

# Results of smart factories success

[Business](#), [Manufacturing](#)



During this phase of the research result important to study at which stage is the automotive sector and future perspectives with the adoption of smart factories. Focusing on the number and percentages of new smart factories and in particular the impact of these on expected productivity gain, reduced operational costs, operating profit and operating margin.

The analysis conducted by Capgemini Digital Transformation Institute in march of this year gives principally one main result, that consists on the possibility to generate an added value of 160 billion dollars in productivity improvements to the entire automotive sector, starting from 2023. The entire sector has great expectations on smart factories, in fact the starting point is that there will be an improvement of productivity capabilities around 30 percent from the beginning of the year 2023. In addition, automotive sector forecast to realize a plan that permits to have 24 percent of smart factories of all existent production plants. The result of this reasoning is the generation of 160 billion dollars of value added that can be translated in 7% of the total value created by the sector each year. However, there are some researchers, who imagine a more positive scenario based on the possibility to realize by 2023 a number of smart factories equal to the half of all manufacturing plants. In this case, numbers related to value added created will be totally different, 344 billion dollars traduced in fifteen percent of the value created in automotive sector last year.

Now, we are going to look at the impact of smart factories on financial performances of automotive companies. From the table below is possible to see important results in terms of augmented productivity and operating profit results. This, can be considered the basis in order to reach the state of

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equilibrium between initial expenditures and generated incomes through smart factories. The final aim is to reach this state in less than a year from the complete realization and exploitation of smart factory.

As we have said before the sample of the research is divided in two big families, automotive original equipment manufacturer and automotive supplier. Companies of both families represent the best in the market, in fact they are in the top ten category in terms of annual turnover. Starting from OEMs, we can see from statistics of last year that the sector is able to produce 158 billion dollars of revenues, which can be translated in 6% of operating margin that come from what is considered the core business of companies. As we can see from the table below, researchers will expect an adoption rate of smart factories up to 2023 equal to 24 percent of all existing factory plant. Starting from this assumption, and from the fact that both OEMs and automotive supplier will improve their productivity efficiency about 30% compared to the actual level. Result possible to see an improvement in the level of operating profits for OEMs equal to 50% an amount of 4.6 billion dollars over the actual level of 9.6 billion dollars.

At the same time automotive supplier will experience a rise of operating profit equal to 1 billion dollars, that can be traduced in 38% over the current level. In addition to those results is possible to adjust all we have said with another improvement in terms of cost savings of an amount around 0.5% and 7%. Those costs reduction come from a better management of operational costs related to the production process. Data and information voiced above can be derived from a realistic point of view. But, the research

estimate and suggest also another possible case that can be considered optimistic, a scenario where all possible conditions will be satisfied. In fact, OEMs will be able to reach an operating profits of 10 billion dollars over the current level equal to a gain of 110%. At the same time automotive supplier is able to lead its operating profits to 3.6 billion dollars, which is equal to 85% over the current level.

Starting from the Capgemini research we can conclude that smart factories are profitable in terms of productivity, cost savings and profitability. Now the objective of the study is to estimate if smart factories are sustainable in the long and medium terms calculating the time needed to reach the break-even equilibrium in terms of expenditures and income in order to realize smart factories for both OEMs and automotive suppliers. Capgemini's research achieved to the idea that break-even is possible to reach in one year at the moment that smart factory is totally implemented and exploited, but before reaching these conclusions I will give some number about it. Starting from the case of a general OEM that belongs to the best company category, usually it has around the world at least 30 factories. Before, we have said that the adoption of smart factories in 2023 will be 24%, at this stage result possible to understand that a typical OEM will have 8 smart factories around the world that can be divided in three green-field and five brown-field.

The starting point of the research is to calculate the amount of investment needed to realize a smart factory, taking in consideration the digital components that have to be acquired the spending level will be around 20-37 million dollars. Therefore, in case of green-field smart factory the figure

below shows an amount of investments among 3-4 billion dollars. Thus the last number can be considered as the pillar for calculating the break-even point. In fact, in the table above we have seen that when smart factory reach its full potential is able to generate 4.6 billion dollars of operating margin over the normal exercise. This leads to the conclusion that, when a smart factory is totally completed and exploited is able to reward investments done in less than one year, 9-11 months. Taking in consideration a general automotive supplier is possible to develop a similar analysis. In fact, the approximate number of factories owned by a global top ten automotive supplier at present is around 200.

We know from the table above that the expected share of smart factories by 2023 are around 50 the 24% of actual factories. Taken this expected 50 smart factories 10 will be greenfield smart factories with a set up cost around 500-700 millions dollar, while 40 will be brownfield smart factories with set up cost around 40-80 millions dollars. Figure 6 Break-even point for OEM smart factory (Capgemini Digital Transformation Institute, 2018, pp 1-36). Finally, we can summarize a total cost for a top ten automotive supplier around 540-780 millions dollars. After attaining the full potential with 1 billion dollars of extra annual profit as estimated in the scenario above the firm can be able to reach the break-even point in 7-9 months.