

► How Digital is the Agricultural Equipment Sector?

The status of digitalization within the top agricultural players

Management Summary

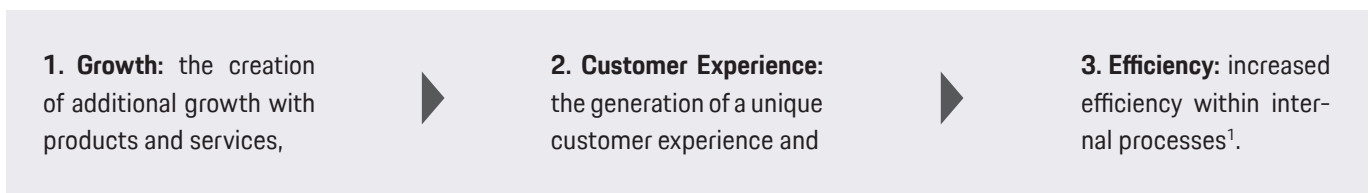
The digitalization of products, processes, services and, in some cases, entire companies is undoubtedly a critical turning point across all industries. Progress varies widely from sector to sector, but the agricultural industry is already well advanced. This report covers digitalization in agricultural equipment manufacturing and services and includes the results of a study on digitalization conducted by Porsche Consulting in 2018. Key takeaways of the study are:

- ▶ The most digitalized firm in this study is characterized as a company with more than 5,000 employees that has distinct characteristics in all questioned criteria and even stronger characteristics in product-specific digitalization topics – in which there are three sub-categories: digital products, digital platform concepts and digital natives in the workforce.
- ▶ The customization of individualized products for clients based on Big Data, as well as the development of purely digital products, are at earlier stages.
- ▶ Real-time information for customers and company-wide internal processes are present to a fairly low extent, however, transparency and process communication remain a key factor in accelerating digitalization.
- ▶ Digital strategies are widely available, but the use of digital processes and key performance indicators for standardizing operations could be improved upon.

Digitalization of the industry

In the history of industrialization, digital transformation is one of the most important milestones since the invention of the steam engine, the introduction of mass production, or the adoption of the microchip. The digitalization of the agricultural

goods industry encompasses all activities that are performed by manufacturers and producers using information-based data processing. The ultimate goal of digital transformation can be captured in three 'impact directions':



On attaining these outcomes, a manifold benefit is created for all stakeholders including the company's customers at every level, its employees (through optimization of working conditions, e.g. ergonomics or assembly support), as well as its

shareholders. In order to reach that goal, digitalized operations have to be integrated across all the major functions of the company and, secondly, a set of enablers within the ecosystem are required, together with a roadmap for realization.

¹Source: Study, 10.12.2017, Porsche Consulting, Digital Machinery Decoded

Agricultural technology has paved the way

The agricultural equipment industry is considered to be one of the silent pioneers of digital transformation. Assistance systems have been available in farm vehicles for more than 20 years, long before being implemented in the automotive industry. Today, the industry is still strong in its use of digital applications: since 2015, smart farming vehicles have contributed 30% in added value, for example².

Like many other industries, agriculture is facing fundamental technological shifts. These can be summarized as:

- ▶ **Pivotal new technologies** – from waiting for spare parts to leveraging 3D printing; and from reliance upon human expertise to self-learning systems, many day-to-day processes are being overhauled. New enabling technologies pose new questions regarding value creation, product and service innovation, and skill sets.
- ▶ **The acceleration of digitalization** – from pure automation to networked machines and AI analytics, and from isolated equipment and machinery to the emergence of integrated value networks, the pace of change is forcing companies to

reconsider their positioning within the ecosystem, how they monetize data and their overall digital competitiveness.

- ▶ **The revolution in buying and retailing** – from traditional supplier or retailer roles to 'productivity partners'; from the combustion engine to alternative energy; from hardware to software and digital services: big changes in the retail chain are influencing business models, customer relationships and product life cycles.

These influences allow a variety of digital applications in the three strategic impact directions (Growth, Customer Experience, Efficiency) and accelerate their development (Fig. 1).

