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Innovation Report

Report on the influence of innovations on professional driving

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The road transport industry is at the centre of an unprecedented momentum by which numerous technological innovations affecting both vehicles and professionals will probably lead to radical change to the way transport services will be carried out in the future. Hence the Future DRV project is intent on providing stakeholders with a clearer view of how the expected changes will – among other aspects – modify the occupational abilities professional drivers will resort to when carrying out their duty in the coming years.

As a part of the Future DRV project initial activities, and in order to acquire a more profound insight on some of the most determining consequences technical innovations will have on the occupation of professional drivers, project partners have set out to determine what precise changes can be stemmed by such innovations within the road transport industry.

This report will describe :

- The methodology through which our assessment has been made
- The nature of the feedback received during our investigations
- The topical results received from relevant stakeholders
- And finally the conclusions that can reasonably be reached by this research.

The methodological approach adopted: surveying Transport industry stakeholders

The objectives of our research have led us to seek the information needed directly with those stakeholders who are deemed to have acquired a hands-on insight on what changes innovative technologies may bring about with regard to occupational abilities. To this extent a questionnaire (see Annex 1 below) has been developed in order for project partners to interview relevant stakeholders in their respective countries.

The questions submitted to stakeholders have been developed so as to acquire a better understanding of :

- Innovations' adoption pace
- Production process or organisational changes
- Driver tasks changes
- Future resulting training needs

For this purpose, a series of complementary questions have been developed so as to target separately:

- Professional drivers
- Transport undertakings (operational managers)
- Truck/trailer or technology/software manufacturers

These questions could be broadly understood, which was deemed a convenient way of limiting the topical scope of expected answers, while leaving enough room for interviewees to express their own vision of expected innovations impact in a “guided” approach. It was therefore not a problem to end up with very different answers to a same question, as what our project was trying to grasp was not a commonly accepted scenario on how innovations will be implemented and their impact, but rather a wide set of indications as to how and when these innovations will shape the performance of road transport driving in the future.

Unfortunately, due to unavailability of the stakeholders or to the competitive sensitiveness of these maters perhaps, project partners have been unable to set up interviews with manufacturers and software developers.

However, partners have indeed implemented interview sessions with other stakeholders, including :

- Professional drivers
- CEOs of a transport undertaking
- A trade union representative
- Transport operations managers
- A fire protection and dangerous goods officer
- A Transport/logistics consultant

A qualitative survey

The number of responses, though quite telling, have unfortunately proven to be insufficient (10 interviews conducted) to allow us to proceed with a quantitative analysis. Our research results are thus to be considered much more qualitative than quantitative.

This however should not necessarily be viewed negatively as the information gathered still fits the purpose of providing useful information with regard to the perception transport industry stakeholders have on the manner in which innovation will affect both the services provided by hauliers and the tasks that will remain under or become the responsibility of professional drivers in the future.

Hence our analysis of the results at hand have allowed us build a topical approach of the perceived consequences the introduction of technological innovation will bear onto the European road transport industry, especially with regard to :

- automation
- platooning
- the loading and unloading of freight
- maintenance
- telematics
- and operational planning

A topical examination of results

Automation

The results of our interviews show that automation is not entirely a prospect of the future, as stakeholders have pointed out the (obvious) fact that partial automation is already in play.

Some professional drivers already enjoy for instance automated parking assistance features available on vehicles, which tends to imply that the lucky drivers of such vehicles may already bear certain skills needed when operating automated vehicles (e.g. readiness to take back control of the vehicle when necessary).

However, when asked when full automation may be available on the market, respondents have given a wide variety of answers, some considering fully automated vehicles (AVs) may become available as soon as 2020, while others – perhaps more cautious- indicate such vehicles may not be available on the market before decades.

This pessimistic view puts the blame on certain factors requiring adaptation, updating and/or adjustments before such market provision can become economically viable. Such factors include :

- The necessary evolution of the applicable regulatory and administrative framework. For instance – even on the grounds of road safety - the entire set of European-stemmed rules on working, driving and resting times cannot remain identical if professional drivers are less likely to drive a fully automated vehicle.
- The readiness of technology : although most media publications seem to want the general public to believe full automation is just around the corner, certain technological improvements need to implemented before it can become a reality in praxis. Certain (fatal) accidents that have occurred during the testing phase of such vehicles have revealed that certain obstacles can simply not be

identified correctly by the vehicle on itself, thus preventing the vehicle from performing avoidance manoeuvres.

