Partnering Transactions in the Automated Vehicle Industry and Intellectual Property

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INTRODUCTION

In this paper, we studied technology transactions and intellectual property rights in the automated vehicle industry. Transactions between companies included agreements involving the development, licensing and supply of technology, products and services. These types of transactions are the means by which the automated vehicle industry will reach widespread commercialization. To better understand these transactions and their effects, we reviewed the reasons why companies partner by sector and identified key issues in strategic alliance negotiations.

WHY COMPANIES PARTNER; PREVALENCE OF PARTNERSHIP

Developing and commercializing a new technology product on a global scale can be too complex and too expensive to tackle alone. Strategic alliances can solve the dilemma that small technology companies face. First, strategic partners can provide funding opportunities that may not be available otherwise, or that may be less dilutive if equity is not required. Second, strategic partners can provide access to key complementary technologies, allowing small technology companies to focus on the technology areas where they can add the most value. Third, strategic partners can provide access to infrastructure that small technology companies may not have, such as manufacturing, distribution, or service infrastructure and regulatory expertise. And finally, more established strategic partners can lend their credibility to startups that would otherwise be relatively unknown, helping to build trust with investors, other business partners, and the public.

Likewise, the partner considering entering into a strategic alliance with a technology company may have several reasons for providing funding, technology, infrastructure, or credibility to the company developing and commercializing a new product. First, the partner may gain early or exclusive access to next generation technology developments, thereby allowing it to enter a new market earlier than it would be able to do without the other company's assistance. Second, especially when an equity stake is involved, there can be a substantial reward for investing early in a company that is successful. And third, the partner may be able to access such new technologies with less risk than if it tried to develop them internally.

With that backdrop, we find partnerships to be prevalent in the automated vehicle industry. The reasons for this include:

- the technology and the products are rapidly evolving – some predict widespread availability by 2025, and first production models by 2019 or 2020;
- the costs to develop and deploy are huge – more than $80 billion has been invested so far;
- many technologies are involved and there is a need for new technologies and adaptation of existing technologies in nearly every area, including cloud, connected (smart phones, machine-to-machine, new protocols), green (batteries, new materials, fleets), infotainment, big data, mapping, safety, components (chips, sensors, cameras), automated driving (machine learning/artificial intelligence), human-machine interface, mobility-as-a-service, and vehicles;
- there are disparate types of companies in the industry, including traditional OEMs, new OEMs, automated driving systems companies, auto parts companies, and ride hailing services;
- the competition for talent is fierce, especially for automated driving systems experts – partnerships are a way of pooling resources;
- disruption of personal vehicle ownership is part of the evolution of the industry, meaning that there is more than one major change going on at once, so it is unlikely

that one company can excel in both areas (manufacturing the vehicle and systems, and providing the service) and partnerships are essential; and

- as of today, there are no clear market winners, so companies are hedging their bets and entering into multiple arrangements.

AUTOMAKER STRATEGIES

There appear to be three dominant strategies among automakers. The first of these strategies is to build their own automated vehicle platforms and develop key sensors, algorithms, and capabilities in-house rather than buying them. The primary reason for this approach seems to be that automakers don't want to be beholden to third parties to make their automated vehicles work. They would greatly prefer to own technologies that are the highest-value components of automated vehicle systems, which means that if they had to pay third parties for them, their costs would be higher and their profits slimmer.

While developing their own automated driving platforms seems most attractive all other things being equal, automakers seem to be running up against limitations in attracting the best engineering talent in key automated driving technology areas. Accordingly, some automakers have decided to try to acquire the talent they need by buying a controlling interest in promising startups developing automated vehicle platforms, and then giving those controlled-but-separate entities the independence and financial incentives they need to retain key personnel. However, even with earn-outs and other financial incentives for acquired talent, many startup founders and boards know that their talents and technologies are worth more than automakers are willing to pay to acquire them, and are reluctant to tie themselves exclusively to one manufacturer. As a result, most automakers have found themselves making smaller investments and entering into non-exclusive collaborations with technology companies that can provide key components of automated vehicles systems.

Automakers are also trying to secure new customers for their automated vehicles in fleets owned by ride-sharing companies and other mobility-as-a-service providers. Automakers know that, over time, individual car ownership is predicted to decline, and that their continued competitiveness depends on their ability to serve fleet customers or, in the alternative, shift to a model in which the automakers themselves own and service vehicle fleets and rent them to ride-sharing or mobility-as-a-service customers. In either model, automakers need to ensure that their automated vehicles are capable of plugging into whatever ride-sharing services end up succeeding in the marketplace, so they are hedging their bets and investing in and partnering with ride-sharing companies, and helping them develop and deploy their automated driving platforms.

