

FMS BENEFITS ON REFINERY LOGISTICS

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Abstract:

Fleet Management Systems help companies of different profiles to track and locate any vehicle, as well to gain and manage information covering all relevant events regarding the specific vehicle. This paper will elaborate the consequences of implementing Fleet Management System within one refinery. Considering the functionalities offered by such systems, one will analyse systems' influences over the costs' cutting, increasing the vehicle's safety and creating the more flexible and more robust supply chain. It will also analyse the influence of FMS and implementation of information and GPS/GIS technologies over the complete optimisation of logistic processes and upgrading the complete quality of refinery's business. Driver's attitude toward the implementation of FM systems will also be considered and compared with opinions of sector managers who will be connected to FM system. Results will be used in defining the guidelines which enforcement would provide optimal conditions for qualitative implementation of FM system within a company, or the refinery in this case.

Key words: FMS, refinery logistics operation, supply chain, oil trucks safety

INTRODUCTION

Development of telematics technologies and their implementation enable realisation of innovative solutions within intelligent transportation systems. Main characteristic of such systems which integrate information and communication technology is better adaptation in quickly changeable conditions in traffic, business processes and vehicle itself. Today's market is offering huge number of progressive, flexible telematics systems so that every company can, by careful choosing, find the system that mostly serves its specificities and needs.

According to new researches a successful integration of information technologies (information science and communications) within transportation sector, depends upon adequate strategic planning (so that information systems accomplish transportation system's goals), corresponding organisation of system and its functions (data management, controls, procedures etc.), tracking development of new technologies and optimal human resource management [1].

Positive effects of integrating ICT in traffic and transportation sector are multiple: increased safety in traffic, decrease of incidents, smaller emission of harmful gasses, reductions of fuel costs, maintaining vehicles and accidents' damages, optimizing supply chain, increasing the competitiveness and the company's profit as well.

Corresponding to such systems is also Fleet Management System which helps companies to track and locate any vehicle in order to gain and manage information of all actions relevant to specific vehicle. The system unites Global Positioning System and GPRS data transmissions through modern information technology (Internet, server-client technology, data base) and road vector cartography.

Dynamic settings are receiving an increasing attention in routing problems thanks also to a wider use of communication devices in vehicles equipment. Nowadays, the use of GPS systems allows to central unit to constantly know the location of vehicles and to take dynamic decisions on the basis of the overall situation of vehicles and customers. Such situation evolves during the day and previous plans may be modified because new requests are issued by customers or because some unexpected event took place such as delay due to traffic congestion. [2]

This paper will analyse fields positively influenced by implementation of some Fleet Management System with special emphasis given to prerequisites of successful system's implementation and accomplishing described benefits achieved by the system. In the process especially important is human element, attitudes, knowledge, motivation of all involved in the system starting from fleet manager to driver himself.

For purposes of this research two polls have been undertaken, one among cistern drivers and another among managers of transportation and logistics sectors which have expressed their attitudes and demonstrated their knowledge related to implementation and characteristics of FM System.

REFINERY ENIRONMENT

All companies which own some sort of vehicle fleet to which they perform different operations required in goods' distribution confront the problem of high operation costs, high competition, constant emerge of new regulations which address owner's responsibility, safety of driver and environment etc. Road transportation of oil products has additional component of risk and threatening safety of all traffic participants and environment from the ecological

aspect due to transportation of dangerous, highly flammable goods.

Due to the above mentioned every initiative in the refinery which leads to increased safety of drivers, vehicles and decreased risk of hazard is important. One of such initiatives is surely careful choice and implementation of some FM solutions. In sequence paper provides a description of advantages and benefits given by FM System within a company, with special attention given to the refineries.

MAIN BENEFITS OF FLEET MANAGEMENT SYSTEM

III.1. Transportation in EU

In the EU, road-based goods transportation increased by 37.9% in the period 1995–2005. The change in transportation volumes has closely followed the GDP-gross domestic product According to Eurostat's Panorama of Transport, Edition 2007 [3], the number of vehicles for road-based goods transportation reached 31.5 million in 2004, an increase by 46% relative to 1995.

