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Case Series

The role of the ERP system in the rapid increase of production

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Abstract

ERP systems can play a crucial role in the company's ability to adapt to new situations and unexpected changes. This paper deals with the example of a company that unexpectedly, after several years of stagnation, got the opportunity to double its production. The main challenge was not only the increase in production but also the additional requirements for the traceability of individual packages of raw materials and individual packages of finished products. An additional request was a completely different method of product costing and production order settlement than previously used.

The management reacted quickly and took all the necessary steps to adjust the existing production lines and the existing ERP system to the new requirements. While local managers took care of the adjustment of production lines, an experienced SAP consultant was hired to work on the necessary adjustments to the ERP system and design the interface with external systems. He took over all communication with developers of external systems. A central project team was formed, which decided on the way in which the change of all parts of the ERP system will take place, primarily in terms of the time planning of the necessary actions. The plan was completely successful. In just 5 months, the production lines were technically adjusted and prepared for the new production method. At the same time, the ERP system was completely revised and supplemented with requested new functionalities, including the creation of all necessary interfaces with external systems for scanning individual packages. The management's final assessment is that this would not have been possible without first having a fast and robust ERP system.

Introduction

A European manufacturing company (hereinafter: the Company) implemented the SAP ERP system in 2004. After that, only minor upgrades were made to the implemented SAP system, due to changes in business or state regulations, and technical updates in accordance with the instructions of the software manufacturer.

Due to various economic factors, the amount of production continuously decreased over the years, and the plan for 2019 fell to approximately 50% of the production that took place at the time of the introduction of the SAP ERP system, in 2004. The number of permanent employees has also been successively reduced every year, and only the production equipment has remained at the same capacity as it was in 2004. The sustainability of the Company's existence is seriously questioned.

In the summer of 2019, just before the start of the new production season, an incredible business opportunity appeared. A large global corporation (hereinafter: the Customer) approached to Company with a proposal for multi-year business cooperation. The Company should make service production for the Customer, but with a start "within the immediate term". On the one hand, this was an excellent opportunity, but on the other hand, this was a great challenge to implement all business preparations in an unrealistically short period of time, without significantly increasing the current number of people [1-5].

Main challenges

There were five big challenges, observed by the Company Management team.

The first challenge was that the quantity of required service production for the Customer is even a little bit higher than the

total planned production quantity for the upcoming season. In other words, production should be raised to more than double the level planned for the next time period.

The second challenge was that the goods receipt of the Customer's raw materials must begin in less than a month from the moment of the first conversation about possible business cooperation.

The third challenge was that the required logistics business process is similar to the existing one, but not completely: The customer is looking for a higher level of material traceability than the one currently existing in the Company. Raw materials will be received in packaging units and each unit should be scanned. Each packaging unit should have its full history in the ERP system. Finished products should be delivered in predefined packaging units and each unit should be scanned for each goods movement, enabling the ERP system to have a full history of each packaging unit delivered to the Customer.

The fourth challenge was that the financial process should be completely new. For service production (raw materials and products are always owned by the Customer) completely different financial rules are valid in comparison with standard products based on their own raw material.

The fifth challenge was that storage space and working personnel are capacitated for the current level of production; certainly not for double the amount of input raw material.

Action steps implemented

As a first step performed by the Management team was the creation of a project team and the urgent engagement of an expert ERP consultant, and specialist for Production Planning, Material Traceability, and Product Costing. They together created the basic action plan in all the necessary areas (IT, ERP, Logistics, Production, Finance, LEX). ERP consultant had a task to manage all ERP and IT preparatory activities (five months full-time). Of course, several other consultants for occasional activities were engaged later.

After that, one new person (master's degree in economics, without previous work experience) was employed by emergency procedure, for the purposes of defining and monitoring logistics processes within the ERP system. The person was fully committed to working with the ERP consultant, so he received the best possible training in a short time.

What is also important for readers to have the full picture of urgency, is the fact that all preparatory actions were started "immediately", without waiting for the final signature of the contract with the Customer. The project team then started to speak with the Customer about all the logistics steps that needed to be precisely agreed upon and adopted:

- The exact date of the first receipt of the Customer's raw materials
- The approximate date of start of service production
- The approximate date of the first delivery of finished goods to the Customer

Having these dates in mind, it was possible to organize the main implementation activities. Seven main processes were defined, from receiving raw materials to invoicing of provided services:

- Receiving of raw materials from customer (by scanning the ID of each packaging unit)
- Transfer of raw materials from one warehouse to another (by scanning the ID of each packaging unit)
- Consumption of raw materials to production order (by scanning the ID of each packaging unit)
- Production and packaging of finished goods (by scanning the ID of each packaging unit)
- Transfer of finished goods from one warehouse to another (by scanning the ID of each packaging unit)
- Shipping of finished goods to the customer (by scanning the ID of each packaging unit)
- Invoicing of provided services (raw materials processing)

A simplified view of the complete business process is given in Figure 1.

In order to develop and implement the required solution, ERP Consultant proposed using the incremental work model, which should start with the creation of a general concept and be followed by the implementation of four separate increments:

- Receipt of raw materials from the customer in the warehouse
- Transfer of materials from one warehouse to another
- Raw materials processing and production of finished goods
- Finished goods delivery.

Each increment should end with the delivery of a usable application built into the external scanning system and fully integrated with the existing ERP system. In order to be sure that all requirements are fulfilled, each increment was organized in the same combination of six steps Figure 2.

