Our universal value is to make our world better through the software we supply. I believe our mission is to provide outstanding software and services that underpin the activities of manufacturing companies as they consistently produce exceptional products. This is how we can ensure that Zuken serves our world better than ever.

Facing an unprecedented tide of technological innovation, today’s manufacturing companies are constantly striving to heighten their own unique advantage. Zuken will continue supporting these companies by providing cutting-edge IT solutions and outstanding consulting services within each individual customer’s product development process. Rallying all our resources, we will boost our capabilities at both the organizational and individual levels so that we can fully address a wider range of needs than ever before. Above all, we will continue striving to be worthy of our role as our customers’ partner for success.

Message from the President

Makoto Kaneko
President and Representative Director, Zuken Inc.
Zuken is a global provider of cutting-edge software and consulting services for electrical and electronic design and manufacturing. Our focus on R&D ensures customers maintain their competitive edge.

Since its establishment, Zuken’s core business has been the development of the electronic design automation software needed to implement the advanced functions of today’s ever-evolving electronics products. Zuken’s software is now used by electronics manufacturers worldwide, together with our unique solutions for managing electronic components and design data based on extensive expertise in electronics design.

Today’s automobiles employ a range of electrical and electronic systems that are becoming ever more complex. Zuken develops and sells the electrical wire harness design software that is the linchpin of their development, as well as electrical and electronic control and design software for industrial machinery and equipment. From planning and design to production, Zuken software creates a collaborative environment for the supply chain of the automotive and machinery industries.

Zuken Tec provides consulting, on-site manager and engineer dispatch, as well as contracting services, that support a broad range of design and development operations, including CAD installation, startup, and operation.

Zuken NetWave sells and supports state-of-the-art hardware and software for corporate networks, which are indispensable for today’s business activities. These networks also include security and storage solutions.

Zuken Elmic focuses on communication as the key element in technologies. It develops, sells, and provides support for middleware IP libraries, software, and related hardware for the embedded systems that support the security, industrial, and in-vehicle networks.

Zuken PreSight develops and markets creative products that support the manufacturing industry, including product lifecycle management (PLM) systems, based on technology that coordinates lightweight 3D data and bill of materials (BOM). It also provides knowledge management solutions with a unique concept that reduces user burden.

DiverSync is devoted to planning and development of IT platforms to realize synchronized and bi-directional collaboration between design and manufacturing, which is the new normal in the age of the Internet of Things.

Zuken Alfatech provides a variety of solutions and services primarily to customers in the mechatronics industry, including development, sales, and support for electrical CAD. It also provides and customizes 2D/3D general-purpose mechanical CAD and CAE systems. As a new business area, Zuken Alfatech is also developing 3D modeling applications for the construction field, which is a domain with excellent potential.
Zuken opened the floodgates with Japan’s first CAD/CAM system for PCB design in 1978.

Our CAD/CAM technology established an unshakable position amid growing demand for smaller, thinner, and lighter electronic devices.

In addition to a global sales network, our global R&D network is ready to capture best-in-class technologies from around the world.

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Global Network

Challenges in the Global Markets Accelerate Our Growth

- **Japan & Asia**
  
  Our head office is in Yokohama, the city where Zuken was founded. The head office oversees product and business development in Japan and worldwide.
  
  The operating environment faced by manufacturing industries is increasingly global and borderless. Companies look to Asia not only as a manufacturing base, but as an important center for product development. We have therefore established subsidiaries in China, South Korea, Taiwan, Singapore, and India. We have built a system for accurately identifying the needs of customers in each region to offer the best possible solutions.

- **Americas**
  
  North America has many innovative companies that greatly influence manufacturing worldwide, and is also an important business development base for Zuken. In this market Zuken provides many leading U.S. high-tech companies with advanced solutions. In addition, to develop products and businesses for global markets, the Zuken SOZO Center promotes strategic partnerships with companies that own innovative technologies.

- **Europe**
  
  Zuken has a strong business foundation in Europe, a region that is home to many leading companies in global markets such as industrial machinery and automotive products. We complement our European sales network with bases that carry out core technology development. Our Global Automotive and Transportation Competence Center in Germany is part of Zuken’s organization for developing next-generation automotive electronic and electrical design solutions for global markets.
Financial Information
A Solid Financial Foundation

For the manufacturing industry, product development is an important, fundamental operation that determines future growth. Zuken provides solutions required for competitive product development. For us to support our customers’ strategic product development and give them long-term confidence in our solutions, we must have solid financial foundations ourselves.

Also, in the world of information technology, where technological innovation is intense, we must invest flexibly in order to continue providing cutting-edge technology in a timely manner. For this reason, since our founding, we have established and maintained a solid financial foundation as one of our most important management strategies.

