

# THE BUSINESS MODEL OF THE INDUSTRIAL AUTOMATION ECOSYSTEM AS A KEY FACTOR FOR THE SUCCESS

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**Abstract:** *An ecosystem in the economic sense describes an association of companies (usually three to about ten) that an orchestrator aligns to create shared value. From the customer's perspective, the performance of the entire ecosystem exceeds the sum of the individual contributions of all participants. Increasingly standardized products, increased risks from new entrants, or stagnant markets mean that many companies are operating in an increasingly competitive environment. For this purpose, in their traditional approach, companies are fighting for market share at the individual company level. However, in order to survive in this new situation, companies must increase their innovation performance, a goal that can be achieved, for example, through the targeted networking of companies to form ecosystems. Companies, therefore, must be viewed not as members of a single industry but as members of a cross-industry system of networked companies (ecosystem). This work will analyze and explain the so-called EPLAN Ecosystem of industrial automation as a critical success factor.*

**Key Words:** *EPLAN, Business Ecosystem, EPLAN Ecosystem, Industrial Automation, Success Factors*

## 1. BUSINESS ECOSYSTEM

To understand the Industrial Automation Ecosystem and its associated benefits, we will first explain and provide a definition of the idea of Business Ecosystems. The term ecosystem originates from the field of evolutionary ecology. Similar to ecology, James F. Moore describes in an article in the Harvard Business Review (Predators and Prey: A New Ecology of Competition) an economic context of companies that are interdependent, similar to circumstances of the relationships in the ecology, and at the same time support each other in their development and "food chain". Increasingly homogeneous products, increased risk from new entrants, or stagnant markets lead many firms to

enter an increasingly competitive environment. To this end, Moore describes how companies in their traditional approach compete for market share at the individual firm level. According to Moore, to be competitive in this new situation, companies need to increase their innovation performance by collaborating with other companies in the not necessarily similar or related industry in a vertical or horizontal sense to achieve the goals. This goal can be achieved, for example, by purposefully networking companies in ecosystems. Moore states that companies should therefore be viewed not as members of a single industry, but as members of a cross-industry system of networked companies (ecosystem) [1].

A good definition of the business ecosystem is provided by Sarafin (2021), who states: "A *business ecosystem is a purposeful business arrangement between two or more entities (the members) to create and share in collective value for a common set of customers. Every business ecosystem has participants, and at least one member acts as the orchestrator of the participants. All members in a business ecosystem, whether orchestrators or participants, have their brands present in the value propositions.*"

The Business Ecosystem is very often linked to the topic of digitalization. Increasingly, we see that the most top-rated enterprises in the world are digital natives that use ecosystem business models to generate customer value efficiently and expeditiously. However, outside of particular vertical markets, such as the software industry, which has been using ecosystems for decades, there are very few enterprises that have a full-fledged ecosystem footprint, let alone a broader operating model structure that is being optimized for ecosystem value creation. The encouraging message for companies that want to leverage ecosystem business models but lack structure and maturity is that there are a rising number of leading practices and a growing workforce that clearly understands the practical elements of building and operating an effective ecosystem business function. Organizations that are integrating ecosystem business

models into their corporate strategies can now feel more comfortable that they can effectively develop the capacity to implement these strategies successfully.

## 2. PROCESS-ORIENTED VS. PRODUCT-ORIENTED APPROACH

If we generally want to describe the differences between process- and product-oriented, we refer to (Payne & Issacs, 2017) who state, that *"The process-oriented approach evaluates how a skill is performed, whereas the product-oriented approach evaluates the outcome of the skill performance."* [3]. While the product approach focuses on realization of the functions that serve, for example, for the concrete problem solution in a software-related task, the focus of the process approach is on the steps that are required to create a work. Thus, in the process approach, the "around" the problem must be understood and taken into account. This is especially important when several participants are involved in the realization of a project.

