

9 TIPS – HOW TO BENEFIT FROM THE LATEST PACKAGING INDUSTRY TRENDS

Ideas and suggestions for companies in the
packaging industry

 VISUAL
COMPONENTS



“Sustainability” is one of the biggest challenges facing the packaging industry, and it will undoubtedly require changes. Understandably, there are widespread concerns regarding the amount of work involved in making these changes, and what they will cost.

This e-Book explains how companies that use and build packaging machinery can meet and take advantage of this challenge. It explores how sustainability and other trends are an opportunity to strengthen a competitive position, and it offers insights into innovations and technologies that those in the packaging industry can use to their advantage.



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Packaging industry trends

What you should keep in mind

The global packaging industry has thrived in recent years, but that can change. Companies in the packaging industry should take this opportunity to prepare for the many new challenges starting to emerge.

In recent years **sustainability** has become one of the hottest of these trends. In the future it appears environmental friendliness and multi-purpose usability will be decisive factors for consumers, backed up by legal guidelines for **“green” packaging**. At the same time, this packaging must not cause a disproportionate increase in product prices and must maintain the perceived product quality.



Food industry regulations are becoming equally strict. For printed packaging it's required that transfer of substances from the packaging material or inks to the food, especially those with mineral oil residues, be prevented. At the same time, “active” packaging should extend shelf life and thus minimize food waste.

Product piracy reduces revenue for brand-name companies and jeopardizes consumer health, as shown by the impact of product counterfeiting in the **pharmaceutical industry**. Combining initial opening protection and track & trace technologies offers good protection against copying, supplemented if necessary by optical security features.

Digital printing will also continue building momentum due to the increasing variety of products with shorter product cycles and the trend towards packaging individualization.

Packaging industry trends

What you should keep in mind

Consumer habits, markets, and technologies are constantly changing. The challenges for businesses in the packaging industry are increasing due to internationalization, technological progress, and rapidly evolving customer demands.

In the future, in addition to environmental sustainability and product safety, innovative, lifestyle-oriented packaging will play a key role in consumers' purchasing decisions. With increasing levels of globalization, a seamless chain of information regarding transportation and the use of active packaging will become more important.

There is no doubt that the packaging market will experience rapid change in the years ahead. This prompts the question: how can users and manufacturers of packaging equipment take advantage of the opportunities hidden within these current trends?

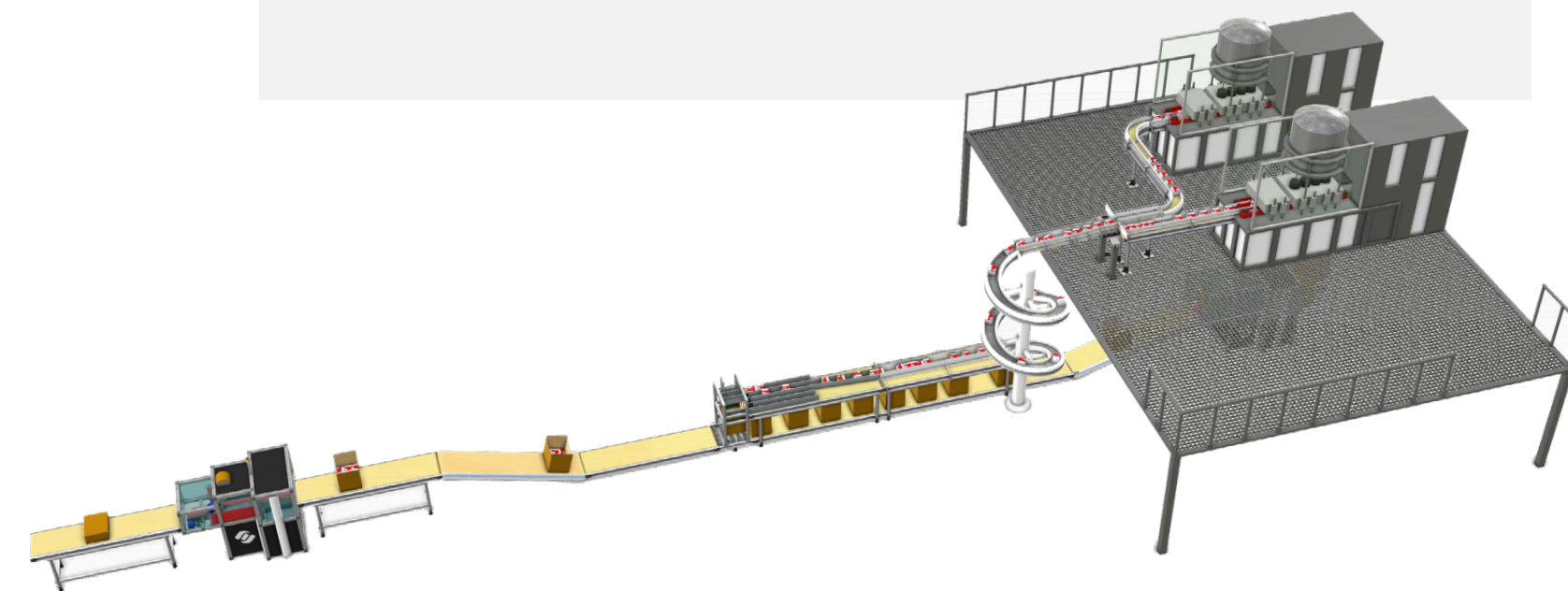
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Article: DHL: 3D Packaging Simulation success stories