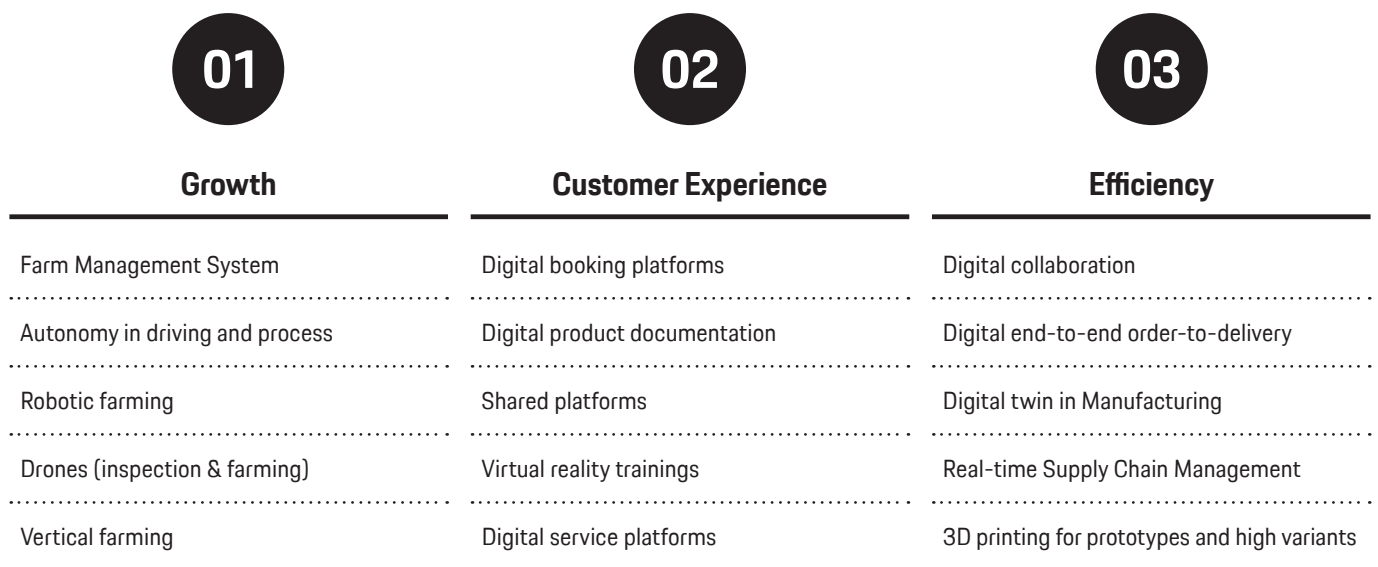


Fig. 1 Exemplary digital applications within the agriculture industry
Source: Porsche Consulting

²Source: Dossier, 09.04.2018, Simone Giesler, Digitalisierung der Landwirtschaft

One paradigmatic example within the agriculture industry is the shift from a pure hardware product to a completely integrated farm management system, which allows the suppliers of equipment and services to optimize and add new areas of growth (Fig. 2). In essence, a successful farm management system embodies seamless connectivity within a local network of machines, as well as within wider networks of external systems and machines. Autonomous machines communicate not only with their accessories but also with other tractors to leverage resource efficiency. The integration of an external weather data

system allows for optimized seed planting and harvesting based on historical data. As the effectiveness of Big Data evolves, error probabilities are minimized while the accuracy of forecasts increases. Furthermore, connecting up irrigation and seed optimization systems to the network will result in more effective use of seeds and water. To summarize, digital applications, expanding databases and an overarching system infrastructure will increase efficiency and ultimately allow for output-driven business models.

