Here, the Nemetschek Group's software solutions meet the requirements of the central working method within the planning, construction and administrative process for buildings known as Building Information Modeling (BIM). BIM, an integral part of the digitalization of the construction industry, is used to digitally record and connect all design, quality, timing and business requirements and data. This information is used to create a virtual, three-dimensional, semantic building model. Time and cost planning aspects are added as fourth and fifth dimensions right from the simulation phase. BIM therefore helps to identify and correct planning errors as early as the digital planning phase and thus before construction actually begins.

As one of the pioneers in this market, the Nemetschek Group has been following this integrated BIM approach for more than 30 years. Building Information Modeling enables efficient and transparent collaboration and improves the workflow for all those involved throughout the entire planning and building process and subsequent use phase of a property or infrastructure project. Data generated via BIM throughout the entire construction process also form the basis for a digital twin – a digital image of a building that is created during the planning phase and continuously enriched with updated information throughout the entire building lifecycle, e.g. on the building construction, the building physics and energetic behavior and the building use. This allows forecasts to be made of changes to the building itself or its use. Ideally, the digital-physical connection is bidirectional. That means that the digital twin can cause changes in the physical object, and these changes are registered in the virtual copy. As a result, information and implications from each phase of a building's lifecycle – whether related to cost, durability, or user experience – can be applied to other phases. Ultimately, these insights can help architects, engineers and building managers design and operate efficient and sustainable buildings. This accumulation of data, also in conjunction with artificial intelligence (AI), is called Building Lifecycle Intelligence (BLI).

The Nemetschek Group is also one of the leading companies in developing and promoting OPEN BIM solutions and workflows to enable seamless and open cooperation between the various disciplines – regardless of their choice of software. The OPEN BIM standard also makes it possible for the Nemetschek Group's software solutions to communicate seamlessly with competitors' software solutions via open data and communication interfaces (e.g. IFC from buildingSMART). Nemetschek is thus making a key contribution to further establishing this digital method of working as a standard in the AEC/O industry. This allows the seamless transfer and documentation of all information, data, and digital models relevant to construction throughout the building's entire creation and operational cycle.

From a sustainability perspective, the Nemetschek Group's software solutions also contribute to more resource-efficient planning and construction and subsequently more efficient operation across the entire lifecycle of buildings and infrastructure projects. In addition, a structure can be efficiently rebuilt even years later because its details are precisely documented. This more energy- and resource-efficient way of working is therefore an indispensable basis for achieving the climate targets set by policy-makers at both national and international level.

For creative and accurate planning and implementation along the building life cycle, 3D visualisations are becoming increasingly relevant. Visual effects create a realistic environment for the building contractor, decision-maker or consumer. With the Nemetschek Group's solutions, planners and architects can quickly, easily and precisely create 3D models from drawings and make more informed decisions based on the exact structural or dynamic visualizations.

The Nemetschek Group's 3D animation solutions also support artists in optimising their creative workflows, e.g. through 3D modelling, simulation and animation, tools for editing, motion design and film production as well as rendering solutions for high-end production. The professional solutions for producing 2D and 3D digital content are used to create and render visual effects for feature films, TV shows, commercials and games, as well as for applications in the areas of medical illustration, architecture and industrial design. Since the beginning of 2022, the portfolio also includes ZBrush, an Oscar-winning sculpting and painting software used by renowned film studios, game developers, designers, in the advertising industry and by illustrators worldwide.

Segments

The Nemetschek Group's total of 13 brands (previous year: 15) are divided among the four segments of Design, Build, Manage and Media & Entertainment according to their respective end markets and customer groups. The changes within the brand portfolio are explained below in the individual segment descriptions. The segments are responsible for implementing the Nemetschek Group's operating activities in accordance with the objectives and strategic framework specified by the holding company.