In this case study, see how DHL, the world's largest logistics company uses Visual Components manufacturing simulation to power the adoption of automation in the age of accelerated digitalization.

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Innovative technologies for packaging machinery

Companies that recognize a trend and take proper measures in good time can exploit emerging opportunities to their advantage.

Some of the issues featured on the following pages will probably sound familiar. Some of the ideas and suggestions for addressing them may be new, inspired by a technology unfamiliar to many industry leaders – **software for factory planning and simulation.**

This innovative technology can reveal new ways of solving old problems and help find solutions to new and emerging challenges. It's a tool for identifying possible improvements and communicating ideas so manufacturers can offer their customers attractive packaging solutions. Through this they can remain successful and relevant in the future.



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1 SUSTAINABILITY

Preparing for recycling

From an environmental perspective, the packaging industry does not have a particularly good reputation. The news is full of alarming accounts of growing landfills and plastic waste in the oceans. As a result, there's growing pressure to take more action towards a sustainable circular economy. However, the core function of packaging cannot be compromised: it must continue to protect the product it contains.

Considerable progress has already been made: beer bottles now weigh only a third, PET bottles half, and beverage cans only a quarter of their former weight. Recycling has also increased significantly with packaging waste becoming raw material.

This is good, but the packaging industry wants to do better. Nestlé, for example, has committed to making all its packaging recyclable or reusable as soon as 2025. In parallel, Coca-Cola is working on a bottle made entirely of paper.

From this it's clear that a lot of packaging is going to be completely re-imagined. This means big changes for packaging machinery, all of which will require design, simulation and manufacturing before being placed into service.

Factory simulation software supports the move towards increased sustainability in packaging. Future production lines and packaging facilities can be designed, planned and simulated – digitally. Define processes and packaging sequences with visual workflows and prepare for commissioning virtually. Use a digital twin, i.e., a digital representation of the plant, for early detection and resolution of potential problems. Optimize plant operations to enhance reliability and lower costs.

