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## Business--models for the taxi of the future

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# Business-models for the taxi of the future<sup>1</sup>

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Past and present business-models .....	1
Simple economic constraints .....	1
Many (conflicting) policy objectives .....	2
A sudden multifaceted revolution .....	3
Three major changes in the taxi industry .....	3
Far reaching consequences.....	3
Future business-models.....	4
Strengths and weaknesses of the old industry.....	4
A business model and three (complementary) strategies .....	4
Business models and access to scarce resources .....	5
Subsidized transport and business models .....	7
Conclusion.....	9
References.....	9

## Past and present business-models

1. The extreme diversity of the taxi industry's existing business-models that can be seen from one country to another and even from one city to another is not due primarily to technical or economic fundamentals. It is essentially the result of local political will to structure the taxi industry, to shape the city, or to regulate labour relations.

### Simple economic constraints

2. From the origin, the economic constraints are simple: to transport people, it was enough to have a horse, a carriage and a coachman. The horse and the horse-drawn carriage demanded an investment of capital. On the other hand, driving a horse, as driving a car today, is an extremely low qualified job and it was easy to find candidates for this function. From the outset, there were people willing to invest in this industry and to hire other people to drive their carriages. But unlike a worker employed in a workshop, the coachman exercises his trade far from any control. Moreover, it is he who receives directly the amount of the fares.

3. For this reason, the relationship between the owner of the vehicle and his coachman was less frequently that of an employer to a wage-earner and rather that of an independent contractor leasing the

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<sup>1</sup> Discussion paper commissioned by the International Road Union (IRU) for the Taxi of the Future Reflection Group, together with two other papers: "What regulation for the taxi of the future?" and "Travel-chains / mode choice & the taxi of the future"

vehicle from its owner: paying a set amount for each shift and taking home fares and tips in excess of the lease fee.

### Many (conflicting) policy objectives

4. Very quickly, for reasons that will be discussed in the next section about regulation, it appeared necessary to regulate the activity. This regulation has been achieved by limiting the number of vehicles. Each vehicle was therefore assigned a license. The owner of the vehicle was thus able to rent both the vehicle and the license to the coachmen. From this point forward, it is essentially the evolution of regulation that has shaped the industry. Depending on how new licenses were granted, in different cities, the industry was more or less concentrated. Sometimes, as in Paris under Napoleon III, the public authorities may choose to give a monopoly to a single enterprise over the whole city. Conversely, at other times or in other cities, as a way to prevent the license owners from exploiting their drivers, the government has chosen to promote small scale enterprises by granting a single license to each coachman, resulting in an extremely fragmented industry with thousands of owner-operated cabs. Regulation can also induce these coachmen to found cooperatives as in the nineteenth century London where only cooperatives or cab companies were allowed to access the railway stations, or, as in the second half of the twentieth century, to have access to the radio frequencies that make it possible to benefit from radio-dispatch.

5. The Table 1 below, adapted from Schaller [2015, p.12] summarizes the different functions that integrated companies or fleets, dispatch bases, licence owners and drivers may take on. As highlighted in the table, fleets, as integrated companies, may perform a full range of functions from recruiting and training drivers to maintaining vehicles. Some of these functions may be taken by dispatch companies that, under this typology, dispatch but do not own taxicab vehicles. Separately, licence owners may recruit drivers and own vehicles but without driving them themselves. And drivers, of course, drive and sometimes own and maintain the vehicle.

**Table 1 — Taxi operational functions and responsibilities**

	Integrated companies or fleets	Booking platform companies	Licence owners	Drivers
Driver recruitment	X	X	X	
Driver training	X	X	X	
Dispatch	X	X		
Record keeping	X	X	X	X
Vehicle ownership	X		X	X
Vehicle maintenance	X		X	X

Source: adapted from Schaller [2015, p.12]

6. The licence owners rent the licences they own only when these licences have a marketable value, i.e. when regulation caps their number and allows their rental.

## A sudden multifaceted revolution

### Three major changes in the taxi industry

7. Three major changes have recently shaken these various business models and upset the taxi industry.

8. First comes a technology revolution with the smartphone. Smartphones allow geo-location of both customers and drivers, together with instant data transmission and lots of added services (maps, time, communication, etc.). This technology revolution absolutely broke all the old ways of handling the taxi business.

9. A second revolution is the network economy as exemplified by Google, Facebook, Amazon, etc. One cannot ignore them and have to pass through those companies to access to a worldwide customer base or merely to clients whose first reflex is to go through their networks when they are looking for any type of service.

10. The third revolution is the venture capital economy. It is now possible to raise funds to develop one's company with the objective to sell it to another bigger company without any notion of short-term profitability; whereas traditional taxi companies cannot afford to lose money for two or three years in a row, if so, they would disappear.