Design	Build	Manage	Media + Entertainment
ALLPLAN	BLUEBEAM	CREM SOLUTIONS	MAXON
FRILO	DROFUS	SPACEWELL	
GRAPHISOFT	NEVARIS		
RISA			
SCIA			
SOLIBRI			
VECTORWORKS			

Design Segment

The individual brands within the Design segment target a broad range of different disciplines within architecture, design and engineering. In terms of revenue contribution, the key brands in the Design segment are Graphisoft, Allplan and Vectorworks.

Major customer groups include architects, designers, engineers from all disciplines including structural engineers, specialist planners and landscape designers, as well as developers and general contractors. The solutions offered enable customers to carry out their tasks across all phases, from planning and design right up to factory and construction planning. The portfolio particularly features OPEN BIM solutions for computer-aided design (CAD) and computer-aided engineering (CAE), which are used in 2D and 3D building design and imaging. These are complemented by BIM-based solutions for quality assurance and control and to avoid errors and conflicts during the planning and construction phase.

As of January 1, 2022, the SDS/2 brand was integrated into Allplan as part of the ongoing process of harmonization within the segments. The merger with SDS/2, a provider of software solutions for detailed steel construction planning, further strengthened Allplan's position as an expert in platform-based BIM solutions for building lifecycles. The Graphisoft and Data Design System brands also combined forces. Combining technology and expertise from Graphisoft – the provider of BIM software solutions for architecture – and Data Design System – the planning software specialist for technical building installations – has expanded the expertise and worldwide availability for their customers.

Build Segment

In the Build segment, the Nemetschek Group offers integrated complete 5D BIM solutions from the bidding and award phase to invoicing, budgeting, scheduling and cost calculation. This also includes commercial ERP (Enterprise Resource Planning) solutions for construction-related accounting from the Nevaris brand and PDF-based workflow solutions for digital work processes, collaboration and documentation from Bluebeam – now the Nemetschek Group's strongest brand in terms of revenues. Since the start of the 2022 financial year, the Build segment has been rounded off by the dRofus brand, which until the end of 2021 was still allocated to the Design segment. Its data management and BIM collaboration solutions for supporting workflows and providing building information throughout the entire building lifecycle help meet the requirements of the segment's customers.

The segment's customers include construction companies, developers and building suppliers, as well as general contractors, planning offices, architects and civil engineers.

Manage Segment

The Manage segment bundles the competencies of the Nemetschek Group's smallest business segment in terms of revenues. Key customers come from all areas of professional property management, including property managers, facility managers, globally active property companies, banks, and insurance companies.

The segment's two brands – Spacewell and Crem Solutions – offer software solutions across all commercial processes in property management as well as modular and integrated solutions for property, facility and workplace management (IWMS, integrated workplace management system). The portfolio also includes a smart building platform that uses intelligent sensors and big data analysis to help improve productivity and efficiency in the operation and management of buildings. These are complemented by artificial intelligence-based energy management solutions for optimizing the use of energy in buildings and reducing CO_2 emissions.

Media & Entertainment Segment

With the Maxon brand, the Media & Entertainment segment primarily targets customers from the international media and entertainment industry in addition to architects and designers. These include film and television studios, advertising agencies, the video games industry, product and graphic designers, and creative freelancers.

Maxon is a provider of professional 3D modelling, painting, animation and rendering solutions for the creative industry. All over the world, creative professionals from a wide range of fields use the solutions to create 3D motion graphics, architectural or product visualisations, graphics for computer games, illustrations, visual effects and much more.