All these participants have their own challenges and pains, which flow into the project result. A product approach means focusing on an end product. The concept first appeared in teaching and writing and was later adopted by marketers and managers. In marketing, a product approach means that a company focuses on its output rather than on customer demand, needs, and values [4,5].

Companies that focus only on the product-oriented approach, but lose focus on the process-oriented approach, often produce solutions that are only partially usable. Above all, the interface issues are left out of focus, which are especially the intersections between companies that belong in one business ecosystem.

## 3. ECOSYSTEM OF THE INDUSTRIAL AUTOMATION

According to [6], Industrial automation, IIoT and Industry 4.0 are three pieces of a larger "ecosystem": each element enables the others to function. The road of industrial automation into the near future seems to be well defined: What can be made automated, will be made automated. But the "how" is key. This is especially related to strategic perspectives, which have to take the process-oriented approach into account.

For example, if a software company wants to take advantage of the disruptive forces in the age of industrial automation, how can it achieve this? What strategic goals should be considered?

The following activities and considerations are essential:

1. Analyze and understand the business ecosystem of the target customers. The customer-centric awareness is important here, and the question of how to help the customer to be competitive in the long term.
2. Map the ecosystems for different vertical markets.
3. Use a process-oriented approach as a basis for the development of own products, software and

their capabilities. Then define the services to be developed.

4. Recognize disruptions in the value chains. This should be done pragmatically and checked for feasibility. This is particularly important in sectors with high technological risks.

In order to be successful in the long term and to use the new value chains to their advantage, companies must sharpen their sense and understanding of the transformation processes in the industrial automation landscape and realign them [6]. On the way to implement such strategic ideas operationally, internal communication is one of the most essential aspects. This should be well-managed from the top management level through the management levels, well prepared, understandable for employees and pragmatically implementable, because it usually involves changes in the organizational culture.

## 4. EPLAN ECOSYSTEM OF THE INDUSTRIAL AUTOMATION

When developing software solutions for its customers, EPLAN asked itself the following questions: *"How do our companies remain competitive in the long term? How can we make our work in electrical engineering more efficient?"* [7].

Understanding the business processes of the company's own customers was crucial. Analyzing the EPLAN ecosystem of industrial automation, we find that certain participants and stakeholders belong to the ecosystem and that digital networking is essential for long-term success.

How can industrial companies increase the value of their processes and make them faster, more cost-effective and more precise? Rittal and EPLAN automate and industrialize the design and manufacture of switchgear with expert knowledge and seamlessly integrated solutions. The secret to success lies in the continuous collaboration between product development (engineering) and manufacturing, along the integrated value chain shown in the following figure.

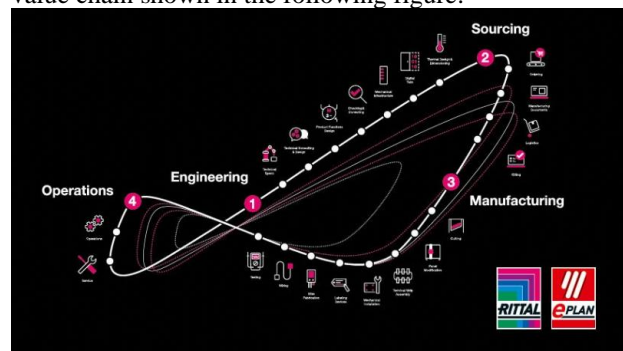


Fig.1 – Integrated Value Chain (Rittal/EPLAN)

Rittal covers the mechanical part and EPLAN the engineering part of the value chain.

According to analyses, it can be stated that they on the combination of advanced software solutions and automated machines such as Perforex and Wire Terminal to create customized solutions for their customers' individual value chains.

As a rule, there are always five participants or stakeholders in the EPLAN Ecosystem: Operators, OEMs, System Integrators, Panel Builders and Component Manufacturers. These are presented in the following figure.