- Concept creation
- Programming of external application for scanning of individual boxes
- ERP preparation (Customizing and Interface preparation)
- Testing (Functional testing, Integrative testing, User testing)
- User education
- Go-Live

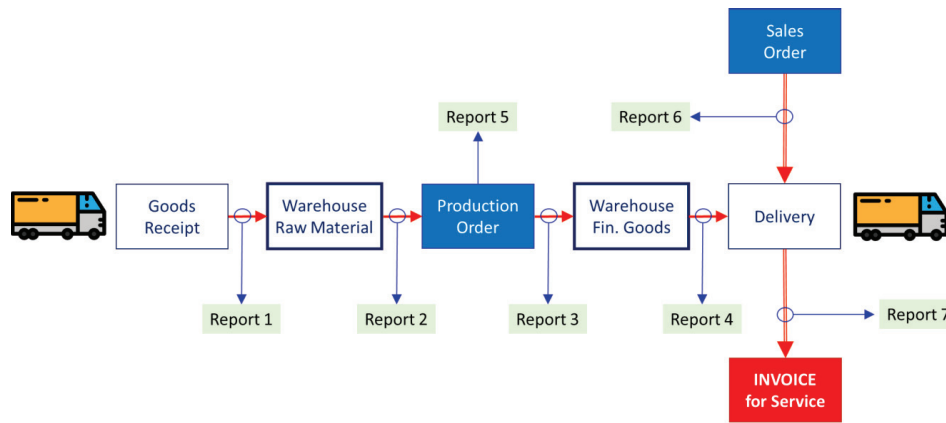


Figure 1: Simplified view of the business process.

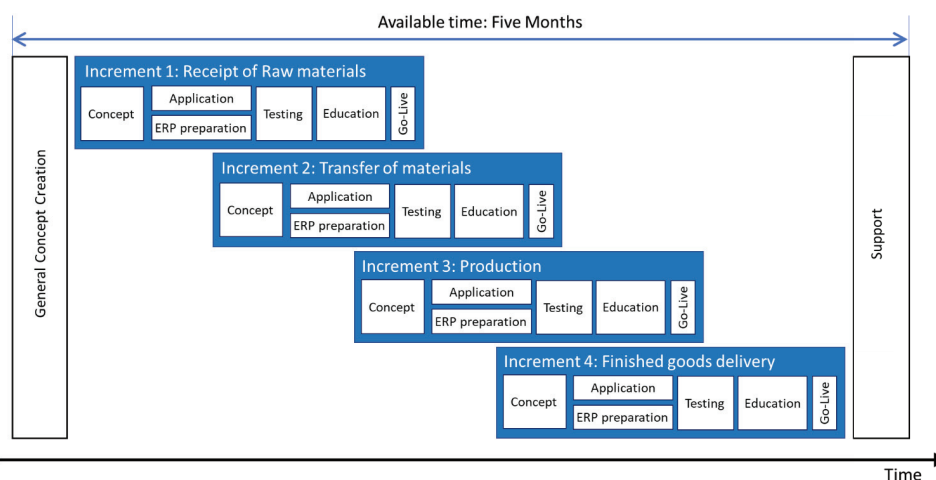


Figure 2: Four increments delivered in five months.

Each increment was thoroughly tested. Functional testing was performed by an external application programmer and ERP consultant while Integrative testing was performed by an ERP consultant and project team members. User acceptance testing was prepared by an ERP consultant, performed by end-users, and controlled by project team members.

Final result

The reception of the first trucks with the Customer's raw material began less than a week after the contract was signed. The technical equipment was ready, and the ERP system was prepared and tested for this first part of the new financial-logistics process. All the quantity of the Customer's raw material was received according to the required rules for traceability defined by the Customer:

- all raw materials are received in a way of scanning the Customer's logistics label on the packaging units
- each packaging unit is recorded in the ERP system separately, with its unique ID number
- every physical movement of packaging units in the warehouse was carried out with a mandatory

accompanying scan of the logistics label and the unique number of the packaging unit

Two months after the first receipt of the Customer's raw material, service production began. The technical equipment was ready, and the ERP system was prepared for the second part of the new business process and fully tested. All quantities were processed according to the required traceability rules defined by the Customer:

- The entry of packaging units with the Customer's raw material into the production process is carried out with accompanying scanning and time recording; the ERP system keeps records of the exact time each individual packaging unit enters the production process
- All produced quantity was packed in required production packaging units and each packaging unit received its unique ID number and time record, exactly as requested by the Customer
- Every physical movement of the product packaging unit within and between warehouses was performed with accompanying scanning and time recording

Less than five months after the contract was signed, the first product deliveries to the Customer began. The technical equipment was ready, and the ERP system was prepared for the new process and fully tested. All the quantity of the Customer's product was delivered in accordance with the defined terms and according to the rules for material traceability required by the Customer.

Also, it should be emphasized that standard processes of regular production of own products took place in parallel and unhindered.

Conclusion / Success factors

The project was a complete success and provided new hope for the sustainability of long-term business continuity. The common conclusion of all actors is that it was a typical example of Change Management, where a major business change was carried out in a seemingly impossibly short period of time, followed by certain technical refinements and necessary interventions in the existing ERP system. The success of the management was most evident in quick, brave, and timely decisions and the top motivation of the project team and all employees.

As an additional conclusion, it was realized that such an intensity of change would not have been possible without the prior existence of a reliable and robust ERP system, which enabled quick corrections and refinements of business processes without loss of stability and reliability.

References

1. Piccoli G, Pigni F. Information Systems for Managers 4.0. Prospect Press. 2019.
2. Denecken S, Musil J, Santhanam S. SAP Activate Project Management. SAP Press, Rheinwerk Publishing, 2020.
3. Rath AK, Mohapatra H. Fundamentals of Software Engineering. BPB Publications. 2020.
4. Nad J. Analytical model of electrical machines in business software. Lambert Academic Publishing, 2018.
5. Nad J. Software engineering and information systems (in the Croatian language). Polytechnik of Medimurje, Cakovec, 2021.

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