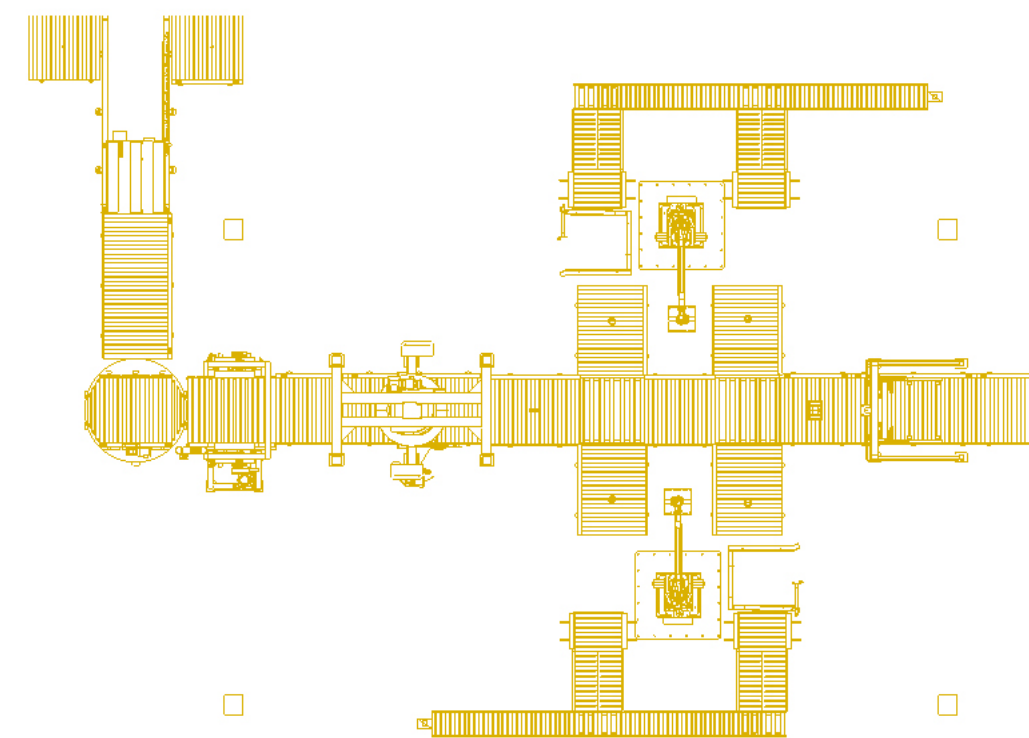
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2 FACILITIES

Integrate new packaging machinery into existing factory buildings

In most operations, product packaging is carried out at the end of production, i.e. in close proximity to the manufacturing facilities. However, in a long-established site that has grown over many years space is often limited and poorly configured. Such a situation calls for packaging equipment with a compact design that's suitable for incorporation into the existing factory buildings.



Such challenges are quickly resolved by using factory design software. The first step is to create a model of the building. This is done by either importing existing architectural drawings or performing a laser scan of the building interior and importing the resulting point cloud.

Next, lay out the packaging plant. Drag-and-drop factory components from the design software library into the 3D environment. Plug-and-play functionality makes it easy to connect components like conveyors. Then define material flows and packaging operations with visual workflows. **Verify the new packaging plant will fit in the existing building and has optimal material flow using factory simulation software.**

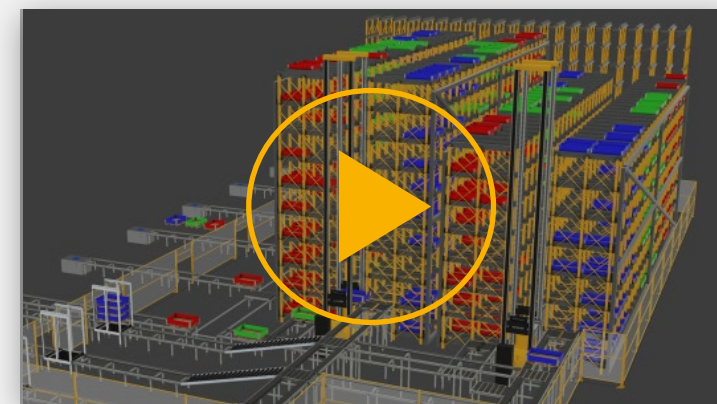
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3 PROCESS OPTIMIZATION

Reducing cycle times and maximizing throughput

In many situations there's more than one way to perform a particular packaging task or operation. To illustrate this, consider a box that must be turned through 90° to pass through sealing and on to palletizing after filling. Two ways in which the box could be reoriented are by using a robot or with a turntable. Speed and cost are the major decision factors, although flexibility for different box sizes and weights might be a third consideration.