AUTOMATED VEHICLE TECHNOLOGY COMPANY STRATEGIES

Technology companies have followed one of two paths, the first of which is to provide a complete automated driving solution, including all hardware, software, and service overlays necessary to convert an automaker's vehicles into fully-automated vehicles and add them to a ride-sharing fleet. The problem with this approach is that it is very expensive, requiring talent and technology in a variety of engineering disciplines and very long-term commitments from investors. Only large companies like Google, with its cash-producing ad business and support for "moonshot" projects, or automakers and ride-sharing companies, with other sources of steady income or financing war chests, have the resources to steadily fund and commit to such projects, meaning that the startups that have aspired to build their own soup-to-nuts automated vehicle platforms have generally found it in their interest to partner early with a larger company. Of course, not all technology companies have aspired to build complete automated driving platforms; there is a large market for components for these systems, particularly selling to automakers and platform developers that don't have the resources or desire to produce all automated vehicle components. This has allowed a multitude of startups and other technology companies to specialize in providing one part, or a subset, of key technologies.

Automated vehicle technology companies are eager to partner with automakers because the automakers are their primary customers, and technology companies are anxious to have their products and technologies designed into vehicle models. At this stage, technology companies are generally just demonstrating their capabilities in extended proof-of-concept and joint development efforts, but the hope is that by partnering with automakers early, they will be able to influence the automakers' design decisions in favor of purchasing more products and technologies from them rather than from their competitors. Similarly, component providers have partnered with platform technology companies and automakers to provide key sensors, processing units, or other technology for integration in to the platforms' reference designs. Platform technology providers also see opportunities to help automakers compete with each other by integrating their platforms into models that would otherwise lag in the automakers' own competition to develop automated driving platforms.

AUTO PARTS SUPPLIER STRATEGIES

Traditional auto suppliers like Bosch and Delphi have found themselves in fierce competition with technology companies and even with the automakers to supply the key components of automated vehicles. It seems increasingly likely that the most premium-demanding parts of automated vehicles will be sensors and processors of various kinds, together with the software that makes them work, and traditional auto parts suppliers risk being pushed down the value chain by technology company newcomers. Seeing this threat, auto suppliers have their own automated vehicle platform development efforts, generally focusing on the key elements of "level 1" and "level 2" autonomy that can be implemented in existing car models (adding features like lane keeping assistance, adaptive cruise control, and automatic emergency braking), while also trying to build their own fully-automated platforms to compete with other platform providers. Auto parts suppliers hope that their strong relationships with automakers and their experience with quality management will give them an edge when it comes to supplying systems that have to work in life and death situations.

MOBILITY SERVICES STRATEGIES

Mobility services companies seem to be primarily trying to acquire vehicles and technology. They want to ensure that, whether or not their own automated driving platforms prevail, their services are compatible with the prevailing platforms and the broadest range of automated vehicle models, so their fleets can consist of a variety of vehicles to appeal to a variety of audiences. They also want to avoid being locked-in to a single supplier, or locked-out of exclusive relationships between particular automakers and other ride-sharing services (whether due to business concerns or compatibility issues). To the extent that ride-sharing companies are developing their own automated vehicle platforms, they too want to sell to automakers.

KEY ISSUES IN STRATEGIC ALLIANCE NEGOTIATIONS

While the details of each transaction differ and there can be a multitude of sticking points in the negotiation of any particular strategic alliance, we often find that the most important issues fall into several recurring themes. Typically, both parties negotiate these terms in the context of a desire to get the current deal done while still protecting their ability to conduct business outside of the current deal by not giving so much in areas such as intellectual property rights, exclusivity, and length of commitment that they are constrained from generating revenue from other sources.

1. Intellectual Property Rights. Ownership of, and licenses to, intellectual property rights in technology developed under a collaborative development agreement are usually among the most difficult issues. With regard to ownership, it is fairly straightforward to say that each party will retain the intellectual property rights to technology that it develops, but when there is joint inventorship of patentable inventions, or joint authorship of software, joint ownership as the solution is anything but straightforward - the rights and obligations of joint owners vary depending on the type of intellectual property right (e.g. patent, copyright) and the jurisdiction (e.g., U.S., EU, Japan). Accordingly, one alternative to joint ownership that parties often settle on is to have each party own the intellectual property rights to technology developed under the agreement in its core technical area. That way, ownership resides with the party who is most interested in protecting and enforcing the relevant intellectual property rights, and each party is able to protect its core technology. The non-owing party would, in that case, have an appropriate license to the jointly developed technology, which is usually good enough for jointly developed technology outside its core area.