### Far reaching consequences

11. The consequences of these changes are far reaching. The first consequence is that technological entrance barriers have been removed:

- No need for any costly equipment on board in each vehicle
- No need to compete for limited radio frequencies
- And the new technology is scalable

12. The Table 2 below shows how these changes translate into comparative advantage for the new competitors.

**Table 2 — Comparative advantage**

	Traditional taxi	App-based platforms	Comparative advantage
Labour	Generally full time	Flexible and part time	Better adapted to fluctuating demand
Vehicle equipment	Taxi meter, rooftop sign, colour	Smartphone	Cheaper
Dispatch	Call centre	Server	Cheaper and faster
Optimization	Drivers experience	Algorithms	More efficient and surge pricing

13. The second consequence is that new competitors have no short-term profitability constraints. Some venture capitalists believe there is a global taxi market in which the winner takes all, i.e. that they will later raise the prices and will be very profitable. So, the new competitors use scalable technology and can afford to develop at the international level.

14. The third consequence is that the taxi industry can no longer operate as an independent business without close links to other networks. A growing part of the business will be intermediated because in this network economy people connect to Facebook, to TripAdvisor, to

AirBnB, or to Google Maps. So every day people use their smartphone to connect to a big hub and tomorrow they will also, not in all the cases, book their taxi through Google Maps or through TripAdvisor or through any of the services. Because a taxi is now seen as a commodity, not as a full dedicated service. So, a growing part of this business, maybe one third, will escape to traditional channels of booking.

## **Future business-models**

15. Sooner or later, the anti-competitive regulations that still protect old fashion taxi operators will probably disappear, as they have done in the Netherlands, in Sweden or in New York. The taxi industry will have to adapt to this new landscape.

### **Strengths and weaknesses of the old industry**

16. Strategies to adapt will depend on the strengths and weaknesses of each one, according to the type of company. For this we can use the typology outlined by Schaller [2015, p.12] and presented in Table 1.

17. First come the integrated companies that run their drivers' recruitment and training, their dispatch and record keeping and own the vehicles they maintain. Those companies are not very agile, and not enough focused on the new assets because they are focused on maintaining the vehicles, educating the drivers, and they are also very low skilled about marketing or about networking.

18. In the second category of companies are the booking platform companies or the radio-dispatch companies. They rather run all technologies because they are focused on hardware, on-board hardware in the vehicles and in the telephone call centres. Most of them have very little know-how on marketing or on CRM (Customer Relationship Management) and none on social networks.

19. In the third category are the independent licence owners or the drivers who rent their license and their vehicle. With the new landscape, they are tempted to have not only one supplier of fares, like before, but to work with all the new suppliers.

20. These three characteristics are weaknesses of the old industry. But the old industry also has one important strength, which is the quality control. These old companies succeeded in having a strong relationship with the driver based on trust and are used not only to put in relation the customer and the driver, but also to manage the quality of the whole service.

### **A business model and three (complementary) strategies**

21. What are the options and what are the new business models for a new taxi industry?

22. A first strategy would be for existing companies to focus on their core business and to devolve the rest to dedicated business units. For example, if a company is focused on supplying vehicles to the taxi industry, this is its core business. It just has to manage to buy vehicles and to rent them to taxi drivers. If it is a dispatch company, it would dedicate a business unit or create a subsidiary focused on controlling

the networks and developing new skills about community management, about customer relationship, about digital communication, pricing, yield management, etc. This dedicated unit would not have to manage the staff of the call centre or to cater the on-board equipment.

23. One example is given by G7 in Paris. It has founded dedicated business units or subsidiary companies for each purpose, e.g., Serenis for the call centre, Taxirama for supplying vehicles to the drivers or G7-Booking for online booking.

24. A second and complementary strategy is for several taxi companies in different countries to jointly build some organization with a strong network and a strong brand. Its purpose would be to become a valuable potential partner for Google, or for Amazon, or for TripAdvisor. This organization would then be capable to negotiate with the global network companies to be present in their applications, for example, in Google Map itinerary planning application, or in all the travel agency planning applications, e.g. through Amadeus. However, this entails a high level of coordination between companies in different countries to develop a common brand, i.e. a common name and logo, and possibly a body colour.

25. A third element to this strategy is for this international organization of taxi companies to use a common app with constantly updated services and capabilities, able to compete with the sophisticated apps of the other global Commercial Transport Intermediaries<sup>2</sup> (CTIs). And behind this app, it is important for the common platform to analyse the big data produced for back office research.

### **Business models and access to scarce resources**

26. In every industry, firms compete for what economists call scarce resources, i.e. resources that have a cost. In the taxi business, one can identify four resources: (i) the customer base, (ii) the drivers, (iii) the vehicles and (iv) space.