VIDEO: Design, Optimize, and Visualize New Production Solutions with Visual Components

A factory simulation can quickly resolve such questions. Begin by recreating the layout of the packaging area, using components from the library included with the software. Choose from a wide selection of robots, machines, and equipment from dozens of leading manufacturers in industrial automation. Non-standard or custom equipment can be brought into the simulation by importing existing CAD models. Robot movements are defined, modeled, and programmed with simple, easy-to-use tools that can perform reachability analyses and check for collisions. **Factory simulation software enables cycle time and throughput studies that speed up production – with time and cost savings documented in concise reports with detailed statistics.**

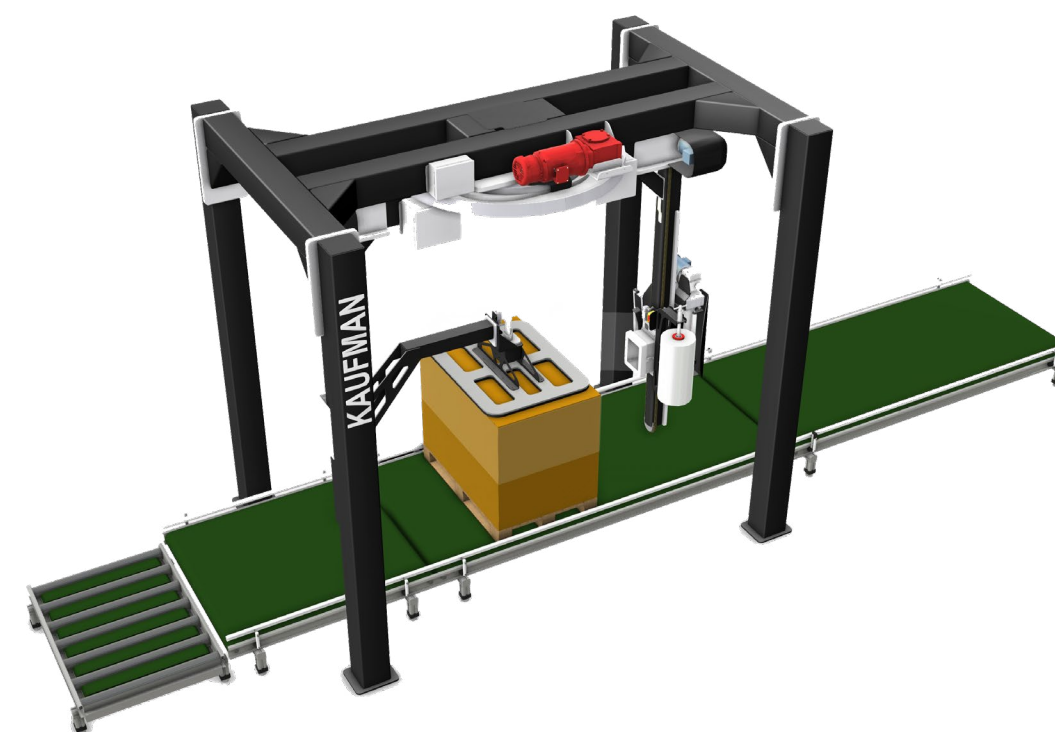
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4 SPECIAL PURPOSE MACHINERY

Integrate special or custom machinery into an existing production line

Packaging products is often a complex process with many individual steps. For efficient operation each piece of machinery or process equipment must integrate with those upstream and downstream. Special purpose machinery, such as custom film wrappers, labelers and inspection systems pose particular challenges. Precise coordination with other packaging line components is critical to avoid bottlenecks, inefficient operation or excessive and unnecessary complexity.



Factory simulation helps answer questions such as what capacity is needed, how much space is required, are key elements accessible, and is material flow as streamlined as possible? Such information simplifies the integration of a special purpose machine into an existing packaging facility.