The devil is in the details, and strategic alliances often involve a myriad of licenses and cross-licenses that may differ in rights and scope, depending on considerations such as the business each party is entitled to pursue using the other party’s technology during the term and after termination of the agreement, whether the technology existed prior to the agreement or was developed under the agreement, and whether it was solely or jointly developed. To the extent that a great part of a company’s technology is protected as trade secrets, collaboration agreements often include detailed provisions regarding confidentiality and access, such as limitations of access to particular listed individuals and restrictions on where sensitive documentation or code can be stored and the security protections that are required.

2. Rights to Data. Negotiating rights to data can be highly contentious. This comes up primarily in two contexts: data that can be used to train AI algorithms, and customer information. All of the participants in automated vehicle development believe that the data associated with automated vehicle use, such as camera images, event logs, trip information, and user-generated data, will be extremely valuable both for further development of automated vehicle technology and for other forms of monetization.

A key element of negotiations regarding strategic alliances between automakers, technology companies, and ride-sharing companies has been who has access to what data associated with use of the vehicles at issue.

Data doesn't easily fall into an intellectual property rights legal regime. The selection and organization can be protected by copyright, but not the data itself. A system may be subject to patent protection, but not the data that resides in the system. In the EU, there is database protection but the scope is somewhat limited. Data may qualify as a trade secret of both parties, and the only protections will be those negotiated by contract. Data may contain personally identifiable information, and if so, the rights to use and disclose that data are limited by the privacy policy under which it was acquired and by applicable law, which of course varies widely by jurisdiction. "Ownership" of data is not the right question; rather, the parties need to focus on who collects, stores and uses the data, and how, while keeping the data secure and complying with law and regulation.

3. Exclusivity. Typically, even where the general concept of exclusivity is agreed to by the parties, much negotiation occurs regarding the scope (or field) of the exclusivity, any exceptions (such as a party's pre-existing agreements, or acquisition of a party), the duration of the exclusivity, the requirements to maintain exclusivity (such as minimum payments or meeting development milestones), and whether a failure to achieve those requirements terminates the agreement or renders the relationship non-exclusive. Precision in defining the scope of the exclusivity is important as well as the intellectual property rights that are the subject of the exclusivity.

4. Geography. In regulated industries in particular, deals are often negotiated on a jurisdiction-by-jurisdiction basis because of variations in legal requirements. For example, in the automated vehicle industry, a fleet operator may choose a different vehicle manufacturer for one country vs. another country, or even by state, or for city operations vs. suburban or rural operation. Or, a traditional OEM that sells vehicles both domestically and internationally may work with different automated driving systems vendors in different countries. A typical issue is whether a partner has a right of first negotiation or right of first refusal to extend the agreement to new jurisdictions that are not part of the initial agreement scope.

5. Commitment. While termination for breach is typical, other causes for termination are negotiable in each deal. Termination for convenience is one example – whether a party can simply walk away, and if so, what compensation may be due to the other party for the opportunity cost.

6. Revenue Sharing. Payments are always a key term in any agreement. The mobility-as-a-service business model is based on recurring revenue, which is not the case for traditional auto sales or auto parts sales. Even if not operating the service and receiving that revenue directly, the participants in the service offering (OEMs, the automated vehicle systems vendor) may want to share in the upside.

DEVELOPMENT OF STANDARDS

Automakers want to design their vehicles once for sale to a variety of fleet and individual customers, and they will push for the development and implementation of standards that allow their automated vehicles to operate on a variety of ride-sharing networks. The development and implementation of those standards will involve cross-licensing opportunities, as it is unlikely that any one system or platform will prevail over all others in the marketplace. Automated vehicle platform developers may see advantages, however, in wholly proprietary systems. The parties to collaboration agreements often negotiate whether developed systems will be open or closed to the addition of third-party products, e.g. whether APIs will be exposed.

The areas that are most ripe for standardization are the communications interfaces between automated vehicles and between layers in the stack comprising automated vehicle platforms. Communications standards probably will not be controversial, and may be dictated to some extent by regulatory demands, as it is anticipated that automated vehicles will be expected to communicate their position, direction, status, and anticipated changes to surrounding cars, and perhaps even to relay certain sensor data about the environment, as a failsafe in the event that a nearby vehicle's sensors are not working properly. That arena of standardization has positive network effects, where the standard benefits all of its participants, and we expect to see considerable collaboration in developing vehicle-to-vehicle communications standards.