27. For the purpose of the analysis, the customer base can be segmented in four components: (i) the linked customers, i.e. the ones that are familiar with smartphones, internet, and pay with bank cards, (ii) the disconnected ones, by choice if they do not want to be traced or by constraint if they have no smartphone or bank card, (iii) the tourist unfamiliar with the local services available and (iv) the subsidized customers, i.e. those whose mobility is encouraged by public agencies. In this last segment one finds the disabled, the seated patients, the elderly, the school children, and people for whom providing high capacity scheduled public transport would be too expensive (e.g. in low density areas).

28. As mentioned earlier, drivers are not necessarily a scarce resource, unless taxi companies need trusted drivers or, in the case of subsidized transport, drivers with special training to cater for the disabled or the children or the seated patients.

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<sup>2</sup> “Commercial Transport Intermediary” (CTI) are defined as follows “Digital intermediaries or marketplaces that canvass or solicit for a passenger to connect with a licensed professional driver, meeting the requirements of the relevant jurisdiction and operating a validly registered vehicle under the laws of the relevant jurisdiction.”

29. Vehicles are no longer a scarce resource except if their number is capped for some reason. One reason might be to ration space.
30. Space is definitely a scarce resource in urban areas and in specific places of high demand like airports, train stations, or stadiums after a game. Historically one main reason for capping the supply of cabs was to control congestion in the streets and in public places. More recently, urban congestion linked to the rapid development of the vehicle fleets working with the recent app-based CTIs has been highlighted by the incumbent taxi services in New York, London and Paris as an argument for requesting a moratorium.
31. Depending on the resources available to them, taxi companies will favour different business models.
32. In cities where capping is still considered as the best way to fight congestion<sup>3</sup>, licence owners will keep a comparative advantage vis-à-vis global CTIs: they will enjoy a priority access to airports and train stations as well as a monopoly on the street hailing market. And of course nothing prevents them to also compete in the e-hailing market, provided that in this market they are no longer compelled to use a taximeter with regulated prices. In this setting the “integrated companies” business model will be able to tap on the tech refractory, on the tourists arriving at airports and even on the tech savvy if the companies join an app-based platform. These companies generally also build trust relationships with their drivers; this could be a competitive advantage when bidding for subsidized transport services tenders where trust and reliability are a key criterion.
33. To the opposite, this business model may not survive if cities, in lieu of capping, resort to some type of efficient congestion pricing to mitigate congestion and if airports prefer to auction curb space at the arrival piers instead of granting access to metered taxis only.
34. In this case, the dominant business model might be the one of the global app-based CTI, i.e. the “two-sided market” operator that sells rides to passengers and, at the same time sells passenger-rides to drivers. These firms maximize their total profit, i.e., the interlinked profits from both sides, by adjusting its price levels, but more importantly by adopting a pricing structure that balances the relative demands of both sides.
35. In major cities around the world, tourists constitute a substantial part of the taxi market for two reasons. First, because when they arrive at the airport or at the train station with their luggage, the taxi is by far the most comfortable transport mode. Then, once in the city, tourists may not be familiar to the public transport network and the intricacies of its fare system. The easiest solution is to take a taxi, preferably a taxi you can trust because it is the one proposed by your TripAdvisor app or because it belongs to the same brand you know at home.
36. This gives the global CTIs a competitive advantage that can be even stronger if the airport restricts its access to only two or three taxi brands, selected by some sort of tendering process, as a way to streamline traffic and save parking space.

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<sup>3</sup> Even if it only is an alibi

37. As we mentioned earlier, building an international brand and buying a customer base is a huge investment. Markets whose entry requires a huge investment are prone to natural monopoly or oligopoly. In this business model, as we will explain in the “regulation” section, a common practice for the global CTI is to try to dislodge competitors locally by subsidizing both customers and drivers in one city with the profits they draw from a monopoly position already gained in another city.

38. A global app-based CTI enjoying a monopoly or a duopoly position with the tech savvy customers in a one city, could also tap on, or even capture, the local niche market of the tech refractory by installing ticket machines where customers can book a ride, pay it, even in cash, and get a ticket with a code number they will hand to the driver coming to pick them up.

39. With no other government interventions than the regulations promoting safety, the taxi industry might well become an industry dominated by a few global CTIs, and the prevailing business model, the one of two-sided market global giants.

### **Subsidized transport and business models**

40. In most countries of Europe, to minimize social exclusion, different levels of government, from municipal to national, subsidize demand responsive transportation (DRT) for different target groups, e.g.: the handicapped, the elderly, and even for the residents of low density areas, where scheduled bus transportation would be too expensive to provide because of low demand.

41. As we will see in the “Travel-chains” section, this market will go on expanding, in particular because of an aging population. In most countries, taxis are already very much involved in these subsidized markets, e.g. in France it represents 80 to 90% of the taxis’ turnover outside the major cities, where it is also a place of great profligate waste and mismanagement when it concerns the seated patients.