Closer inspection reveals large regional differences, with the EU-12 Member States showing much faster growth since 2000 in the freight transport sector, compared to the EU-15. Within the European Union, the EU-12 has experienced growth in freight demand over three times that of the EU-15 in the period 1998-2008, and demand within the EU-12 continued to grow in 2008 despite the general downturn [4]. This is mainly a result of these countries starting from a relatively low transport level and then experiencing a shift towards high value production and service industries, which has resulted in strong transport growth. In 2008 for the first time in the 13 years, freight transport demand in the EEA32 experienced a year-on-year decline. However, this is likely to be due to the impact of the economic recession, and will not necessarily continue in the future. Aside from this, the recent trend is for positive coupling between GDP and freight transport demand.

Efficient transportation is becoming more and more important to society. It is not unusual for Transportation costs to account for 20% of the total cost of a product [5]. Furthermore, transportation represents one of the major logistics costs, together with warehousing. Depending on the source, the cost of transportation ranges from approximately 25 percent [6] to more than 50-60 percent of the overall logistics costs [7], [8], [9]).

Economic growth, increasing consumption and globalization tend to increase the need for transportation. Strong competition between transportation providers and between goods owners leads to higher demands for efficiency, customer service, timeliness, reactivity and cost reduction in transportation. The transportation industry and transportation in general face stronger competition. There is a strong pressure towards reducing movement costs, which necessitates more frequent and qualified capacity adjustments. Recently, climate change and other

environmental concerns have become significant drivers towards more efficient transportation. [10]

III.2. IMPLICATIONS ON SAFETY

Modern societies are increasingly confronted with the road traffic externalities, including congestion, accidents, use of energy and emissions. For instance, about 42,500 people are killed and 3,500,000 injured every year due to road traffic crashes in the European Union [11]. In addition, increasing traffic congestion and related environmental stress is expected in the coming decades [12]. Work-related motor vehicle road crashes occur at the workplace and in driving associated with work. Most work-related crashes involve company vehicles. In the United States, Australia and the European Union, work-related crashes contribute about one quarter to over one third of all work-related deaths.

Improving work-related road safety and fleet management would much improve road safety as a whole. Scientific understanding and monitoring of key problem areas, solutions and their effects on road and occupational crash injury, however, is limited and needs to be developed further. [13]

Work-related motor vehicle crashes are a leading cause of death in the workplace in industrialized countries. Professional driving is a highly hazardous activity, involving far higher risks than those encountered in virtually any other occupation or most other activities of daily life. Despite the fact that their rate of death in road crashes is lower than for other groups of road users, professional drivers impose substantial risks on other groups of road users [14].

III.3. REDUCING TRAFFIC CONGESTION

The efficient transport of freight is fundamental for industry and business, and a major factor in the smooth working of the economy. However, the high percentage of freight carried by road in Europe-over 90% in some countries – makes it a major cause, and victim, of traffic congestion. This is compromising the efficiency of transport operations and also has serious implications on safety and the environment due to accidents, vehicle emissions and noise [15].

Fleet Management applications certainly have a positive influence on the efficiency and safety of road freight transport giving in every moment a precise and integral data about overall traffic and vehicle conditions.

III.4. OPTIMIZING SUPPLY CHAIN

The biggest perceived issue in supply chain sector within oil industry is inadequate continuance of timely deliveries to the final oil delivery spots. Considering the changeable oil demand, especially in tourist areas, and

numerous sectors and operations within chain itself, it is obvious that managing the quality of supply chain is extremely complex mission since there are numerous areas that can be optimized. Today there is a huge competition in oil retail so the quality of oil supply and offer intrudes as one of the most important strategies in accomplishing the competitive advantage.