### 2018 Highlights

<table>
<thead>
<tr>
<th>Operating income ratio</th>
<th>Shareholders’ equity ratio</th>
<th>Current ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>8.6%</td>
<td>69.0%</td>
<td>344.3%</td>
</tr>
</tbody>
</table>

### Financial Information

- **Net sales**
  - 2018: 23,182 (Billions of yen)

- **Total assets**
  - 2018: 43,647 (Billions of yen)

- **Operating income**
  - 2018: 2,025 (Billions of yen)

- **Shareholders’ equity**
  - 2018: 30,119 (Billions of yen)

- **Dividends**
  - 2018: 2,000 (Billions of yen)

Note: The 2016 dividend includes a commemorative dividend of 10 yen.
Artificial Intelligence Offers Answers for Design Challenges

AI in Zunken’s Solutions

The capacity and reach of artificial intelligence has grown considerably in recent years, and applications of AI in society are gathering speed. In the field of manufacturing, the use of AI is expected to solve a number of issues, including technology transfer problems due to the aging of experienced personnel and human resource shortages. We at Zunken are also preparing to incorporate AI technology into our design support solutions in the electronics field.

AI Shows Huge Potential across a Number of Societal Contexts

The field of artificial intelligence has become a keen focus of interest, highlighted for instance when the computer program AlphaGo* defeated the world’s leading human Go player two years ago. AI is not a new technology – it has existed since the mid-20th century – but it has now become easier to gather the vast amount of digital data that is necessary for learning, while the processing capacity of computers has also increased dramatically. In particular, this has resulted in great advancements in the field of machine learning. For example, in image recognition systems based on machine learning, it has been determined that discrimination capacity can exceed that of humans, and it has been demonstrated that AI has the ability to surpass human capacity in other cognitive tasks as well. AI is thus expected to find its way into various facets of society, such as improving work efficiency and contributing to problem solving. Zunken believes the incorporation of AI technology is indispensable for solutions development, and is collaborating with diverse partners in research in this area.

Importance of Selecting AI According to Objective

To gain more insight on the topic, we spoke to Professor Moritoshi Yasunaga at the University of Tsukuba’s Integrated Systems Laboratory, which is providing Zunken with academic support on the use of AI. The term AI gives the impression that it is one specific technology, but in reality there are many categories of AI. In addition to machine learning, which makes it possible for computers to replicate the kind of learning that comes naturally to humans, other AI research fields include pattern recognition, search and optimization, and natural language processing, each of which has considerable depth. Moreover, there are numerous methods to realize those technologies, such as with the neural network approach that imitates brain neurotransmission (e.g. deep learning), the evolutionary intelligence approach that imitates the process of evolution of organisms, and the swarm intelligence approach that imitates the activities of agents performing collective actions, such as ants. (See Box 1) In utilizing AI, it is important to have a full understanding of the characteristics of each realization method and to select the technology and approach that is most appropriate for the objective or problem to be solved.

AI in Electronics Design

Under the guidance of Professor Yasunaga, Zunken has been testing out various AI technologies and approaches, and is laying the groundwork to support efficiency improvement and problem solving in electronics design. For example, for predicting final printed circuit board size and cost at the initial stage of design, and for identifying the many false errors that are detected during design rule checking, we are promoting an approach of improving accuracy by applying the deep learning model for a large volume of existing design data and design rule checking data. However, as Professor Yasunaga points out, "Deep learning using neural networks is especially effective for image recognition, speech recognition, and pattern recognition, and is therefore ideal for applications such as inspection accuracy, estimation, and control. But it is not that useful in design applications for supporting solution search and optimization." He emphasizes the importance of selecting the AI technology and learning method that are most appropriate to the objectives. "For supporting electronics design itself, I believe that the genetic algorithm approach of evolutionary intelligence, which is an AI technology imitating the evolutionary process of organisms, will be more effective," Professor Yasunaga adds. "Actual examples of effectiveness include using design for aircraft and body design for automobiles, and most notably the body design of the N700 series of Shinkansen trains." An illustration of the academic support being provided to Zunken is the proposed application of such a genetic algorithm to designing printed circuit boards capable of maintaining high signal integrity. (See Box 2)

This opens up the possibility of performing advanced design in an efficient and accurate manner with the use of AI, compared with the conventional approach of relying on the tacit knowledge of experienced personnel, and investing a great deal of time on design processes. Today’s manufacturing workplace is faced with a number of challenges, such as technology transfer difficulties due to the aging of experienced and skilled personnel, and human resource shortages. AI may prove indispensable for solving those problems. Zunken will continue to proactively incorporate various AI technologies into its solutions to contribute to solving the problems of manufacturing, as well as to addressing social issues.
Creating Tomorrow, Leading into the Future

Commercializing the Innovative Technology of Startups
Zuken’s Support for the Development of Retinal Scanning Laser Eyewear

Now that practical 3D printers have become more common and easy-to-use open-source hardware is available, the development of electronic products is no longer limited to major companies. The current environment enables smaller teams, even individuals, to develop prototypes of original products if they have innovative ideas and the latest technology. However, unlike prototyping to test product functions and usability, achieving commercialization for a mass audience of undefined size calls for overcoming certain technical challenges. While major companies have abundant resources and experience, many startups lack full-time technology support groups and resources, so achieving commercialization remains a major hurdle.