What may be more controversial is the development of standard methods for one layer of a platform to communicate with other layers of the platform and with drivers. For example, the sensors in an automated vehicle all need to communicate with a central processing unit in order to synthesize all of the data produced by those sensors into situational awareness for the vehicle, despite the fact that the sensors are likely to be produced by a variety of component suppliers, each of which would like to tie customers in to their products to a certain extent, rather than make it easy to substitute a competitor's component. Similarly, automated driving platform providers will seek, to some extent, to tie their platforms to the user interfaces, content, and services constituting the "experience" of driving autonomously, so that they can collect data and sell products and services through such interfaces.

Even if a company's automated vehicle platform does not succeed commercially, its patents may provide commercial benefits. For example, if a company patents pieces of its technology that become de facto standards, it will have leverage when patent litigation looms (likely after the commercial release of automated vehicles), and patent cross-licenses become a necessary cost of doing business in the automated vehicle industry. While it may be difficult to completely avoid "format wars" of this kind, and we expect platform suppliers to select preferred component suppliers and offer their platforms to automakers as a reference design "package" (which arrangements will involve commercial transactions between the component suppliers and the platform suppliers), there is a market for technologies that abstract the various layers of automated driving systems so that they can be interchanged with one another more easily.

CULTURAL CONSIDERATIONS

In our technology transactions practice, and in our research and interviews with companies in connection with preparing this paper, we observed some differences in the ways that technology companies approach deal-making compared to the automakers' and traditional auto parts suppliers' culture of deal-making, which could be relevant to understanding what deal points are negotiated the most heavily and what deals are more likely to get done than others. We found that technology companies tend to be much more risk-taking in their products and culture than traditional automakers. This is not surprising, and we think this relates to the fact that, generally, the products of the technology industry have historically not been capable of injuring or killing people. Technology products are routinely shipped in "beta" versions and even products that are considered mature are continuously updated with security patches and new features. In contrast, automakers are accustomed to a dynamic where their products are safety-critical, recalls are expensive, and all product versions must be supported for a lifecycle of at least twenty years – an eternity in the technology industry. We think this has slowed the process of deal-making, because automakers want greater risk protection in the form of liability for warranties and indemnities than technology companies are willing to provide or indeed can rationally provide given their economics and the stage of technological development in this industry.

On the other hand, we see signs that automakers are adapting to the more risk-driven culture of technology companies, and that technology companies are coming to terms with the necessity of rigorously proving the safety and longevity of their technologies before bringing them to market. We think both technology companies and automakers can learn a lot from each other, and they seem to think so too, based on the large volume of collaborations that we have seen and that have been announced to date. And there is little doubt that the acquisitions we are seeing indicate that automakers and auto parts suppliers see automated vehicle technology as a strategic necessity, and that they understand their need to acquire or develop technology expertise and technology company culture in order to remain competitive in this century.

KEY TAKEAWAYS

Companies in the automated vehicle industry are likely to continue to enter into partnering transactions at a fast pace before we see substantial consolidation. The reasons for this include the number and complexity of technologies involved in automated vehicles, and the fact that not only is there a change in the vehicles themselves, but also in the transportation industry with the transition to mobility-as-a-service.

About Mcity
Mcity at the University of Michigan is leading the transition to connected and automated vehicles. Home to world-renowned researchers, a one-of-a-kind test facility, and on-road deployments, Mcity brings together industry, government, and academia to improve transportation safety, sustainability, and accessibility for the benefit of society.

REFERENCES

1. Bles, W., Bos, J.E., de Graaf, B., Groen, E. et al., “Motion Sickness: Only One Provocative Conflict?” Brain Research Bulletin 47(5):481-487, 1998.

2. Bos, J. E., S. C. de Vries, M. L. van Emmerik, and E. L. Groen. 2010. “The Effect of Internal and External Fields of View on Visually Induced Motion Sickness.” Applied Ergonomics 41(4): 516–521. doi:10.1016/j.apergo.2009.11.007.

3. Butler, C., and M. J. Griffin. 2009. “Motion Sickness with Combined Fore-Aft and Pitch Oscillation: Effect of Phase and the Visual Scene.” Aviation, Space, and Environmental Medicine 80(11): 946–954. doi:10.3357/ASEM.2490.2009.

4. Chang, C.H., Pan, W.W., Chen, F.C., and Stoffregen, T.A., “Console Video Games, Postural Activity, and Motion Sickness during Passive Restraint,” Experimental Brain Research 229:235-242, 2013.