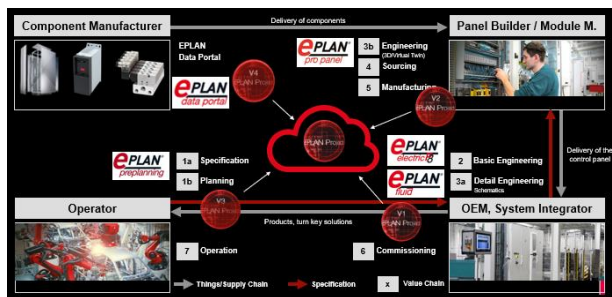


Fig.2 – EPLAN Ecosystem of Industrial Automation

The Operator is usually a large company that defines the requirements for manufacturing e.g. the production line, its specifications etc.. These requirements are implemented by OEMs or system integrators.

OEMs (original equipment manufacturers) are experts in their specific equipment and processes and can often successfully integrate their own equipment into production lines, but System Integrators also have extensive automation knowledge, they integrate various particular equipment or systems from different OEMs into production lines.

When these companies are unable to design and produce the whole lot themselves, they turn to other companies, such as Panel Builders, for help. Panel builders are responsible for building electrical panels. They do this using equipment and components produced by component manufacturers. A component manufacturer is a company that is responsible for designing and manufacturing components that are used by another company to make a product.

The entire process is accompanied by a CAE application, in the best case a one-stop store, in this case EPLAN, which serves each phase or participant in ECO-System, where, for example, cloud technology allows communication and intervention in the design process at each stage of development.

EPLAN Preplanning enables operators in the overall project design process to store engineering data as early as in the pre-planning stage. This data can include actuators and sensors of a plant, machine or building. The data can be imported from external tabular sources. This allows operators to quickly create initial data sheets or specifications for material procurement. The data captured in EPLAN pre-planning can also be used for downstream planning phases in the engineering process, such as for basic or detailed engineering.

EPLAN Electric P8 is a consistent, integrated, and powerful engineering system that OEMs or system integrators can use to plan and design electrical engineering for machines and plants. The software supports a variety of engineering methods: from manual creation to standardized and template-based approaches. The project data entered in the schematic forms the basis for the automated creation of the machine and plant documentation.

EPLAN Fluid is similar in specifications to the EPLAN Electric P8 application, but this engineering tool is specifically designed for the design and automatic documentation of schematics for fluid power systems including hydraulics, pneumatics, cooling and lubrication and is used in basic and detailed engineering.

EPLAN Pro Panel is the integrated software solution that provides panel builders in particular with a stable foundation for the automation and industrialization of their switchgear design. It enables 3D planning and design of enclosures, switchgear and power distribution systems for power distribution. EPLAN Pro Panel offers an integrated solution for panel building.

The EPLAN Data Portal is an online platform of the EPLAN Cloud, in which components of various component manufacturers can be found.

With the EPLAN Data Portal, users of the EPLAN platform have direct online access to high-quality product catalogs of a constantly growing pool of well-known component manufacturers, now over 1.2 million components. All solutions anchored in the EPLAN platform access this web service. The simple transfer of the offered components and data into the EPLAN documentation reduces the design effort and increases the quality of your machine and plant documentation. [8]

All applications are connected via the EPLAN Cloud, which means that all participants of the EPLAN Ecosystem have simultaneous access to the project data, which enormously facilitates project development and progress and minimizes errors.

This process-oriented approach to software development has made EPLAN the international market leader for several years and has over 85% of the market share as the most widely used CAE application in Germany alone.

## 5. CONCLUSION

Along with understanding the disruptive technologies and keeping up with the digitalization progress, one of the essential success factors in product or software development is the knowledge of the Business Ecosystem. In this work, the EPLAN Ecosystem of industrial automation was used as an example to show how following this approach ensures long-term, long-lasting success and, in some cases, a non-competitive market position for a company.

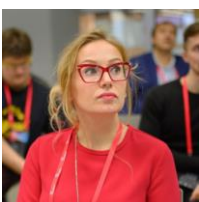
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