, trying too hard for too long to squeeze margin out of the one-time sale of their hardware, while ignoring the opportunity to instead build a tethered relationship to their customer via an ongoing, recurring service. Recurring, perpetual services provide an ongoing linkage to a customer that cannot be achieved via any once-and-done sales model, and build an annuity for the enterprise that keeps on giving and doesn't require constant reinvestment in costly customer acquisition. Companies that got this wrong were severely punished by their respective markets, while wise ones are those that decide early to regard the 'things' they offer as barriers to entry, and adopt strategies to put them in hands of consumers with as much ease as possible, betting instead on the long tail of profit afforded by paid recurring services.

- **Learn to 'Count the Beans' Differently** – Connected vehicle services, like any IoT-based services, lend themselves readily to recurring revenue business models. There are many benefits to recurring revenue models, for providers and investors and customers, so it's no accident that every industry (automotive included) has been and continues to explore ways to unlock and expand upon them. But recurring revenue success is measured by fundamentally different KPIs than the one-time-sale model is measured. Profit margins in recurring revenue models are often not fully realized at point of sale (the way the sale of an automobile is). They are realized over time, but with a 'long tail' of annuity-style profit once margin has been reached, and OEMs are especially challenged when it comes to being amenable to measuring their success in this way. The lessons learned by OEMs years ago when many also became direct lenders are the best analog for recurring revenue success available to them, and it may be wise for OEMs to consider housing their connected car strategies within their lending arms for this reason.

- **Take Engineers Out of the Equation Where You Can** – Agility and speed to market are of paramount importance in the connected car world, whether in regards to initial offerings or in reaction to changes in market conditions and consumer demands. Because no one can possibly know exactly which technologies will find success or all of the models via which consumers will wish to pay for them, and because the foundational technologies themselves are evolving at a faster pace than ever before, the wisest enterprises will understand that slow and steady does NOT win this race. Organizations that show a willingness and ability to get to market quickly, even if imperfectly, and to aggressively pursue multiple simultaneous monetization strategies knowing that not all will succeed—these will be the organizations that 'win' in the connected car space.

- **Prepare Back-office Systems** – Unfortunately, especially for mature enterprises like OEMs that have developed dependencies on legacy back-office systems, existing infrastructure was either not built to rapidly support new offering models like recurring revenue, and/or require expensive and time-consuming development resources in order to institute anything new. More modern (usually cloud-based) back-office systems offer not only dramatically shorter implementation timelines than legacy or home-grown systems, but also put the power of innovation and change in the hands of business users rather than engineers.

About Aria Systems

Aria Systems' cloud-based monetization platform is the consensus analyst choice, top ranked by leading research firms. Innovative enterprises like Audi, Subaru, HERE, and Verizon Telematics depend on Aria to accelerate time to market and increase flexibility, enabling them to maximize customer value and grow recurring revenue through subscription and usage-based offerings.

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