Within present business conditions, important is to define a strategy of making the robust and flexible supply chain without jeopardizing its efficiency. It is also important to analyse and determine areas of "vulnerability" in chain in order to take actions in decreasing a risk of unwanted incidents [16]. Regardless to huge efforts imposed by anticipating the market needs, companies often have to be prepared of unexpected situations and orders. Speed and capability of answering the unexpected order or change within supply chain are considered to be the crucial characteristics of qualitative supply chain.

FM systems enable a constant surveillance over all supply chain's phases and intervention in a real time environment upon all managerial levels. Successful decision making depends upon number and accuracy of required information, detailed description of operations and processes, optimisation mechanisms which all contributes to company's competitive advantage.

Implementation of a dynamic FM system surely positively influences the supply chain's flexibility, speed of answering the orders, higher control of chain operation and finally increased satisfaction of final users [1].

Dynamic FMS has a capability of optimal re-definition of routes in case of any situation that leads to impossible servicing of clients, as originally planned.

III.5. REDUCING VARIOUS LOGISTIC COSTS

Investments made in this system are even more logical when providing huge savings both in material resources and in time. The best way to justify the initial costs of FMS implementation is to quantify all advantages and benefits. In order to completely use FM system and achieve the highest Return-on-Investment (ROI) it is necessary to include an adequate personnel education into the implementation phase and to adopt internal procedure to the system itself [17]. Data [18] indicate costs' reduction of vehicle's suspense due to malfunctions and waiting to repair, 25% lower costs of mechanics and alike, at least 10% lower present price and prolonging the life period of vehicles for 40% due to opportune maintenance.

The next example [19] is efficiency control of employees who use vehicle fleet. Information about the subject were offered by a New York firm specialized in market research called Basex [20] which researches indicated that average worker daily loses more than two hours at work! According to the existing statistics and hourly wages used in calculations it appears that the US itself confronts "waste of time" at 588 billions of dollars per year or 28 billions of unproductive hours per year.

Let us take an example of worker who averagely is daily inactive only 30 minutes. If the same worker has a gross wage of 7.500 Kunas and works 25 days per month, a simple calculation can be made that same worker damages a company for 468.75 Kunas per month. The same calculation indicates that system which controls a working time usage such as FM System pays itself.

Fuel savings: if one observes freight vehicle which daily crosses 600 km and arrives at its destination in planned time then it has executed its mission successfully. However, the speed of driving is also important respectively how much the vehicle "rested" at the proposed route. Namely, there is a difference when vehicle drives at 70 km per hour and arrives to its destination in longer time then when it drives 80 km per hour so it needs less time with longer pause. Time of arrival is the same, whereas consumption is not.

Rough example has been given where the consumption, due to average speed higher then 10 km per hour amounts 12 litres more for the same route. If this repeats daily, the month loss for company amounts app 2,000 Kunas which can, in yearly level, be covered by the insurance policy of the same vehicle. If these variations of the consumption are higher, higher are savings as well [19].

All the above mentioned indicate that any Fleet Management System's implementation brings multiple measurable benefits such as costs' cutting, decreasing the number of accidents, decreasing the harmful gasses emissions and alike, so there should be no doubts about system's implementation into a company regular business.

For maximal usage of any system's functionalities it is necessary to carefully choose some FM products offered in market and to adjust the same to the specific need of a company.

Therefore it is important that responsible managers have knowledge which enables them to choose a system which is the best solution for their company. Besides choosing the appropriate system, maximal efficiency also requires educating all parties about goals that are to be accomplished by system's implementation.

The research will consider driver's attitude toward the implementation of FM systems which will be compared with opinions of sector managers. Research will also indicate a level of managers' knowledge and readiness within FM System.

RESEARCH METODOLOGY

In order to analyze a perception of FM system's implementation importance by the drivers and managers from sector of logistics and transport an empirical research has been conducted. With the questionnaire were examined driver's grades about the safety at present work place, their willingness of additional education, and their general attitude about FM systems and its implementation. For the managers the questionnaires were used to examine their knowledge and preparation in the telematic system's area

and also their attitude towards FM system's implementation. For the research purpose 2 original structured questionnaire were created. 34 drivers (of total 70 that received the questionnaire) answered the 12 questions of various types. Each of the drivers was alone with two examiners while completing the questionnaire. The other questionnaire referenced to the managers and sent by e-mail, contained 13 questions where some of them were equal to those posed to the drivers. Of total 60 e-mails sent, 35 managers fulfilled the questionnaire.

