

Case Design Sheet



1. CASE DESCRIPTION

Systems for the complete traceability of assembled components and a guided pipeline in assembly operations.

PARTNER
AFIL

LOCATION
Italy, Lombardy

TIME/DURATION
Solution Implemented

2. DIGITAL TRANSFORMATION CHALLENGE

2.1. BUSINESS TRANSFORMATION

Industry: Machinery

Company B is a SMEs operating in the manufacturing industry, in particular in the machinery sector. Company B has an expertise in the field of mechatronics and is active in the design and realization of solutions for the automatization of the assembling and testing process of several products. The assembling and testing solutions can be either semi – automated as well as fully – automated. The solutions are provided to the customer and placed in the production process line.

2.2. CONCEPTUAL TRANSFORMATION

Coherently with the depicted situation, Company B has realized a solution for a customer to improve the assembling process of a particular product. Indeed – at the starting point – each component of the product was mainly assembled manually without an assisted guide. In addition, the traceability of the various assembling phases was not allowed.

As a result, Company B has set the target to realize a system to guarantee the complete traceability of the assembled components as well as assist the operators during those phases of the process that are not fully automated

2.2. TECHNICAL TRANSFORMATION

In line with the conceptual transformation, Company B has decided to combine in the solution a set of technologies to allow either the complete traceability of the assembled components as well as to guide the operators during the semi – automated activities. The final goal was to improve the flexibility and the global efficiency of the production process.

Company B has thus realized a mechatronic solution able to track the assembling of the components through a barcode. Further, the mechatronic solution was able to store each activity carried out by the operator. In

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order to assist the operator during the semi – automated activities, Company B has introduced a set of dedicated panels along the workstations in order to display each activity phase by phase. As a result, the operator has been guided during the production process.

3. SOLUTION

As previously indicated, in order to guarantee the complete traceability of the assembled components, Company B has proposed a mechatronic system for the assembling and testing of products.

From a technological perspective, Company B has thus realized a mechatronic system equipped with a barcode label. As a result, each operation performed on the system has been tracked and stored phase by phase including any threshold values recorded during the testing phase.

To assist and guide the operators during the semi – automated activities a set of panels have been provide alongside the manual stations. In this way it was possible to show to the operator – step by step – the tasks and the actions that must be executed.

The barcode system allows to inhibit a operations if the previous one is not completed. If a part is recognized as scrap, the object is coded with a label in which the type of scrap is recorded. The possibility of a re-manufacturing activity is then evaluated.

To guarantee flexibility, the system has been designed considering the interchangeability among the equipment. In the detail, all the equipment was coded. As a result, the system was able to recognize the type of equipment installed as well as to check if the equipment fit with the product to be realized.

Lastly, the whole system has been interconnected. All the workstations are managed by a central PC in order to improve the efficiency of the production process. The workstations have been also equipped with a set of specific software packages designed to provide useful information e.g., the visualization of production data, the display of alarms, indications for a guided change production and statistical analysis.

4. KEY SKILLS AND COMPETENCES

The implementation of the solution has required a set of key skills and competences. Key skills and competences required have been:

- Production Management
- Production Planning
- Data Analysis
- Specific competences related to the introduced technologies

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5. RESULTS

Company B has designed a system able to perform the full traceability of the assembled components as well able to support the operator during the semi – automatic assembling tasks. The implemented solution has allowed to enhance the flexibility of the production process and to reduce the set-up time. Moreover, the set-up process has been made easier allowing each operator to directly perform in line the changing of the equipment.

6. CONCLUSIONS AND RECOMMENDATIONS

To conclude, the proposed industrial case has shown how the overall efficiency of a production process and the reduction of scraps can be improved by the application of the innovative 4.0 technologies. In particular – in the proposed case – the full traceability of the assembled components has been achieved through a mechatronic system equipped with a barcode able to track the assembling of the components during the production process.

Lastly, it was possible to design a system able to consider the aspects concerning the versatility and the reconfigurability for the manufacturing of different products reducing the set – up time. Finally, the solution has allowed to improve the safety of the operators during the tasks.

7. REFERENCES

8. APPENDICES

No appendix