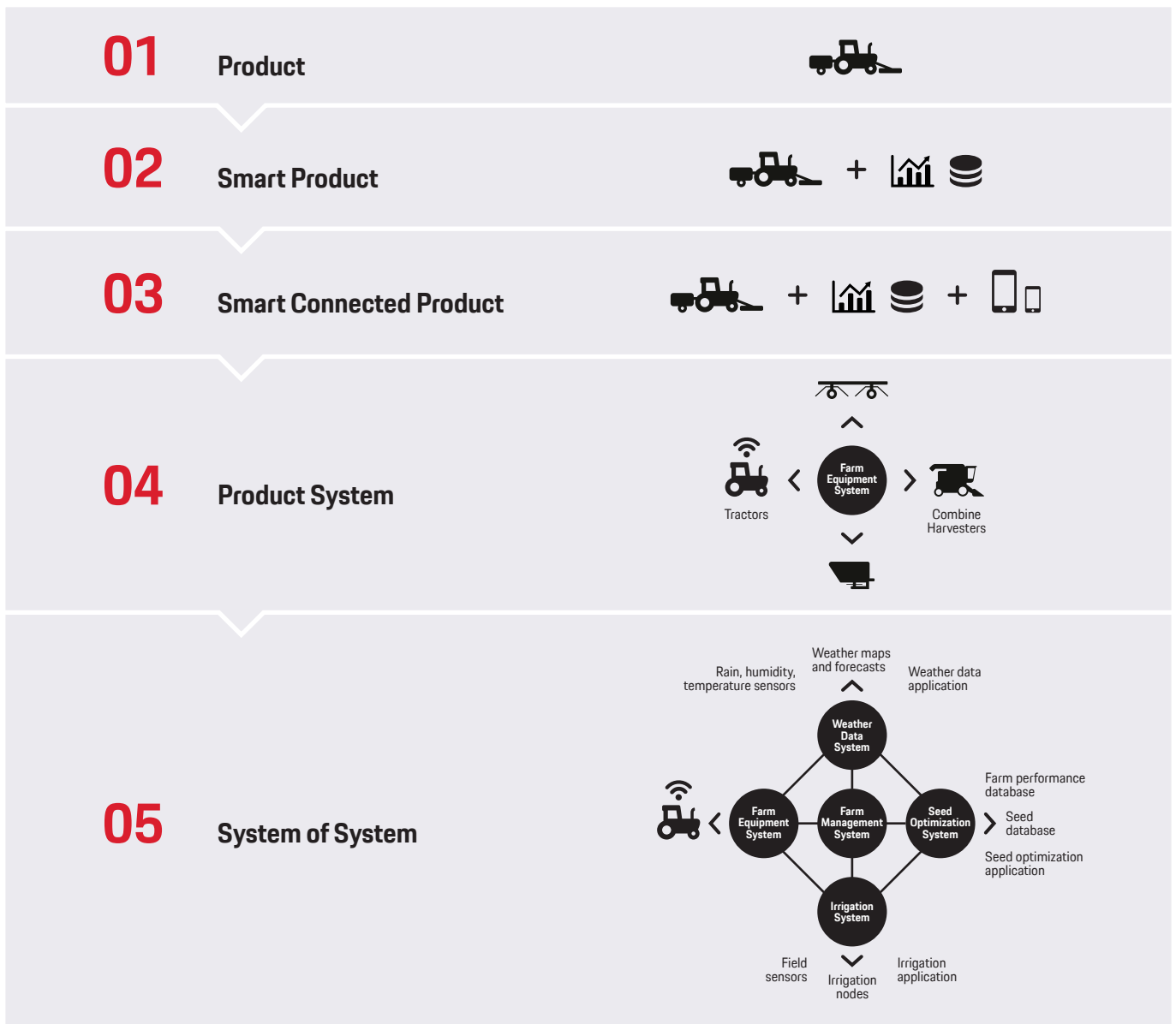


Fig. 2 From hardware to System of Systems in the agricultural industry
 Source: Porsche Consulting based on Dossier, 09.04.2019, Landwirtschaft Sachsen, Digital Transformation Agriculture

Results of the survey

Methodology

In order to generate a snapshot of the current digital status of the agricultural equipment and services industry, a quantitative online survey with industry experts and executives was conducted by Porsche Consulting in the fourth quarter of 2018 over four weeks. Ten companies with the highest turnover from the agricultural industry with at least one location in Germany were surveyed, covering more than 40% of the global branch turnover. The questionnaire contained 10 questions

divided into sub-categories: the first three sub-categories targeted the three focal points of digitization (Growth, Customer Experience, Efficiency) and elaborated on the current situation. The fourth sub-category focused on organizational and procedural enablers for digitalization. The report incorporates the expertise of functional experts at Porsche Consulting who possess hands-on experience with technology-based transformation projects and relevant use cases.