RESEARCH RESULTS

The questionnaires given to managers indicated following results: the majority of respondents belong to the age group 40-60 years (83%) with years of work – standard deviation 12.22, mean value 18.69, median 18 and mode 31. When asked whether their company uses FM system 25% of respondents gave positive, respectively 72% negative answer. Majority of respondents (63.89%) knew even before taking this questionnaire possibilities and functionalities of FM System. In the Table 1 respondents gave following answers to the fifth question regarding a present safety of drivers and vehicles:

5. How would you evaluate, considering the present conditions in your firm, safety of drivers and vehicles?	Non satisfactory	2	5.56%
	Satisfactory	7	19.44%
	Good	11	30.56%
	Very good	13	36.11%
	Excellent	2	5.56%
	No answer	1	2.78%

Table 1 - 5. Question to the managers

The following question in the Table 2 concerned some familiar FM functionalities and later results have been noted:

24 hour info about location and movement of a vehicle	1	0%	Info about vehicle's arrival to targeted locations	1	0%
	2	2.78%		2	0%
	3	2.78%		3	5.56%
	4	55.56%		4	44.44%
	5	36.11%		5	47.22%
	No answer	2.78%		No answer	2.78%
Control	1	0%	Managi	1	5.56%

of finished and unfinished tasks	2	0%	ing the information of all movement details	2	8.33%
	3	11.11%		3	5.56%
	4	58.33%		4	52.78%
	5	27.78%		5	25%
	No answer	2.78%		No answer	2.78%
Ensuring the right usage of vehicle	1	2.78%	Positive influence over driver's behaviour modifications	1	0%
	2	2.78%		2	0%
	3	11.11%		3	25%
	4	55.56%		4	47.22%
	5	25%		5	25%
	No answer	2.78%		No answer	2.78%

Table 2 - managers' answers on 6. question

In question No. 7 managers should have evaluated how much do multiple sensors influence safety of drivers, vehicles and other participants in traffic. Later results have been collected:

I believe this will absolutely not increase the safety	2	5.56%
I believe this won't have greater influence over the safety	3	8.33%
I believe it will increase the safety up to a certain extent	7	19.44%
I believe it will significantly increase the safety of drivers, vehicle and other participants in traffic	23	63.89%
No answer	1	2.78%

Table 3 - managers' answers on 7. question

In another question respondents should have commented influence of FM system over the responsibility and discipline of drivers since dispatchers can instantly identify diversion from defined route, speed excess and unauthorised actions in order to undertake appropriate actions. These are the results:

I consider it positive and necessary when introducing order and increasing the safety	18	50%
I consider it positive but I don't believe it will completely solve described problems	14	38.89%
I consider it won't significantly change bad habits and unauthorised actions	2	5.56%

It will influence very badly on drivers	1	2.78%
No answer	1	2.78%

Table 4 - 8. question for the managers

FM System unites GPS satellite positioning and GPRS technology of data transfer and modern information science technologies (Internet, server-client technology, data bases) and road vector cartography. System offers numerous applications for retail and whole sale that will be used by all involved in the system. Question No 9 posed to managers refers to education organisation. Table 5 contains their answers:

Detailed education is extremely relevant for successful managing the system, and all the involved should participate – from driver to manager	22	61.11%
Education is important only to operators in the central office since they will analyse submitted data	8	22.22%
Skills required for system's usage employees will gain in practice, and no additional education is required	5	13.89%
Every additional education is redundant since FM system is not useful	0	0%
No answer	1	2.78%

Table 5 - 9. question for the managers

Besides some prior described possibilities of FM systems, paper also defines detailed parameters that are observed such as motor's working hours, exceeded mileage, effective work of vehicle's machine, average consumption in 1/100 km or 1/h, work in idle motion, attendance of driver/mechanic, working hours, productivity of vehicle/driver, speed excess and number of strokes, position of vehicle's movement on the map, service reminders, monitoring the fleets' costs etc.)

