Industry 4.0: Impact on both development and product

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ITALY

1. Chapter 1 (Introduction)

What does Industry 4.0 mean for SDF Group? We don't have to speak only about Industry 4.0, but about 4.0. For SDF 4.0 means Industry but also Agriculture 4.0

2. Chapter 2 (How does Industry 4.0 change the development of the projects?)

Industry 4.0 has an impact not only on the process, but also on the development of the product.

We went from drawing made by hands to what today is called Digital Communication through CAD 2D and 3D, Virtual prototype and Virtual Reality (**Fig.1**). By Digital Communication, the engineers can have access to a really high quantity of data. Today the engineers can use some technologies like 3D printing or Virtual reality, but what can be the common area among Agriculture, Industry and Development? (**Fig.2**)

3. Chapter 3 (Key points of 4.0 - IoT)

The key points of 4.0 are:

- Sensors: we are talking about the new sensor generation always connected and able to send information about the status of the components
- Connectivity: by the new high speed connectivity we can have the possibility to connect and to be connected everywhere and continuously
- Big data: High quantity of data with fast and easy access

At the end we are talking about Iot, Internet of Things. What does IoT mean for the Development and Agriculture? The answer is:

- Digital communication and Cloud of data in order to be able to have very fast access to Big Data, continuous interaction between engineer and product and to know the situation of the product at any moment
- Possibility to reduce the Time to Market
- New features of PLM system. Today with PLM system we manage the info about design, development and industrialization. With IoT it is possible to monitor the complete Lifecycle of the product and to make available also this Info.

4. Chapter 4 (Predictive maintenance)

Using all these key points, it is possible to achieve an important topic like Predictive Maintenance. By using new products generation, we can always be connected and check the conditions of the parts. When an imminent failure is detected, Service is alerted and the part could be automatically

ordered to Spare Parts. This is a good example of interaction among Sensors, Connectivity and Data. To reach Predictive Maintenance can be very important: it is possible to reduce costs and risks. To be able to understand when a component is near to the failure and to change it before the final failure can reduce not only the costs of the repair, but above all can increase the safety of the operators. (**Fig.3**)

5. Conclusion

At the end, we can conclude that the main impact of 4.0 on the development is the high quantity of data that engineers can have and the possibility to monitor the product during its entire life cycle. This allows engineers have many more data that can be useful to develop the product of the future. Seen all this, how will agriculture change accordingly? The farm of the future will be connected and smart (**Fig.4**). All the elements of the farm will be easily connected among them and the farmer will have all aspects of his farm under control and can intervene before a fatal failure occurs.

References

[1] **Di Daniele Cerri, Laura Cattaneo, Sergio Terzi**, 2017. Industria 4.0: una rivoluzione anche nella progettazione