- The readiness of adequate IT and road infrastructure. IT technology is paramount to proper and reliable communication between the vehicle and its pilot/driver, with public authorities (police), with customers or with back-office operations management. In this regard, the reliability of 5G technology covering the entire territory (no blind spots) will be of the utmost importance for a reliable provision of automated professional haulage. In the same regard, additional road infrastructure material may become a necessity for automated vehicles to operate safely (connected road signs, dedicated highway lanes, setup of new hubs in the outskirts of large cities etc.)

Respondents seem to also all agree on one unsurprising impact the introduction of AVs will have on the hauliers' workforce : the number of professional driving job positions is very likely to drop substantially. This however no consensus on the proportion by which such a slump may occur. When asked, respondents have provided diverse figures ranging from an expected drop of 50% of the professional driver work force to a reduction of up to 90 %.

Platooning

When questioned on about the feasibility of platooning, the majority of respondents believe it can become a reality in the short-term. But results also show – here again- it becoming a reality is highly dependent on :

- the adaptation of the regulatory framework : an Austrian stakeholder even recalls an experiment by which Berger Logistik had endeavoured to pilot a transnational platooning operation in Austria, Germany and Italy , only to abandon the idea because the combined regulatory provisions of these countries made the operation impossible.
- The creation of new road infrastructures such as waiting lanes on motorways and parking areas)

This uncertainty contrasts with important impacts the interviewed professionals laid out with regard to the introduction of platooning.

Reponses show, platooning will probably have an important impact on:

- production processes: a massive arrival of trucks implies massive logistics operations at the same moment, hence loading and unloading capacities will need to increase drastically

- equipment allocation : terminal logistics stations/terminals will need to be re-located outside cities where enough space is available for platoon-stemmed operations; this should lead to higher investments corresponding to an increase in equipment costs
- on human resources allocation : platooning will lead to a decrease in the need for drivers, to the definition of new working hours for those still filling the occupation, and the drawing of new routes more suitable for massive multiple vehicle transport operations.

Loading/unloading responsibilities

The results of the interviews also show that - in case of full automation especially - loading and unloading of freight operations should not remain under the responsibility of the driver whom by definition in such an example will no longer be on board the truck. This entails such operations would become an integral part of logistics service operations rather than transport operations.

In turn, placing the burden these operations on logistics service providers will require them to accept costly investments, either of hiring the necessary personnel to perform these tasks or –more likely – to invest heavily on equipment enabling automated loading/unloading of freight.

Maintenance operations responsibility

Under the assumption automated vehicle availability is closely linked to the availability of e-trucks, our interviews logically show such vehicles reveal – if any- a quite small need for professional drivers to be in charge of vehicle maintenance, since connected e-trucks are supposed to communicate directly with professional maintenance service providers.

Moreover, some stakeholders argue that in any event maintenance requires too complex abilities to be placed under the responsibility of drivers.

Telematics responsibility and planning

Another topic that was raised during our interviews was that of the improvement of telematics features thanks technological innovation. One would think this could typically be an area where professional drivers could devote some of their time once automation alleviates their need to remain behind the steering wheel.

But, surprisingly or not, the feedback received by stakeholders reveal dealing with telematics may not be an area where today's professional drivers will shift their attention. Some respondents argue the technological improvement of telematics will actually simplify tasks for drivers and even perhaps take away certain tasks from human beings altogether. For instance, some have told project partners there would be very little need for any human to scan documents as such operations will be done automatically.

Moreover, some have expressed serious doubts on the customer relations skills drivers can acquire, perceiving such responsibilities as needing to be bestowed upon other categories of workers. This assumption should however be put into perspective : it is an acceptable belief that such opinions have been expressed under the tacit assumption training provision will stay the same and that the respondents have not taken into consideration the possibility of including customer-relation skills in the training programme developed for drivers in the future.

Another potential shift in driver responsibilities, that of professional drivers becoming in charge of transport operations route planning has also been discarded by our respondents who believe such tasks will likely be handled by computer software in the future

Conclusions : uncertainty vs. opportunity

An evident conclusion one might draw to our findings is that there is substantial level of uncertainty with regard to the circumstances under which technological innovations will affect road transport in the future.

Such uncertainty is obvious with regard to the timeframe under which the changes are expected to be visible in praxis, as there is no consensus as to when we can expect

full automation or platooning to become a reality on European roads, and there no guarantee the awaited regulatory and infrastructural changes will be implemented, nor as to the extent to which the changes will be performed.