Considering all the above mentioned FM system's characteristics, in the question No 10 managers were asked to evaluate the consequences of FM system's implementation in their company (1-completely irrelevant, 2-irrelevant, 3-nor relevant or irrelevant, 4-relevant and 5-extremely relevant):

It increases the safety of vehicles, drivers and other	1	0%	It increases the safety of performing all operations	1	0%
	2	2.78%		2	5.56%
	3	22.22%		3	13.89%
	4	47.22%		4	52.78%

participants in traffic	5	25%	not relevant to loading and unloading	5	25%
	No answer	2.78%		No answer	2.78%
It prevents stealing the vehicles and goods	1	0%	It decreases the fuel consumption	1	0%
	2	0%		2	0%
	3	16.67%		3	16.67%
	4	36.11%		4	58.33%
	5	44.44%		5	19.44%
	No answer	2.78%		No answer	5.56%
Vehicles are optimally preserved	1	0%	It decreases the vehicles' exploitation	1	0%
	2	0%		2	0%
	3	61.11%		3	25%
	4	11.11%		4	55.56%
	5	25%		5	16.67%
	No answer	2.78%		No answer	2.78%
Optimal routing in a real time environment	1	0%	Decrease of harmful gases emission	1	0%
	2	0%		2	2.78%
	3	11.11%		3	25%
	4	44.44%		4	30.56%
	5	41.67%		5	38.89%
	No answer	2.78%		No answer	2.78%

Table 6 - managers' evaluation of FM implementation consequences

Question No 11 should have analysed how much managers are informed about FM System's price. 86% doesn't know the exact price (55.56% doesn't know approximate price, while 30.56% have some information about it), while 11.11% claim they know exact price of FM System's implementation. When asked what are the reasons company still hasn't introduced FM System the respondents said:

I don't believe our company requires one	1	3.03%
It is useful but we haven't still planned its implementation	13	39.39%
I consider it too expensive	14	12.12%
There are numerous more clever ways for optimal exploitation of vehicle fleet	2	6.06%
Others	12	36.36%
No answer	1	3.03%

Table 7 - answers on the 12. question for the managers

Question No 13 was an open-type question where respondents could have written a comment about subject related to the research.

In extension the results of questionnaires given to drivers are analysed. The first 6 questions were identical to those given to managers. Five respondents match age 35-34, another five 35-39, thirteen 40-49, ten 50-59 and one respondent is older than 60. Age of work indicates following: standard deviation 11.4, mean value 15.88, median 13.5 and mode 5. When asked whether in their company FM System has been implemented, 27 respondents gave negative and 7 gave positive answers. Before taking this questionnaire 21 respondents haven't heard of FM system, while 13 have. Table provides answers to question about safety of drivers and vehicles in the company:

5. How would you evaluate, considering the present conditions in your firm, safety of drivers and vehicles?	Non satisfactory	5	14.71%
	Satisfactory	6	17.65%
	Good	9	26.47%
	Very good	8	23.53%
	Excellent	6	17.65%
	No answer	0	0%

Table 8 - 5. question for the drivers regarding their safety

In question No 6 drivers evaluated some familiar FM system's functionalities. Obtained results are given in table below:

24 hour info about location	1	35.29%	Info about vehicle's	1	20.59%
	2	11.76%		2	17.65%

and movement of vehicle	3	20.59%	arrival to targeted locations	3	14.71%
	4	26.47%		4	32.35%
	5	5.88%		5	14.71%
Control of executed and unfinished tasks	1	26.47%	Managing the information of all movement details	1	26.47%
	2	20.59%		2	29.41%
	3	14.71%		3	5.88%
	4	26.47%		4	20.59%
	5	11.76%		5	17.65%
Ensuring the right usage of vehicle	1	29.41%	Positive influence over driver's behaviour change	1	29.41%
	2	20.59%		2	26.47%
	3	11.76%		3	17.65%
	4	26.47%		4	17.65%
	5	11.76%		5	8.82%