Digitalization opportunities not yet maximized to generate additional growth

Six of the survey questions focused on realizing growth through digitalization, namely digital products, services and business models. For all companies surveyed, the integration of connected, intelligent functions was already strongly developed: 55% of all respondents said that they offered 'smart products' to a 'high' or

'very high' extent (Fig. 3). Only 17% said pure digital products (e.g. Software-as-a-Service) were offered and marketed accordingly. A third of all respondents said they offered open platforms. From the perspective of dissemination and market penetration, this appears to be a mandatory strategic requirement.

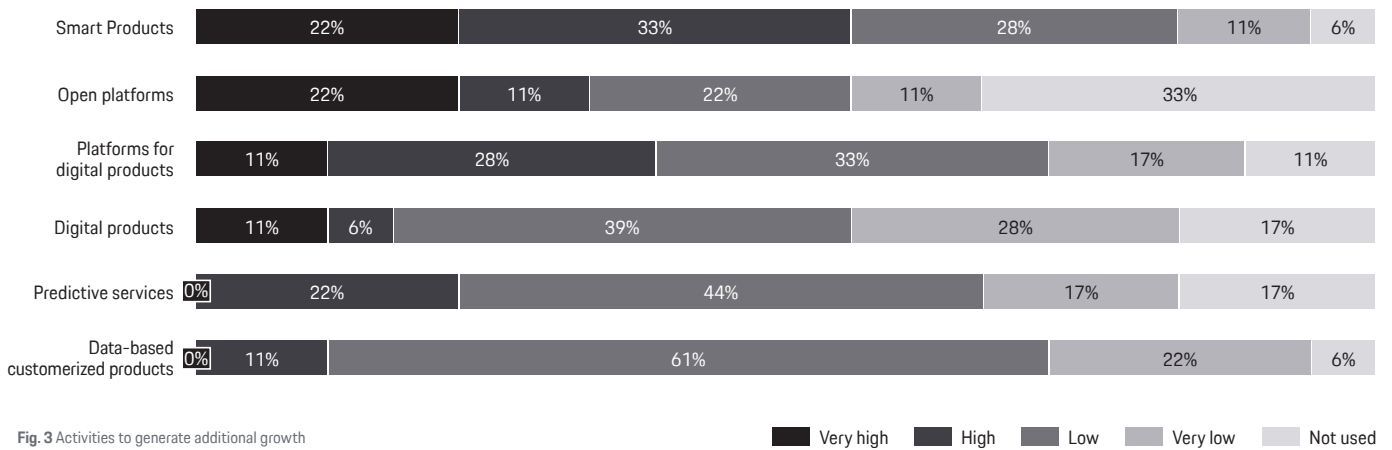


Fig. 3 Activities to generate additional growth
Source: Porsche Consulting

Very high High Low Very low Not used

Best Practice Example

An agricultural service provider supplies a digital platform, which integrates different accessory equipment to one common platform. Not only can third parties connect their products seamlessly to the OEM's platform but the platform also allows for overarching usage of integrated functions via predefined

interfaces. Penetration rate within customers using conventional product has reached 50% already. Possible innovations include the analysis of all customer-specific data with the goal of being able to offer tailor-made solutions and feeding into future innovations (compliant with data protection law).

Apps still main driver for customer experience

The second question block dealt with how digitalization is being used to generate customer experience in terms of digital sales and all forms of customer interaction. The best platform for creating a unique customer experience is the digital application – 22% of all respondents stated that this area was very strongly developed (Fig. 4). There was a particular emphasis on the generation of a consistent customer experience across all communication channels – 62% agreed to that. Furthermore, web-based customer portals with a strong

focus on core products, spare parts and services were 'high' or 'very high' developed with more than half of the respondents.

The respondents acknowledged that they were not very advanced in the area of real-time information. Approximately 20% did not offer this kind of service, more than 50% only to a lesser or very low extent. Only one fifth were offering this service to a 'strong' extent when the survey was taken.