Established Technology Helps Commercialize Novel Technology

Recently, startups and individuals have been harnessing original technology and ideas to introduce novel products. We are seeing products that create original experiences not only in completely new fields, but also in markets regarded as mature, such as cooking appliances. This new manufacturing trend, fueled by hardware startups and the organizations and individuals who constitute the “maker culture,” has the potential to yield products that are unlikely to emerge from the product planning divisions of major companies, which generally focus on developing products for mass production.

However, activities that may be a matter of course for major companies could pose serious difficulties for many startups and individuals. For example, in order to bring a product to market, it must first satisfy tests and inspections related to compliance with safety standards. Achieving this is straightforward for companies with experienced teams of professionals; but for startups and individuals with limited resources, it can be a game-ender for commercialization plans. This translates into a loss for society. Zuken helps bridge this gap by using its technical resources and experience to support startups and individuals in turning their prototypes into marketable products.

One example is the support we provided to QD Laser, Inc., which develops, manufactures and sells high-performance semiconductor laser products. Their retinal scanning laser eyewear technology uses proprietary advanced laser technology to improve visual acuity for people with moderate to severe visual impairment.

Box 1 Retinal Scanning Laser Eyewear Technology

QD Laser has been working to refine the most advanced laser eyewear technology, including quantum dot laser technology. Industrial laser products have been the company’s core business since its establishment. “We want to make greater contributions to resolving social issues and advancing society with our semiconductor laser and light manipulation technologies,” says Dr. Mitsuru Sugawara, QD Laser President and CEO. Based on that desire, in 2013 QD Laser started developing a medical device using retinal scanning technology for displaying images by projecting laser light onto the retina. (See Box 2) This retinal scanning laser eyewear was described as “a miracle in a pair of eyeglasses” by the judges at CEATEC Japan 2016. The product could not have been developed without QD Laser’s advanced technology, but the developer faced a quandary in bringing it to market.

A miracle in a pair of eyeglasses

Judges describe QD Laser’s retinal scanning laser eyewear at CEATEC Japan 2016

Box 2 New VISIRIUM Technology for Projecting Images Directly onto the Retina

Faint light from RGB laser light sources is projected onto a MEMS mirror oscillating at high speed, creating scan lines as on a CRT television display. These images are reflected by a second mirror and projected onto the retina.

Contribute to Society Using Our Core Technologies

Living up to its motto, "Through light, the world is evolving," QD Laser has been working to refine the most advanced laser and optical technologies, including quantum dot laser technology. Industrial laser products have been the company’s core business since its establishment. "We want to make greater contributions to resolving social issues and advancing society with our semiconductor laser and light manipulation technologies," says Dr. Mitsuru Sugawara, QD Laser President and CEO. Based on that desire, in 2013 QD Laser started developing a medical device using retinal scanning technology for displaying images by projecting laser light onto the retina. (See Box 2) This retinal scanning laser eyewear was described as “a miracle in a pair of eyeglasses” by the judges at CEATEC Japan 2016. The product could not have been developed without QD Laser’s advanced technology, but the developer faced a quandary in bringing it to market.

We hope this product contributes to raising the quality of life for people with low vision.

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<thead>
<tr>
<th><strong>Company Name</strong></th>
<th>Zuken Inc.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Foundation</strong></td>
<td>December 17, 1976</td>
</tr>
<tr>
<td><strong>Head Office Location</strong></td>
<td>2-25-1, Edahigashi, Tsuzuki-ku, Yokohama, 224-8585 Japan</td>
</tr>
<tr>
<td><strong>Paid-in Capital</strong></td>
<td>JPY 10,117,065,000</td>
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<tr>
<td><strong>Number of Employees</strong></td>
<td>407 (consolidated: 1,267; as of the end of March 2018)</td>
</tr>
<tr>
<td><strong>Stock Listing</strong></td>
<td>Tokyo Stock Exchange, First Section</td>
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<tr>
<td><strong>Business Areas</strong></td>
<td>Research and development of a wide variety of software solutions that support the optimization of product design and engineering operations for manufacturing industries, and marketing of software solutions with expert consulting services.</td>
</tr>
</tbody>
</table>
| **Directors and Auditors** | Makoto Kaneko, President and Representative Director  
Jinya Katsube, COO and Representative Director  
Kazuhiro Kariya, Managing Director  
Yoshikazu Soma, Managing Director  
Takeo Osawa, Director  
Koichi Saotome, Director  
Takashi Sano, Director *  
Yoichi Arai, Director *  
Fusao Wada, Full-time Audit & Supervisory Board Member  
Yasushi Ozaki, Audit & Supervisory Board Member *  
Takashi Handa, Audit & Supervisory Board Member *  

* Outside director or outside audit & supervisory board member.