5. Da Silva, M.G., “Measurements of Comfort in Vehicles,”Measurement Science and Technology 13(6):R41, 2002.

6. Diels, C. and Bos, J., “Self-Driving Carsickness,” Applied Ergonomics 53:374-382, 2016.

7. Donohew, B.E. and Griffin, M.J., “Motion Sickness: Effect of the Frequency of Lateral Oscillation,” Aviation, Space, and Environmental Medicine 75(8):649-656, 2004.

8. Flanagan, M.B., May, J.G., and Dobie, T.G., “The Role of Vection, Eye Movements and Postural Instability in Etiology of Motion Sickness,” Journal of Vestibular Research 14:335-346, 2004.

9. Gianaros, https://www.ncbi.nlm.nih.gov/pmc/articles/ PMC2910 410/, 2001.

10. Golding, J.F., “Motion Sickness Susceptibility Questionnaire Revised and Its Relationship to Other Forms of Sickness,” Brain Research Bulletin 47(5):507-516, 1998.

11. Golding, J.F., “Motion Sickness Susceptibility,” Autonomic Neuroscience 129(1):67-76, 2006.

12. Griffin, M.J. and Mills, K.L., “Effect of Magnitude and Direction of Horizontal Oscillation on Motion Sickness,” Aviat Space Environ Med. 73(7):640-646, July 2002, PMID: 12137099.

13. Griffin, M.J. and Newman, M.M., “Visual Field Effects on Motion Sickness in Cars,” Aviation. Space. Environmental. Medicine. 75(9):739-748, 2004a.

14. Griffin, M.J. and Newman, M.M., "An Experimental Study of Low-Frequency Motion in Cars," Proceedings of the Institution of Mechanical Engineers, Part D - Journal of Automotive Engineering 218:1231-1238, 2004b.

15. Howarth, H.V.C. and Griffin, M.J., "Effect of Roll Oscillation Frequency on Motion Sickness," Aviation. Space. Environmental. Medicine. 74:326-331, 2003.

16. International Organization for Standardization, "ISO 2631-1 1997: Mechanical Vibration and Shock - Evaluation of Exposure to Whole-Body Vibration - Part 1: General Requirements," Geneva, Switzerland: International Organization for Standardization, 1997.

17. Isu, N., Hasegawa, T., Takeuchi, I., and Morimoto, A., "Quantitative Analysis of Time-Course Development of Motion Sickness Caused by In-Vehicle Video Watching," Displays 35(2):90-97, 2014.

18. Jones, M. L. H., Ebert, S. and Reed, M. (2019). "Sensations Associated with Motion Sickness Response during Passenger Vehicle Operations on a Test Track" (No. 2019-01-0687). SAE Technical Paper.

19. Jones, M.L.H., Le, V., Ebert, S., Sienko, K.H., Reed, M.P., and Sayer, J.R. (2019). "Motion Sickness in Passenger Vehicles During Test Track Operations." Ergonomics, DOI: 10.1080/00140139.2019.1632938

20. Jones, M.L.H, Sienko, K., Ebert-Hamilton, S., Kinnaird, C. et al. (2018). "Development of a Vehicle-Based Experimental Platform for Quantifying Passenger Motion Sickness during Test Track Operations." SAE Technical Paper 2018-01-0028. DOI:10.4271/2018- 01-0028.

21. Lawther, A., and M. J. Griffin. 1987. "Prediction of the Incidence of Motion Sickness from the Magnitude, Frequency, and Duration of Vertical Oscillation." The Journal of the Acoustical Society of America 82(3): 957–966. doi:10.1121/1.395295.

22. Rolnick, A., and R. E. Lubow. (1991). "Why Is the Driver Rarely Motion Sick? The Role of Controllability in Motion Sickness." Ergonomics 34(7): 867–879. doi:10.1080/00140139108964831.

23. Sayer, J. R., M. L. Buonarosa, S. Bao, S. E. Bogard, D. J. LeBlanc, A. D. Blankespoor, D. S. Funkhouser, and C. B. Winkler. 2010. "Integrated Vehicle-Based Safety Systems Light- Vehicle Field Operational Test Methodology and Results Report." UMTRI Technical Report 2010-30. University of Michigan Transportation Research Institute: Ann Arbor, MI.

24. Suzanne Bell led this particular research study while serving as a Member of Wilson Sonsini Goodrich & Rosati.

25. Zhang, L., J. Q. Wang, R. R. Qi, L. L. Pan, M. Li, and Y. L. Cai. (2016). “Motion Sickness: Current Knowledge and Recent Advance.” CNS Neuroscience and Therapeutics 22: 15–24. doi:10.1111/cns.12468.