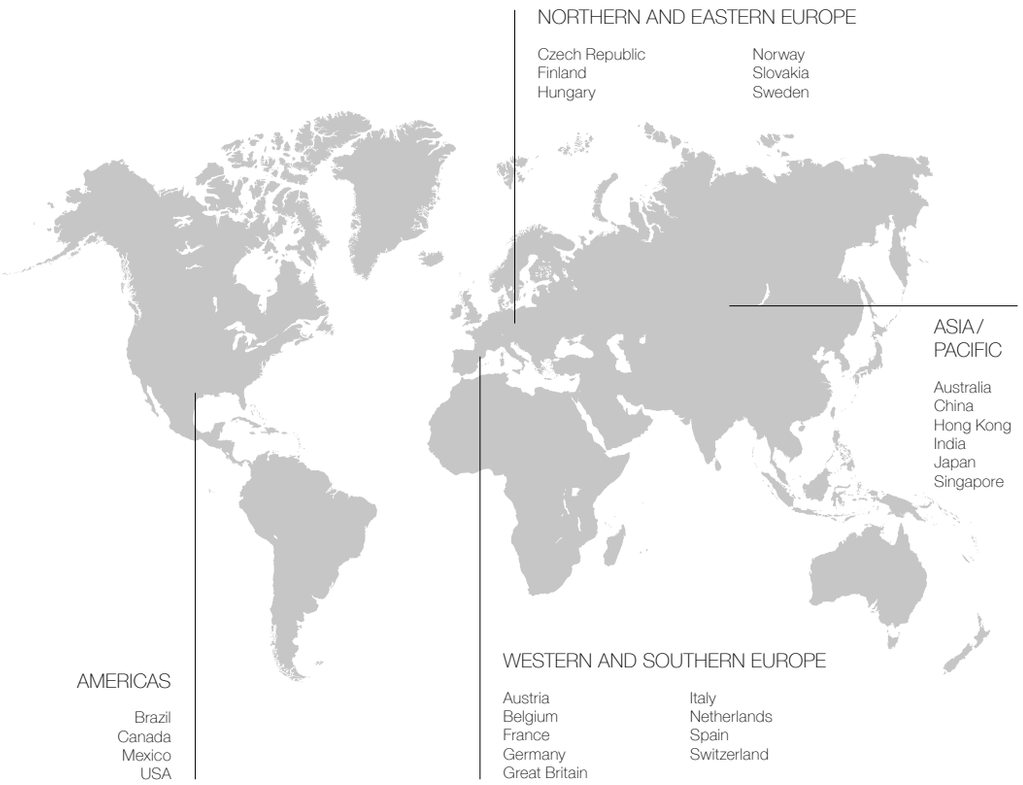
Maxon's product portfolio helps artists and creative professionals optimise their workflows. The Maxon ONE product suite includes the Cinema 4D suite for 3D modelling, simulation and animation, the integrated Red Giant product range with tools for editing, motion design and film production, and the Redshift rendering solutions for high-end production. In 2021, Maxon acquired the 3D application forger, expanding its portfolio to include professional sculpting workflows on mobile devices. With the product release of the new version of Maxon ONE in autumn 2021, numerous new functionalities were released.

The key figures of the four segments are detailed under *<< 3.3 Results of Operations, Financial Position and Net Assets of the Nemetschek Group >>*.

Locations

Nemetschek SE is headquartered in Munich, Germany. The Nemetschek Group's 13 brands develop and market their solutions worldwide from a total of 81 locations.

NEMETSCHEK LOCATIONS WORLDWIDE



Drivers, Market and Competition

Growth Drivers

The global construction industry is at the beginning of a new, prolonged growth phase. The growing world population, increasing urbanization and the associated rising demand for housing are key drivers here. The construction industry already generates around 13% of global GDP. By 2030, the construction industry market is expected to grow by 42% to around EUR 13 trillion.

This comes in addition to the shift toward a more sustainable world, which requires extensive investment in, among others, infrastructure. At present, 36% of annual global energy consumption is attributable to the construction and operation of buildings. In view of this, there is growing demand for efficiency, quality and sustainability in the construction industry.

A further significant growth driver is the digital transformation of the construction industry, which is far less advanced than in other key industries such as the automotive industry. Studies show that the construction industry in Europe has a digitalization level of only 7%. This means the construction industry has a significant need to catch up with the use of digital technologies. This represents great market potential for Nemetschek. IT expenditure in the construction industry is expected to increase by around 13% annually in the next few years.