Table 9 - answers on the 6. question for the drivers

In question No 7 drivers should have expressed their attitudes about the influence of various integrated sensors over the safety of drivers, vehicles and other participants in traffic. Following results have been given:

I believe this will absolutely not increase the safety	17	50.00%
I believe this won't have greater influence over the safety	8	23.53%
I believe it will increase the safety up to a certain extent	9	26.47%
I believe it will significantly increase the safety of drivers, vehicle and other participants in traffic	0	0%

Table 10 - answers on the 7. question for the drivers

In another question respondents should comment influence of FM System over the responsibility and discipline of drivers since dispatchers can instantly identify diversion from defined route, speed excess and unauthorised actions in order to undertake appropriate actions. These are the results:

consider it positive and necessary when introducing the order and increasing the safety	6	17,65%
It certainly influences order and safety but disturbs my privacy	7	20,59%
It causes a sense of unease and lack of trust	16	47,06%
I consider it extremely negative since it insults me as an employee	5	14,71%

Table 11 - drivers' answers on the 8. question

Question No 9 refers to the education, with only difference that drivers should have described their readiness for training in phase of FM System's implementation. Answers are given in table:

I am aware that trainings are essential for successful implementation so I am willing to participate	14	41,18%
I believe I don't require any additional education since I manage all relevant technologies	5	14,71%
I believe no one requires a formal education since required knowledge will be gained in practice	12	35,29%
I refuse any additional education since I believe nothing should be introduced or modified	3	8,82%

Table 12 - drivers' answers on the 9. question regarding education

In question No 10 drivers were asked, as managers were, to evaluate with grades given from 1 – 5 the consequences of implementing FM System within a company. Their answers are following:

It increases the safety of vehicles, drivers and other participants in traffic	1	29,41%	It increases the safety of performing all operations relevant to loading and unloading	1	29,41%
	2	26,47%		2	23,53%
	3	11,76%		3	8,82%
	4	17,65%		4	26,47%
	5	14,71%		5	11,76%
It prevents stealing the vehicles and goods	1	14,71%	It decreases the fuel consumption	1	23,53%
	2	17,65%		2	32,35%
	3	14,71%		3	8,82%
	4	26,47%		4	20,59%
	5	26,47%		5	14,71%
Vehicles are optimally preserved	1	26,47%	It decreases the vehicles' exploitation	1	29,41%
	2	32,35%		2	26,47%
	3	5,88%		3	14,71%

	4	20,59%		4	23,53%
	5	14,71%		5	5,88%
	1	17,65%		1	23,53%
	2	23,53%		2	26,47%
	3	20,59%		3	20,59%
Optimal routing in a real time environment	4	20,59%	Decrease of harmful gases emission	4	11,76%
	5	17,65%		5	17,65%

Table 13 - drivers' answers on FM implementation consequences

In question No 11 drivers were asked to describe how FM System's implementation would influence them in everyday work. Here are the results:

Extremely negative, I believe it would harm my privacy	13	38,24%
I don't know	9	26,47%
I doubt the present condition can be improved by FM system's implementation	7	20,59%
Positive	5	14,71%
Extremely positive in every manner	0	0%

Table 14 - drivers attitude toward FMS implementation

In question No 12 drivers could have made a comment about research subject.