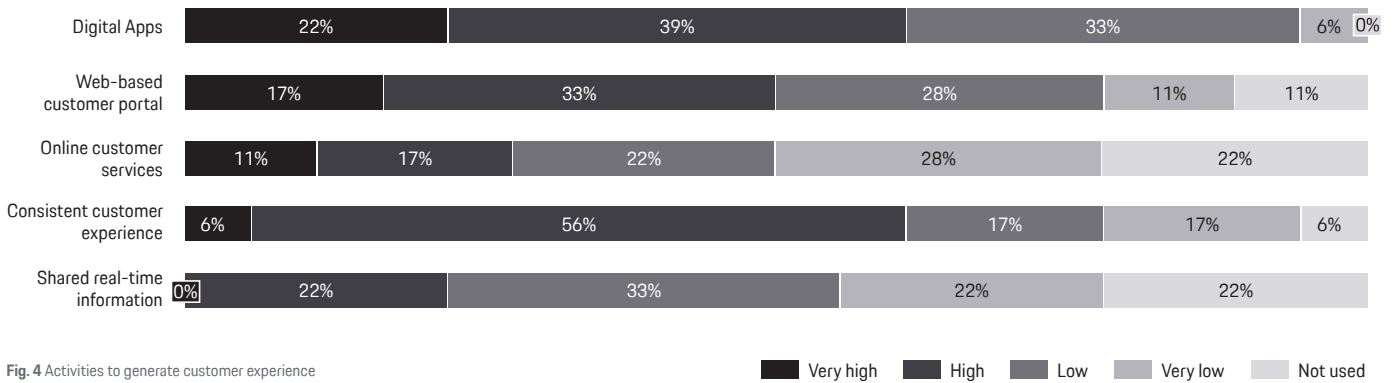


Fig. 4 Activities to generate customer experience
Source: Porsche Consulting

Best Practice Example

An agricultural equipment manufacturer which offers condition monitoring for all hardware products. For this purpose, a large number of sensors in the product converge in a central control unit which is transmitted to the after-sales department, where the product and its operating data is automatically monitored. Since the service was begun, field quality costs have been reduced by 6% due to the

additional data and the accelerated fault elimination process. For critical incidents or necessary service intervals, the customer is actively informed, and measures are proposed. The net result is cost advantages due to a reduction of on-the-ground diagnosis and, in turn, improved capacity planning and improved capacity utilization in the repair shops (up to 20%).

Increasing efficiency through substitution of paper-based processes

Regarding activities to increase internal efficiency, the substitution of paper-based processes with digitalized ones was very pronounced: 73% of all respondents rate this as 'high' or 'very high' (Fig. 5).

To a large extent, machinery and plant parks were also integrated into the IT infrastructure. Half of the interviewees agreed to a 'high' or 'very high' degree. However, the next step towards

profiting from the data (for example through forecasting models) was still rather weak: 83% of all answers were in the range between 'low' and 'not used'.

As for general analysis of the data for purely informative purposes, this was only being carried out to a small extent with 61%; and just under a quarter of the respondents rated this kind of use as 'high' or 'very high'.