FIGURES

Figure 1 - Change of the product development. *Suorce: [1]*

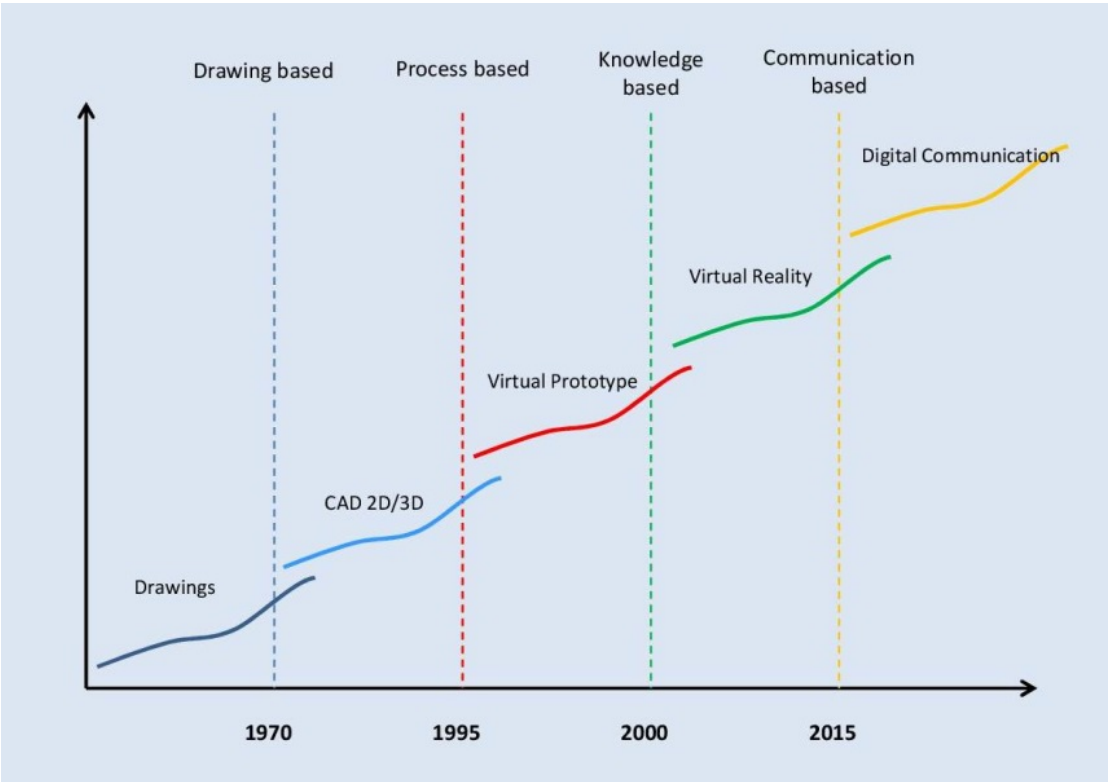

Figure 2 - Agriculture – Industry - Development

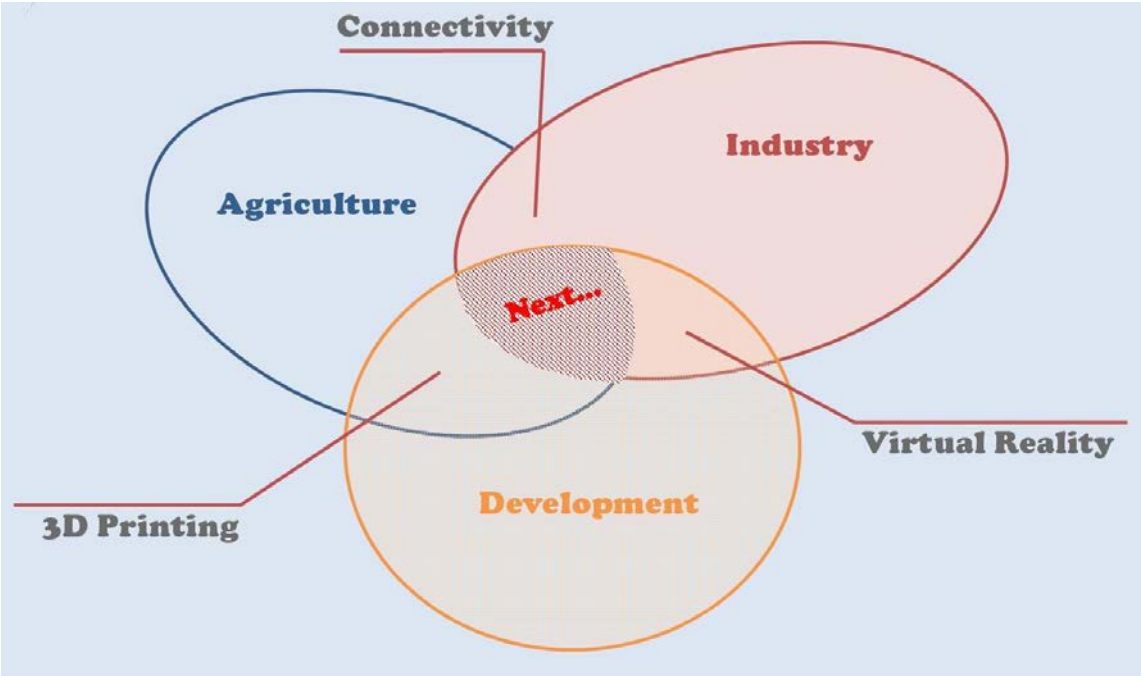

Figure 3 - Cost/Risk of the failure

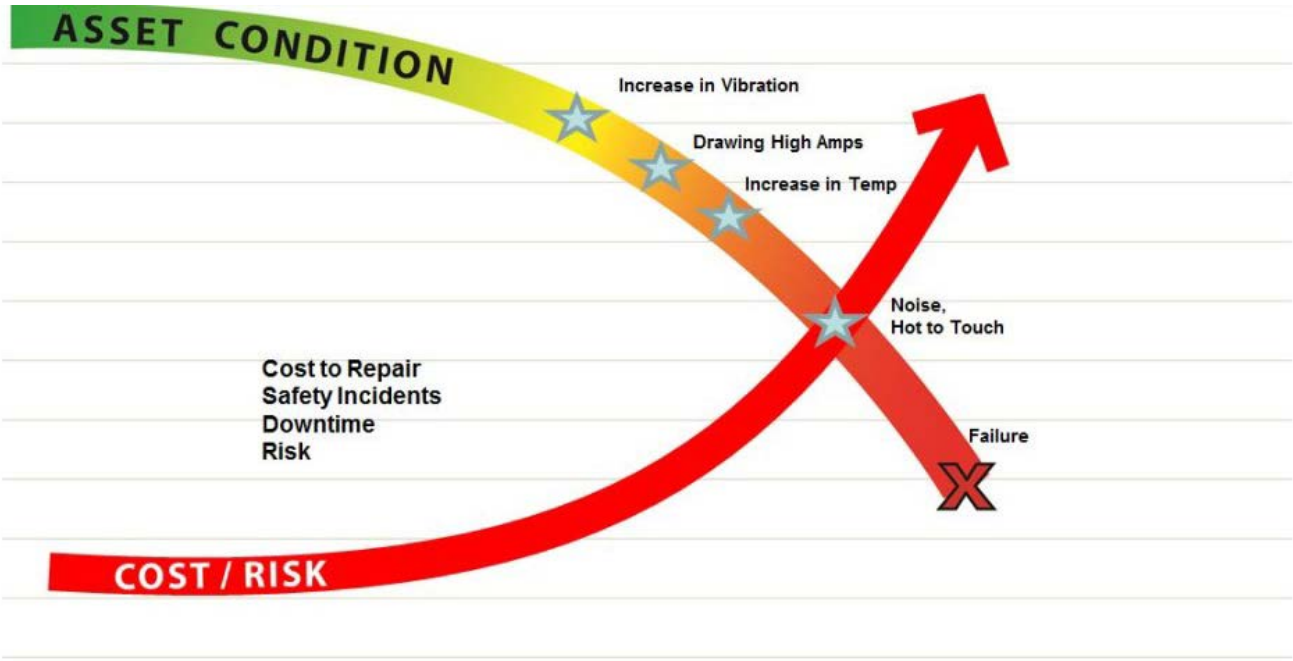

Figure 4 - Future farms