Build the model by importing CAD drawings of the special purpose machine into the factory simulation software. Add other factory components from the library provided. Simulate the exact operation of the special purpose machine in the context of the other production and packaging equipment. Test and validate digital model functionality by connecting the simulations to packaging control systems via PLC link and prepare for production start-up. Show buyers of special purpose machines their equipment at work in a virtual factory.

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5 IMPROVED RELIABILITY

Detecting and avoiding potential problems before equipment is installed

It can take a lot of time to commission a packaging line and overruns and delays are common. A particular problem is when testing reveals errors in control software that then take time to resolve. This is where virtual commissioning can help. Virtual commissioning allows some testing tasks to be pulled forward to earlier phases of the project. This reduces the risk of unplanned delays and can shrink the overall timeline by moving some of the testing off the critical path.

Virtual commissioning starts with a simulation model of the factory. This virtual factory is then linked to the existing control system. The simulation is then run, before procurement and assembly, to verify the design of the packaging equipment or line and test the control system. Any potential or actual sources of control problems will be identified earlier in the project when they can often be resolved faster and with less expense than if found after installation.

Material flows within a factory or plant, from the delivery of the raw materials to the shipment of the end products, must be closely integrated with production. **With factory simulation software material flow can be analyzed and possible bottlenecks identified before equipment is installed or even purchased. Opportunities to improve coordination between production facilities, conveyor technology, and warehouses will be identified, resulting in inventory and leadtime reductions.**

Perishable products like some foods and pharmaceuticals are especially sensitive to leadtime variation. High expectations for cleanliness and safety mean food with a limited shelf life requires uninterrupted cooling and prompt distribution. Simulating production, storage, and in-plant material flow helps avoid unnecessary production delays and supports inventory optimization.

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6 INCREASED FLEXIBILITY

Readying packaging equipment for changeover

Customers' desires are constantly changing. This is leading to ever shorter product lifecycles, particularly in markets such as consumer goods and electronics. The life of production and packaging equipment is much longer, in part so as to justify the high initial cost. Thus most packaging equipment will be retooled and reconfigured for new pack formats multiple times over its lifetime.

Here's an example of where flexibility is needed: the large discounters in the food sector demand so-called mixed cartons. These let them offer different variants of a product in one case rather than needing several single-variety cartons. This saves shelf space but requires modular sub-mixing systems integrated into the packaging process.

The modifications required in the production and packaging processes can be evaluated through simulation. Working in the model, add components like sub-mixing systems to the existing packaging line. Then explore the impact of changed carton sizes on the programs used by palletizing robots. **Factory planning and simulation software makes it possible to build a digital twin of the packaging line, prepare virtual commissioning, and identify and fix potential problems early on during the transition.**