Optimizing the interaction of all processes through systematic digitalization will offer the industry a more than 20% increase in efficiency by shortening construction times, improving quality and lowering costs. Large parts of this transformation can already be implemented efficiently by using existing technologies, thanks to the world's leading BIM method.

The Nemetschek Group benefits from several drivers in its three core segments of the AEC/O industry:

- Digitalization in the construction sector remains weak. Catch-up effects and increased investment in industry-specific software solutions that control processes more efficiently and therefore increase quality and reduce costs and time expenditure are becoming increasingly important.
- State regulations that require or make the use of BIM software mandatory for state-financed construction projects are paving the way for further growth of the Nemetschek Group worldwide. Alongside the USA, the UK and the Scandinavian countries are particular pioneers in Europe when it comes to BIM regulations and the use of BIM-enabled software solutions.
- The rising use of software over the entire building lifecycle is required by the BIM regulations to enable a model-based and continuous workflow. Starting with the transition from 2D software solutions to model-based 3D BIM solutions, through the increased use of solutions for cost and time calculation and collaboration to products for the efficient use and management of buildings, the Nemetschek Group brings its solutions to all phases of the construction lifecycle and meets the requirements of an integrated workflow.
- Furthermore, the topics of sustainability and environmental protection are becoming increasingly important in the planning, construction and operation of buildings. This is particularly true for the construction sector, as buildings and the construction industry are responsible for 40% of total CO_2 emissions. A more energy- and resource-efficient way of working throughout the entire construction process, including the subsequent use phase, is therefore a critical factor in achieving the climate targets set by policy-makers (e.g. European Green Deal). Intelligent BIM software solutions for more sustainable and resource-conserving construction, as well as more efficient building operation, form an indispensable basis for this.

Overall, the digital transformation in the AEC/O market will continue to lead to increased demand for solutions that ensure digital workflow in the various disciplines of the Design, Build and Manage segments. These market conditions provide the Nemetschek Group with a suitable framework for its further growth. It should be noted that the degree of digitalization and the above-mentioned drivers have different effects on the respective segments. In the Design segment, the markets are already being penetrated by software solutions. Here, the Nemetschek Group sees the transformation from 2D to 3D solutions as a key driver. But the situation is different in the Build and Manage segments where digitalization is still less developed, so that investments in software solutions are likely to play a strong role in driving the market.

Sources: UN Environment Programme (Dec. 2020) – 2020 Global Status Report For Buildings And Construction; McKinsey (Oct. 2020) – Rise of the platform era; Oxford Economics (Sept. 2021) – Future of Construction.

Market and Competition

The Nemetschek Group is a globally leading company in the AEC/O software market. In 2021, the global AEC/O software market amounted to around EUR 14 billion. Estimates assume that the market will grow by an average of 11% per year until 2024.

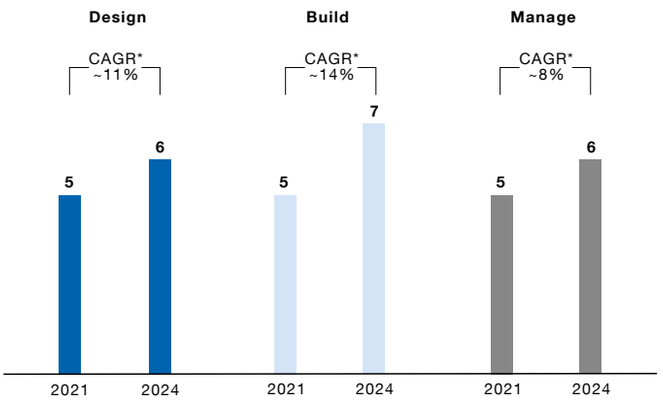
The Design market segment has a historically higher degree of maturity, as digitalization in this area was promoted earlier than in the other market segments. An average market growth rate of around 11% is expected here for the period of 2021-2024.