42. What are the business models of the taxi companies operating in these markets? It depends very much on the way local authorities coordinate among themselves and how they prefer to organize the system and tender it to transport operators.

43. At one extreme is the seated patient system in France. When the patient has a prescription from his doctor, for example for a radio therapy 300 km from his home, he chooses his preferred taxi that will come pick him up, bring him to the hospital, wait (with the taximeter on) until the end of the therapy and bring him back home. This trip will be entirely paid by the *Sécurité sociale* (the national health insurance) according to the taximeter fare at the prevailing rate with an abatement of around 10%. French taxi operators have opposed any attempt of the *Sécurité sociale* to rationalize the system. Such an expensive system favours the small taxi firm next door which business model is that of a single licence owner driving his vehicle.

44. At the other extreme, in terms of value for money or efficiency, are the cases of Sweden and Denmark. In these two countries, the responsibilities for providing subsidized transport are obligations of local bodies only, at the county and municipal levels. In several



counties, the jurisdictions and agencies have been able to agree to pool their needs and create a single authority or organisation in charge of making calls for tender, selecting the carriers, ensuring the logistics system (e.g. planning the route of the assigned vehicle to pickup as many passengers as possible on the way), paying the carriers, and charging the different agencies (e.g. hospitals, schools, municipalities) of the consortium the transportation costs of the people to whom they must provide mobility. In Denmark, this authority is called FlexDanmark and it manages the Flextrafik system, a demand responsive public transport [Cazemier *et al.* 2012].

45. The most interesting part of the system is its tendering process where the transport operators bid a price per minute and advertise a time window during which the vehicle will be available. When it gets a booking for a trip, the software selects the vehicle with the lowest cost. This can be a vehicle from the operator who offered the lowest price per minute, but it can also be the vehicle whose home base is the closest to the starting point of the journey, or even a vehicle already assigned that the change in route will not too much delay the travellers already in the vehicle and will be cheaper than the use of an empty vehicle, coming from farther away or more expensive by the minute.

46. With such a system every bidding firm, whichever its size, can be contracted and get assignments. This allows a wide variety of business models, from the large taxi company with part of its vehicle fleet specially equipped for handling wheelchairs to medium size companies and even to single-car independent taxi driver.

47. A similar system exists in the province of Gelderland in the Netherlands, but in most of the other provinces of the country, what is put for tender is the whole service lumped together from the call centre to the actual transport, with most contracts having a term of 3-5 years. This system favours big businesses: about half of the contracts are won by Connexxion the largest public transport bus company in the Netherlands, which sub-contracted about 60% of it to smaller taxi companies.

48. When subsidized transport services are tendered, traditional taxi companies, big or small, together with their respective business models, probably have a competitive advantage because they can commit themselves in the long-term, may be more reliable and have a better control on quality.

49. However, tendering is not the only way to subsidize transport. Another way is to subsidize the traveller directly as with the London Taxicard scheme that provides subsidised door-to-door journeys in licensed taxis and private hire vehicles for London residents who have serious mobility or visual impairments. Here, if the subsidy is high enough to make it a profitable market, even global app-based CTI might find it worth it to dispatch adapted vehicles and encourage they drivers to buy them or rent them. An example in given by UberASSIST that requires its “top driver-partners” to undergo specific training on the necessary knowledge and safety requirements of people with different needs and can accommodate folding wheelchairs, walkers and scooters, although in most cases UberASSIST vehicles do not have accessible ramps or lifts.

## Conclusion

50. What are the business models of the taxi of the future?

51. As in the past, they will very much depend on the policies local governments will design to ensure mobility and inclusion for their citizens, to allocate public space and to ensure fair competition as a means to get the best mobility for different segments of the market at the least price.

52. The prevailing business-model for the taxi of the future might well be the one recently brought in by the global app-based CTIs. For this business model, the unscheduled door-to-door passenger transport is a two-sided market. Their competitive advantage stems from their ability to adjust prices simultaneously on both sides and from the strong brand-name at the global scale massive venture capital funds have allowed them to build. These strong brands make them an inevitable staple of the services provided by the giants of the networks economy. To be present in these markets, traditional taxi companies must adopt the same business model, building a brand-name for an international consortium of taxi companies using a common app.

53. Another important market in the future will be the subsidized unscheduled door-to-door passenger transport. Since subsidies come from local governments, local taxi firms have a role to play. This is not a two-sided market adjusted in real time. For its most part, it is a contract market tendered for periods ranging from one to several years. In these markets, competitive advantage stems from trust, reliability and capacity to manage a diversified fleet and to optimize routes. Depending on the specificities of the market being tendered, traditional taxi firms with their respective business models will be able to thrive.

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