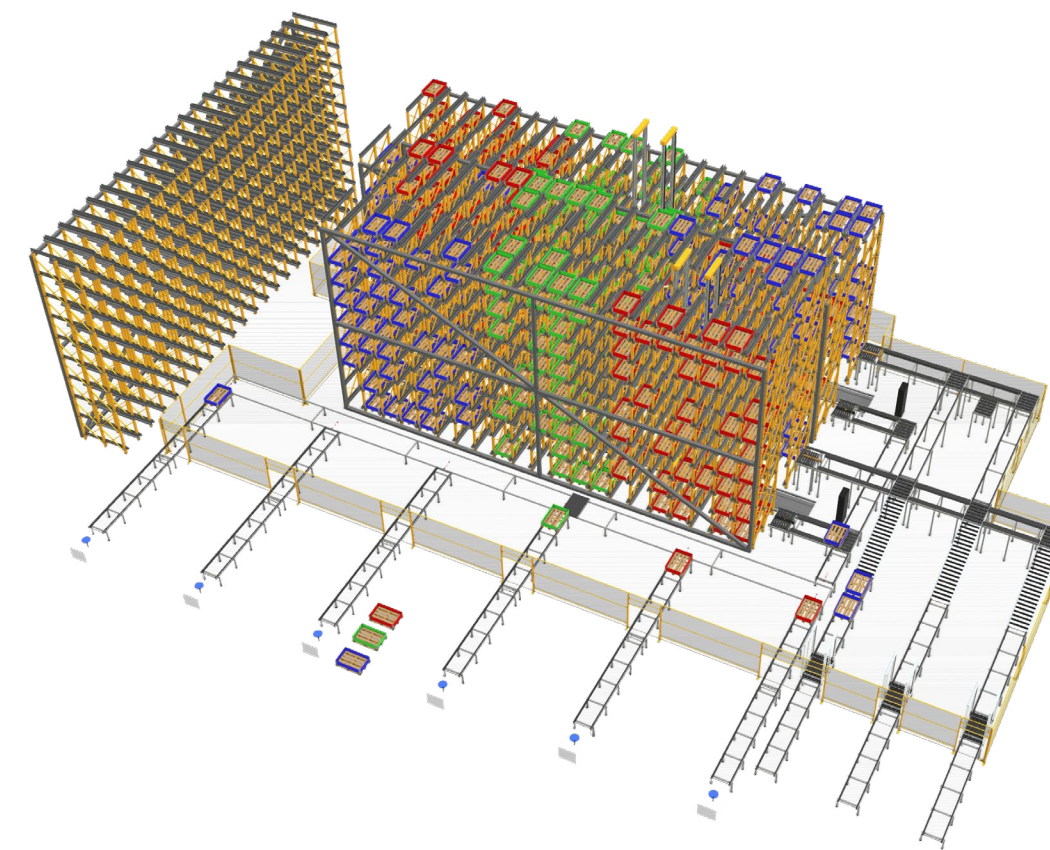
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7 INCREASED COMPETITIVENESS

Finding ways to lower costs

For all the skills of the packaging designers, it's the product that customers buy. The packaging comes with the product, but as a rule, is discarded afterwards. For this reason, not only must packaging material be cost-effective, but so too should the packaging process.



Find ways to lower the cost of the packaging process during the concept phase by modeling the line long before it's built. Performing detailed studies of different solutions is a fast and risk-free method of determining which approaches will yield the lowest costs. **In many cases the first solution considered is not the best. Factory simulation software enables evaluation of far more alternative scenarios, potentially resulting in significant OpEx and CapEx cost savings.**

For many products warehousing and intralogistics form a large part of total product costs. Use simulation to right-size the warehouse so production and packaging can continue running even if deliveries are delayed. Likewise, simulation can help optimize warehouse processes to handle peaks in demand. Unless evaluated and prepared for in advance, problems could arise if the system is called on to access many of the same products within a short time.

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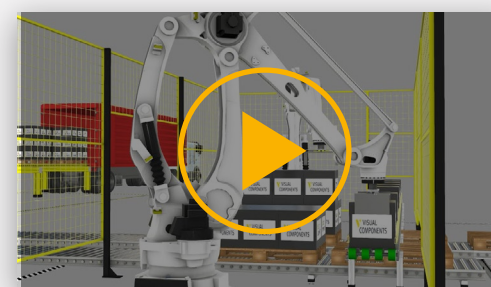
MARKETING AND SALES

How to communicate benefits more clearly and win more business

For packaging machinery manufacturers it is not enough to provide technologically leading products; they must also convince clients of the value of the solutions proposed. Complicating this, technical drawings alone may not be sufficient as some decision-makers find these unintuitive.

A far more compelling approach is a simulation where the customer can see their machine operating in a virtual environment. Furthermore, the figures, diagrams, and statistics produced by a factory simulation add further weight to case being presented.

For sales and marketing purposes a plant can be modeled by incorporating 3D models of factory components from well-known brands. These are included in the library of components included with the simulation software. Then connect plant components such as roller conveyors via simple plug-and-play features. If a specific machine is missing, it can either be modeled in a simplified way or import it directly from the machine designer's CAD system. **Factory simulation costs a little effort but brings a significant return in sales.** It can even let a potential customer "immerse" themselves in their plant via virtual reality.