The Build segment's market is expected to grow from around EUR 5 billion in 2021 to an anticipated EUR 7 billion in 2024, corresponding to an average annual growth rate of around 14%.

In 2021, the market volume in the Manage segment amounted to around EUR 5 billion. By 2024, the segment is expected to grow by around 8% per year to around EUR 6 billion.

GLOBAL AEC/O SOFTWARE MARKET

End-user expenditure in EUR billion



* Compound Annual Growth Rate.
Sources: Cambashi BIM Design Observatory, Nemetschek Research.

The AEC/O software industry can be described as a fragmented competitive environment. Therefore, depending on the segment and region, the Nemetschek Group faces competition from different companies. Although the market has increasingly consolidated over recent decades, there are still a large number of small local companies. By contrast, the Nemetschek Group is one of the few global companies actively driving forward the process of consolidation through acquisitions.

In the Media & Entertainment segment the Nemetschek Group addresses the 3D animation market, which has great market potential and high rates of growth.

The global 3D animation market is estimated to be worth USD 18.3 billion in 2021 and will rise to around USD 40 billion by 2028. This corresponds to an average growth of around 12 % annually. Rising demand for high-quality content and animation by creatives and increasing use of visual effects (VFX) in films and videos are some of the key factors, along with integration of artificial intelligence (AI) in 3D animation, driving the market growth. In addition, the proliferation of VFX in the entertainment industry and the recent trend of using VFX in advertising and infomercials to showcase products with 3D elements is driving the growth of the 3D animation market.

1.2 Targets and Strategy

As in previous years, the strategic positioning of the Nemetschek Group is based on three key characteristics. These three characteristics apply to the medium term and form the basis of the company's strategic approach:

#1: With its software solutions, the Nemetschek Group supports **digitalization** along the entire construction lifecycle – from the planning and construction phase to the operating and renovation phase. This strategically integrated approach makes it possible to bundle and focus investments and expertise on the customer-oriented segments and thus offer end-to-end support for customers in the building lifecycle. At the same time, the Nemetschek Group's solutions enable the workflow in the construction lifecycle to be improved thanks to their end-to-end approach. Added to this are digital solutions for visualizations, 3D modeling and animation, which, in particular, find a market in the media and entertainment industry as well as the construction industry.

#2: With four segments under the umbrella of a strategic holding company, the **group structure** enables the Nemetschek Group to bundle the competencies of its 13 brand companies in the best possible way in the customer-oriented segments of the AEC/O industry and in the Media & Entertainment area. This structure is intended to increase the benefits and added value for the customer. The focus here is on the integration and cooperation of several brands in order to offer an integrated and more networked range of solutions. The objective is to further improve cooperation between the various professional groups in the construction industry and to make this cooperation more efficient. The brands are "experts" in their specific customer segment, and therefore have a high level of expertise in their respective market segment. The segment and brand approach ensures that market changes can be quickly recorded, analyzed and evaluated and that customer requirements can be responded to promptly. At the same time, they benefit from synergies at segment and Group level with regard to internationalization and sales strategies, the exchange and sharing of best practices, and development activities.

The **Design** segment pursues the strategy of providing a broad and integrated range of services to the respective customer segment. A strategic component here is bringing together brands with a common customer base. This offers the opportunity to exploit synergies between the brands and create further added value for customers by bundling competencies, expertise and technologies.

The aim of the merger of the Graphisoft and Data Design System brands that took place in the year under review was to expand their range of integrated, multidisciplinary planning solutions. The step-by-step merger of the Allplan brand with Precast Software Engineering (in 2021) and the SDS/2 brand (in 2022) combined knowledge, expertise and technology to enable a seamless, integrated BIM workflow to be mapped from planning through to production and construction. In this process, the platform-based BIM solution takes "buildability" into account right from the start to ensure continuous BIM workflows, including during the transition from the planning phase to the construction phase. The smooth transfer of data, including all relevant information for the construction companies, is essential for keeping construction projects within their cost and budget framework.