Also, even though interviews all point to the need for adaptive change, there is no certainty as to how exactly transport production processes or organisation will evolve, to what extent new equipment will be developed and placed on board vehicles, nor how HR policy will evolve to take into account new occupational contents and fields for today's drivers.

Still on the negative side, the carried out interviews have stumbled against an unforeseen dose of scepticism with regard to the evolution of professional drivers' abilities. If such skepticism is not properly addressed and resolved, such a mind frame may lead to professional driving becoming a poorer qualification.

But amidst all this negativity, it is in itself a direct result of our research to discover that none of the transport industry professionals we have interviewed have mentioned all the expected technological advancements may actually constitute a rare opportunity to enhance the added value of the services provided by hauliers to their customers. As a direct effect of the introduction of innovation is the "spare" time today's professional drivers will be given to be devoted to other new services – hauliers will need to define – customers will benefit from.

More importantly perhaps, these interviews have left project partners with the impression the industry was only trying to adapt to the expected changes as if the industry was oblivious of the fact it could actually steer change rather than merely adapt to it.

In any event, the purpose of Future DRV being to provide stakeholders with results and tools enabling them to prepare to the Future stemmed by technological innovation, the level of uncertainty aforementioned will need to be taken into account when the developing the Future DRV profile, notably by adopting a scenario-led approach.

Annex 1

Complementary questions from the perspective of innovation

Initial research/ Task 1

Prepared by Moncef SEMICHI, AFT (FR)

The following questions have been developed so as to acquire a better understanding of :

- Innovations' adoption pace
- Production process or organisational changes
- Driver tasks changes
- Future resulting training needs

For this purpose, a series of complementary questions have been developed so as to target separately :

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Questions for professional drivers

(1) When do you think you will get to drive a fully automated vehicle ?

(2) Do you see yourself piloting a platoon of trucks in the foreseeable future ?
If so, when ?
How will this expand or reduce your work tasks as a driver in the future (e.g. more deliveries, more handling, longer distances etc.) ?

(3) With the development of automated loading features, do you believe you will continue to ensure as a driver loading/unloading operations yourself ?

(4) If automated loading/unloading features become fully operational, do you see yourself still be held responsible for load security ?
(5) Smart cities are developing an increasing integration of complex routing systems and sometimes new subsequent infrastructures. Do you believe, as a professional driver, reading and complying with such systems will be easy for you, or will it on the contrary require you to undergo further training ?
(6) With technical innovations being gradually integrated into trucks, would you find acceptable to still be responsible for truck maintenance and thus undergo additional training , or would you rather see such tasks fall under the responsibility of technologically specialized personnel other than drivers ?
(7) If offered further training in the use of the related software, do you think you should be given the responsibility to perform the dispatching of freight yourself in the future ?

Questions for transport managers

(1) When do you foresee the arrival of at least partially automated trucks ? …of fully automated trucks ?

(2) Would full automation affect the size of your driving workforce ? To what extent ?

(3) Do you believe platooning will be a direct result of the availability of fully automated trucks, or do you believe certain infrastructure and/or regulatory changes will need to be made before platooning can be viewed as viable and efficient by the industry ?

(4) In your view, would platooning lead to :

- the redefinition of production processes ?

- the re-allocation of production equipment (lorries) ?

- the re-allocation of human resources (drivers) ?

(5) Should the loading and unloading of freight still be placed under the responsibility of the transport segment of the supply chain or should it be placed under the responsibility of warehousing/logistics actors ?

(6) If loading and unloading is no longer the driver's duty in the future, which tasks should however remain performed by the drivers so as to check load security ?

(7) With the development of e-trucks, would you rather have your drivers still be in charge of the truck maintenance - providing extra training in the use of the relevant technology- or would you rather have these tasks outsourced in the future ?

8) With the expected development of telematics, do you foresee increased physical intervention of drivers (e.g. scanning, printing etc.) ?

9) In your opinion, will the development of user-friendly load distribution software lead to organizational changes in transport undertakings where dispatching decisions will be made on the road by drivers rather than in office headquarters ?

Questions for (trailer) manufacturers and (software) developers

(1) When do you foresee the arrival of at least partially automated trucks ? …of fully automated trucks ?

(2) When will platooning of automated trucks be technically and commercially available ?