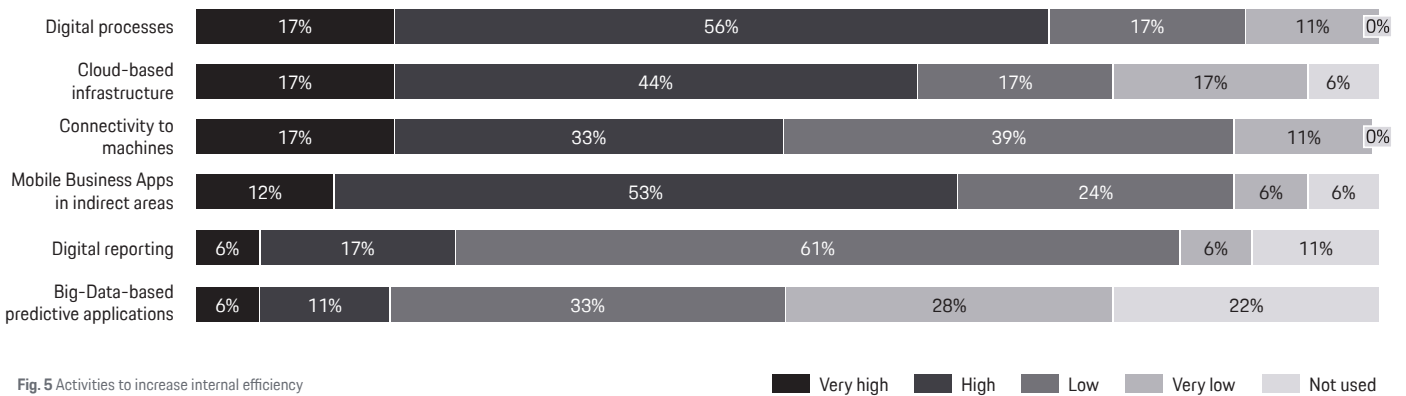


Fig. 5 Activities to increase internal efficiency
Source: Porsche Consulting

Best Practice Example

An industrial goods company has transformed its complete Order-to-Delivery process for the digital age. All process steps are seamlessly integrated within several IT systems. This creates the highest level of transparency for all stakeholders: real-time sales forecasts enable direct

suggestions for inventory management and all effects are immediately transparent on the time schedule. Initial measures on the supply chain have already leveraged 4% profit and loss effective inventory reduction.

Digital strategies broadly available

Finally, in order to assess the requirements for digitalization, the participants were asked the following questions: Does a strategy exist? Do competent employees work with the right attitude? Do processes exist? And, is the implementation status tracked? The answers showed that a digital strategy was broadly in place. Two-thirds of all respondents said that such a strate-

gy already exists (Fig. 6). The use of processes to operationalize the strategy leaves room for expansion. Only 44% of all respondents believe that the necessary processes already exist today. Transparency about the degree of implementation can also be significantly improved: only 17% of the respondents stated that this was already being used to a large extent.

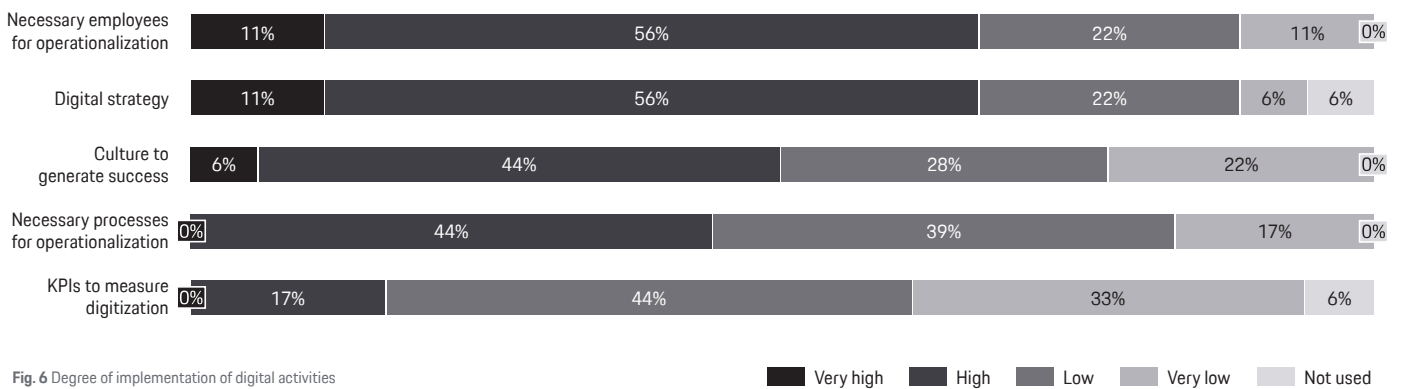


Fig. 6 Degree of implementation of digital activities
Source: Porsche Consulting

Best Practice Example

An agricultural equipment manufacturer that has set up a digital after-sales strategy with a strong focus on a measurable transformation. All strategic initiatives are planned in detail

on a sequential time path until 2025. The first initiative of a fully digitalized support process has already paid off with a 50% decrease in response time and internal efficiency gains.

Characteristics of the most digitalized company

The results of the study not only indicate the current status of digital transformation in the agriculture industry, but also answer the question, "Who is the most digitalized company?". As shown in Fig. 7, the current industry benchmark exceeds the average in every dimension. The benchmark represents an agricultural OEM with more than 5,000 employees. The company generates more than €1 bn revenue and allocates more than €50 m for its digitalization budget.