DISCUSSION AND CONCLUSIONS

When analysing results given by managers it can be concluded that 25% answered their companies have implemented FM System, though it concerns refinery which still hasn't implemented the system. Managers' disinformation about such an important matter can eventually be excused by the fact the refinery in question will soon implement such a system. Even 33% of managers-respondents haven't heard of FM System and its functionalities before taking this questionnaire, which implies insufficient knowledge within responsible employees related to gaining different benefits in a company by means of new technologies. Considering drivers, 62% of them haven't heard of the system before this questionnaire while the rest has, and the same ignorance could have influenced a restrained to negative attitude of drivers toward FM systems. In the fifth question, where both groups of respondents had to evaluate existing safety of drivers and vehicles, given answers don't differ between two groups but are very divided within groups themselves that indicates extremely different perception of safety in the responding groups. Differences in answers can be noticed in question No 6 where respondents evaluated

some standard FM system's functionalities. Almost all functionalities – more than 50% were graded with marks 1 and 2, respectively as totally irrelevant or irrelevant. All these functionalities, 70-80% managers evaluated with marks 4 and 5, respectively as relevant and extremely relevant.

Answers given to question No 7 are significantly different: even 64% of managers consider implementation of various sensors and alarms in vehicle will seriously increase safety of vehicles, drivers and other participants in traffic, while the same answer provided 0% of drivers! Even 50% of drivers and only 5% of managers believe this will not at all increase safety of neither vehicles nor drivers.

Eighth question didn't have a completely identical answers offered to drivers and managers, but the purpose was to analyse opinions of both groups about making the order by implementing FM System, 24 hour surveillance of vehicles and drivers and preventing the illegal actions. 50% of managers consider it positive and necessary while the same opinion shares 18% of drivers. 39% of managers consider it positive but don't believe it will solve all problems, while only small percentage (8%) believe it will not change bad habits of drivers, but instead it will badly influence them. Even 82% of drivers feel their privacy to be threaten, they feel uncomfortable and disbelief (21% considers system to be positive but threatens their privacy, 47% feel uncomfortable and 15% claims it to be extremely negative and insulting for them, as employees).

Question No 9 involves education: 61% of managers recognize importance of education for all included in FM System, 22% believes only operators in the central office should be educated while 14% believes required knowledge will be gained in practice. Drivers (41%) believe they need an education and are willing to participate in one, while 9% refuse any additional education since they believe nothing in the company should be changed or introduced!

Answers given to question No 10 where respondents had to evaluate consequences of FM System's implementation one can also notice differences in answers given by drivers and managers: while managers haven't grade any characteristics with marks 1 or 2, approximately 50% of drivers grade all FM System's characteristics with marks 1 and 2 which again implied their scepticism and disbelief towards FM System. Managers' answers to question No 11 imply the great majority doesn't know the costs of FM System's implementation respectively they cannot evaluate the cost effectiveness of the investment which causes the sluggishness towards FM System.

Answers to question No 11 addressed to drivers in order to describe how FM System will influence them, almost 40% of drivers believe the influence will be extremely negative with huge violation of their privacy, while only 15% believe in positive influence.

Analysed data imply several conclusions: drivers consider FM System primarily as violation of their privacy by ignoring proved positive effects of the system. Their

comments, expressed in the 12th question about the negative experiences of their colleagues who work in companies that have already implemented the system and possible negative effects that could also be imposed to them. Therefore it was extremely important to define protocols and internal rules before the system's operative implementation since they will, regardless to 24 hour monitor and surveillance, insure necessary level of privacy to drivers. Also, besides detailed technical education, drivers should be informed about system's functionalities so to perceive how their safety will indeed be increased, company will make multiple benefits out of system so finally, advantages will be provided to all included. Drivers believe they don't require any training which is connected to their disinformation about the system's complexity and strong scepticism towards the system. Therefore, it is necessary by transparent informing of superiors about FM System's implementation goals to motivate drivers and others included into education so to avoid fatal mistakes due to ignorance.

Managers' answers show that despite their positive attitudes towards the system, the majority isn't qualitatively introduced to it though the system itself decreases different logistic costs, increases business performances and other benefits prior described in paper. Managers should analyse in detail the wide offer of telematics applications on the market so to discover one that is the most suitable to company's specificities, according to its basic and optional functionalities and price. Hence, FM System's positive effects in a company are unquestionable, though they will fail if the human element is neglected. It is also important to emphasize how driver's behaviour in a vehicle is directly connected to his and other people's safety so motivated and satisfied driver presents less danger in traffic.

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