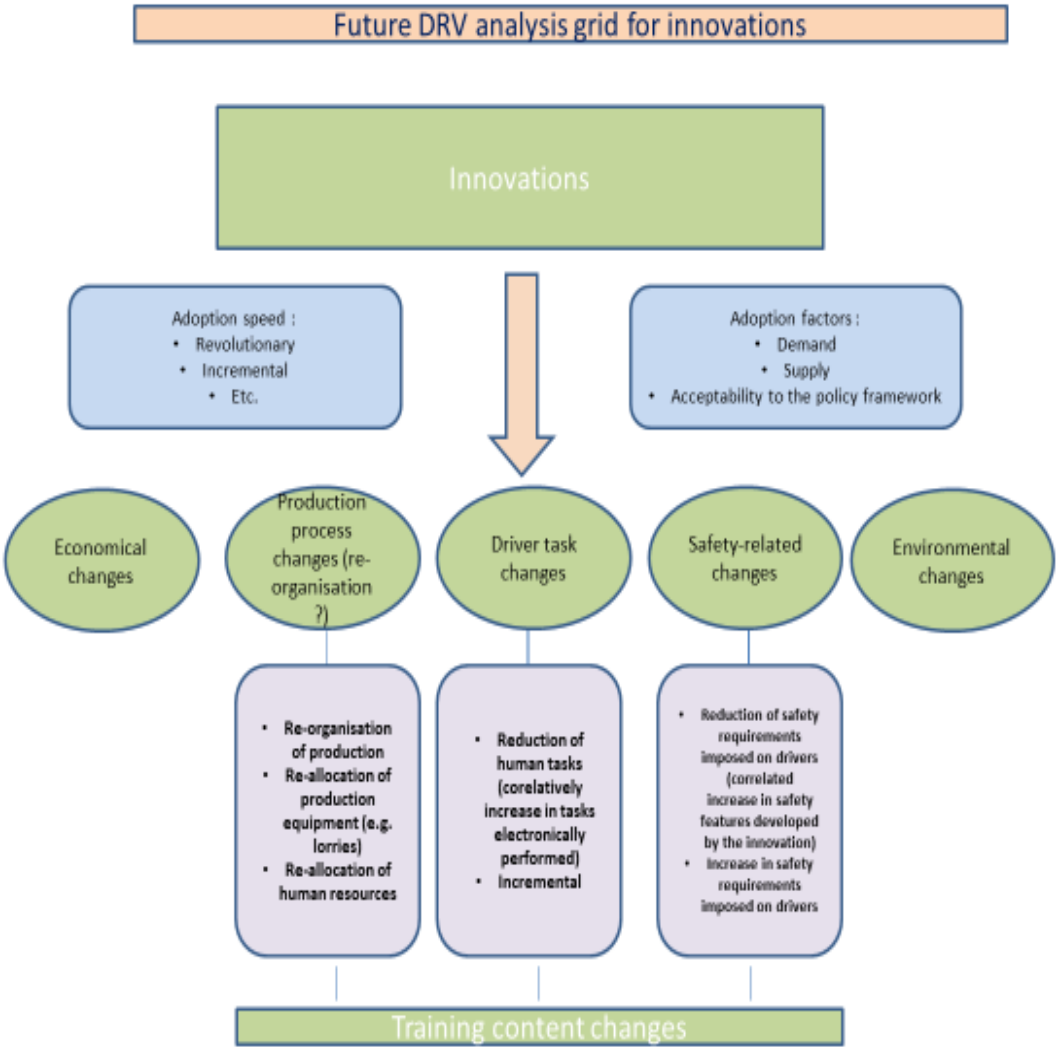
(3) When will a logistics platform be able to implement fully automated loading/unloading operations ? Will the technical innovations allow for automated load security checks ?

(4) With the development of electronically operated and monitored trucks (e-trucks), will the drivers in your view need to undergo special training so as to become able to read vehicle maintenance automated indicators ?

(5) Will maintenance operations be the same as today or will they require additional technology-based skills ?

(6) Will future load distribution software offer decision making tools that require drivers' ability to make decisions themselves or will the software automatically propose optimized dispatching solutions ?

ANNEX 2


Future DRV analysis grid for innovations
Innovations
Adoption speed :
• Revolutionary
• Incremental
• Etc.
Adoption factors :
• Demand
• Supply
• Acceptability to the policy framework
Economical changes
Production process changes (re-organisation ?)
Driver task changes
Safety-related changes
Environmental changes
• Re-organisation of production
• Re-allocation of production equipment (e.g. lorries)
• Re-allocation of human resources
• Reduction of human tasks (corelatively increase in tasks electronically performed)
• Incremental
• Reduction of safety requirements imposed on drivers (correlated increase in safety features developed by the innovation)
• Increase in safety requirements imposed on drivers
Training content changes