Compared to the industry average, the benchmark exceeds explicitly in the dimension of Growth. In the three sub-categories of digital products, platforms and digital natives it is particularly

strong: firstly, products and digital payment solutions are already in place. Furthermore, the benchmark utilizes digital platform concepts widely and has the right people to operationalize digital strategies across all levels.

However, the benchmark shows lower deviation to the average in the dimensions Customer Experience, Efficiency and Enabler. Its usage of real-time data is, in some areas, even below average companies. Furthermore, taking ownership of a consistent customer experience across all communication channels is not a point of differentiation for the benchmark which is predominantly on the same level as the average.

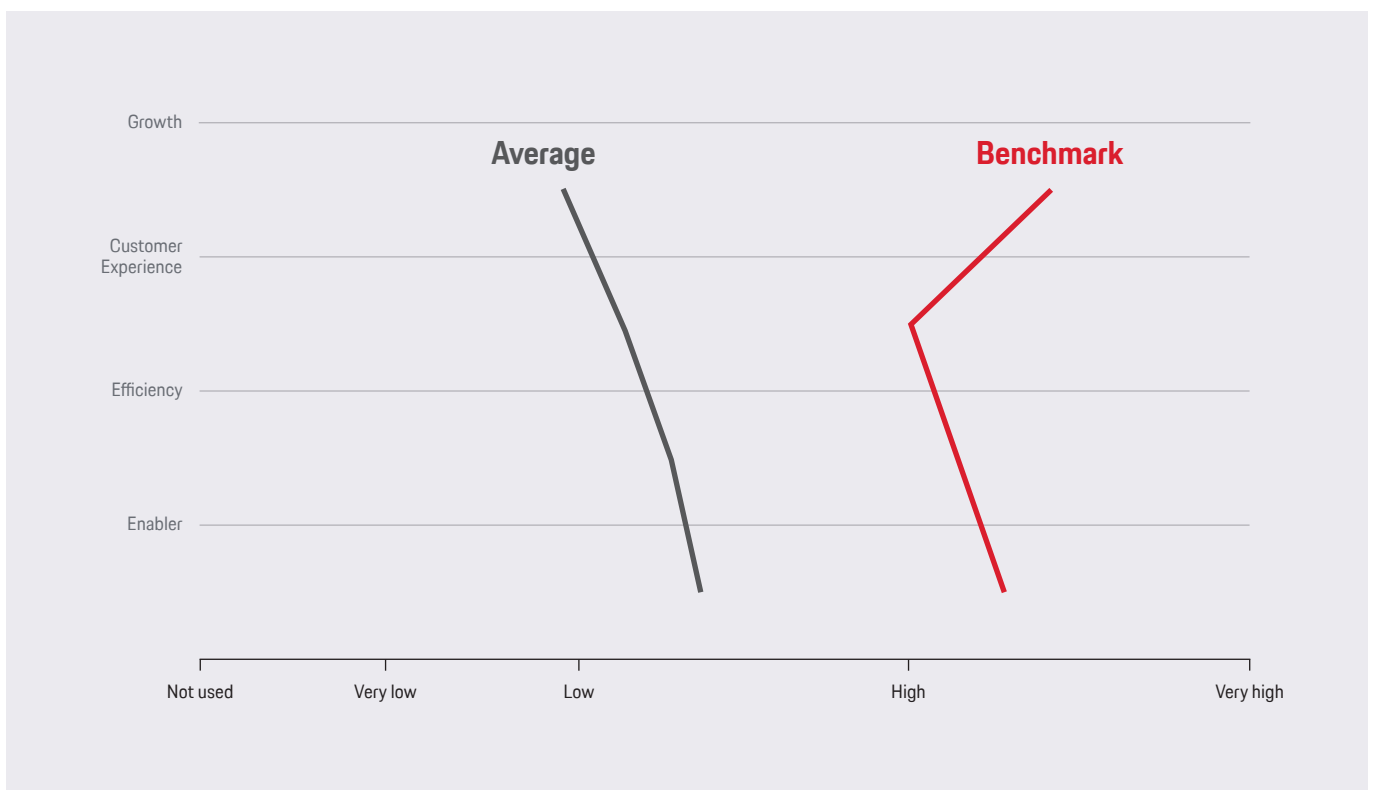


Fig. 7 Benchmark company compared with average from all replies
Source: Porsche Consulting

Implications and recommendations

What should agricultural OEMs and service provision companies do in order to retain the ground they've gained? Firstly, the **Growth** dimension plays a very central role since this is where the benchmark outperforms the industry average strongly. In particular, the sub-categories digital products and digital business models are aspects which are worth focusing on. When providing digital platforms, consider using them as open platforms for all, including market competitors: The benchmark is already doing so.