PLAYLIST
Demo Layouts
created with Visual
Components



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9 PREDICTIVE MAINTENANCE

Improving packaging machinery reliability

Installation of an innovative packaging solution should not be the end of the customer-machine builder relationship. As a sophisticated, high value asset with a long life, it will require some level of ongoing maintenance.

Predictive maintenance seeks to avoid or minimize failures by implementing maintenance measures carried out in response to changes in predetermined criteria. This data comes from sensors installed on the machinery that measure characteristics such as temperature, vibration and noise.

For the machine builder, predictive maintenance is an additional service to offer the customer. This helps the customer avoid unplanned downtime and maximize utilization while providing the builder with an additional revenue stream.

A predictive maintenance model can be created with the help of a digital twin. A factory simulation system is ideally suited for creating a digital twin of a factory or packaging line. What's more, not only can predictive maintenance data be used to improve the reliability of machinery already in service, it can also be incorporated into the development of new products, so further improving the quality of the solutions offered.

Visual Components supports manufacturers and machine builders with factory planning and simulation

Visual Components is one of the world's leading suppliers of factory planning and simulation software. For more than 20 years solutions have been deployed around the world from our headquarters in Finland. Users comprise both huge organizations such as **DHL**, **KUKA** and **AGCO**, and a large number of smaller companies. Visual Components solutions are easy to use, visual and powerful. Whether clients need to develop, analyze and display production or packaging solutions quickly or are looking for a platform to extend offline programming capabilities – Visual Components has the solution.

3D factory simulation software from Visual Components makes it possible to design and validate production and packaging solutions. We have developed a flexible, scalable, and future-proof solution for simulating factory operations and material flows in manufacturing and packaging. Our interfaces offer many integration possibilities to optimize plants, increase turnover and improve customer satisfaction. Visual Components software is used every day by companies both large and small because it's the right tool for addressing their challenges.

When businesses begin exploring the use of factory simulation software there's sometimes concern regarding costs and the learning curve. Questions may be asked as to whether this is the right tool to solve the current challenges. Here's our response:

This is a tool that will be used over and over, on multiple projects and to address many different challenges. In this way our software contributes to cost reduction in general and helps businesses become more competitive.

Simulation also benefits the customers of those who use our software. Superior design and performance of production machinery will lead to increased efficiency and lower costs. **By offering superior products and communicating their benefits more effectively, simulation helps machine builders serve their customers better. With simulation everyone benefits!**

DHL Case Study

3D Packaging Simulation success stories.

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QING Case Study

Using 3D Simulation Technology to Set up a Face Mask Factory During the COVID-19 Pandemic.

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Savushkin Case Study

Packaging Automation in the Dairy Industry.

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Visual Components delivers solutions tailored for specific needs

We understand that users of packaging equipment, suppliers of complete packaging solutions and manufacturers of special machinery have differing requirements and challenges. To address these needs **we at Visual Components offer distinct production simulation solutions tailored to the applications and type of usage.**

To explain: companies manufacturing complete packaging solutions need different solutions to those producing special machines such as stretch machines, labelers, or palletizers - simply because their needs and requirements are different. This is why we don't offer standard products but instead provide custom-fit solutions, regardless of whether a business has five or 50,000 employees.

One of the advantages of our technology is that users are not tied to a particular hardware or software provider (e.g., a robot manufacturer or a CAD provider). The Visual Components library includes factory components from several leading manufacturers. In addition, interfaces with a wide range of CAD data formats mean models can be imported quickly and easily.

The best, and easiest, way to learn more about Visual Components is through a personal product demonstration. This can be delivered via the Internet, meaning there's no need to travel or even leave the office. Contact us using the details below or [click on the website link](#) and fill in the contact form. We will quickly get in touch to arrange an appointment for a personal demonstration.

We look forward to helping you benefit from the latest trends in the packaging industry.

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Visual Components Web eCatalog

Browse through the Visual Components web eCatalog and discover what's on our robust library of over 2,500 pre-defined and ready-to-use components.

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Ready to simulate your next packaging and palletizing project?

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