Regarding the dimension of **Customer Experience**, it is apparent that in the area of real-time information there is an opportunity to stand out from the competition in order to offer a special experience to customer groups. It is even more essential therefore to gain a more comprehensive understanding of the data correlations between product, customer and interaction.

The dimension **Efficiency** is critical for enabling internal changes towards fully digital processes. Therefore, nearly real-time, reliable forecasting processes seem to present a

significant opportunity. The basis for change must be built on a foundation of transparency.

In addition to the digital strategy, which in many cases is already formalized, it is vital that the enabling factors are in place for the execution. In particular, the implementation processes and tools for strategy tracking have to be clearly defined.

When raising the question of what the right steps on a content and resource management timeline are in order to advance digital activities, it is clear that the direction of the future impact must be determined first. Only then can the transformation process be designed in detail. Finally, the changes have to be successfully executed, taking into consideration all potential adjustments.

Porsche Consulting has a validated and tested framework for this (Fig. 8), which is based on a complete playbook enabling companies to steer their digitalization activities using a structured and well-thought-out roadmap.

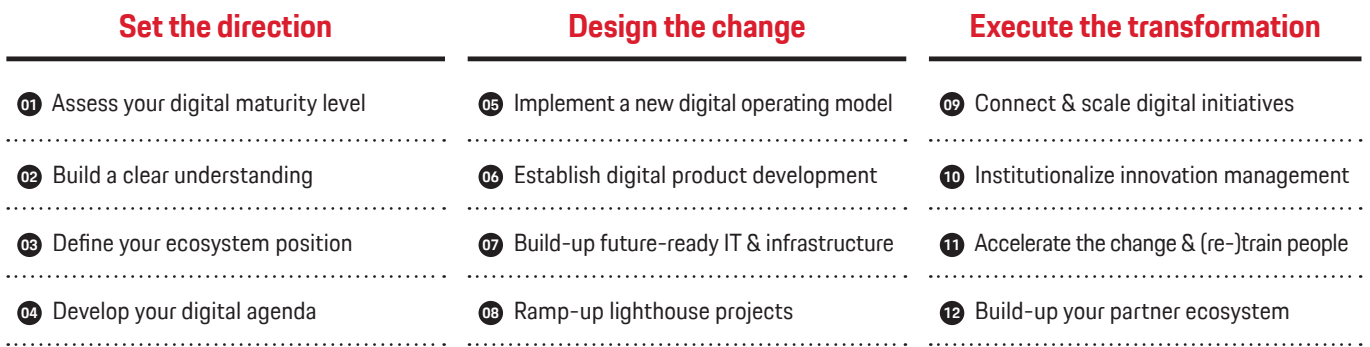
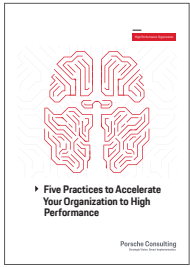


Fig. 8 Practical step-by-step guide on how to master the digital transformation
Source: Porsche Consulting

Further Reading

Porsche Consulting regularly publishes reports and articles on major trends, innovations, and ways to keep companies competitive.



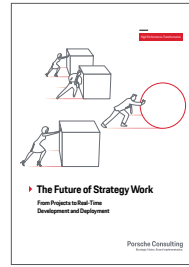
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**High Performance
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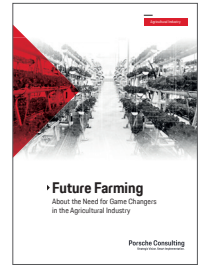
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Strategy Paper
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White Paper
**Business Process
Management**



White Paper
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